

E-Poster Abstracts

Diabetes in Pregnancy

ETHNIC VARIATIONS IN GLUCOSE, MATERNAL WEIGHT AND FETAL OVERGROWTH IN AN INNER CITY ANTENATAL COHORT

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Background and aims: The Hyperglycaemia and Adverse Outcomes in Pregnancy Study group clearly demonstrated a continuum between glucose and proportion of infants born large for gestational age (LGA: $\geq 90^{\text{th}}$ centile). We aimed to determine if this varied according to ethnicity. **Materials and Methods:** Pregnant women who underwent a 24-28 week 75g oral glucose tolerance test in an inner-city healthcare centre were retrospectively analysed (n=4562). Baseline maternal demographics, glycaemia and fetal birthweight/ birthweight centile were compared across five ethnic groups: White Caucasian (n=1379), Black African-Caribbean (n=591), South Asian (n=392), Mixed ethnicity/ any other Asian ethnicity (n=1499) and Other/ Ethnicity unknown (n=701). Variations in the proportion of LGA infants by category of glycaemia and body mass index (BMI) were examined. **Results:** Significant differences were observed in maternal demographics, glycaemia, fetal birthweight and birthweight centile across the groups. The proportion of infants born LGA increased with each increment in fasting plasma glucose (FPG) category in four of the ethnic groups but not in the Other/ Unknown group: variations in LGA incidence were significant. In contrast, no clear pattern emerged between 120-minute glucose values and LGA incidence: variations in LGA incidence were only significant in Black African-Caribbean and the Other/ Unknown ethnic groups. An overall trend towards an increasing proportion of LGA infants with each 5.0kg/m² increment in BMI was observed: variations in LGA incidence were only significant in women of White and Mixed/ Other Asian ethnicity. **Conclusions:** These data suggest that the impact of glucose and BMI on fetal overgrowth varies according to ethnicity.

COMPARATIVE STUDY ON MACROSCOPIC AND MICROSCOPIC FEATURES OF PLACENTAL IN OVERT DIABETIC PREGNANCY AND NORMAL PREGNANCY

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Introduction: About 1% of pregnancies are complicated with overt diabetes and may increase the risk of intrauterine fetal death. The purpose of this study was to investigate the macroscopic and microscopic features of placental villous maturation in pregnancies complicated with overt diabetes compared with normal pregnancies.

Materials & Methods: In this prospective study, 60 pregnant women with overt diabetes (case group) and 60 healthy pregnant women (control group) participated. Morphological characteristics of postnatal infant and their placenta were recorded and macroscopic and microscopic examination of the placenta was performed by Pathologist. Data were analyzed by using SPSS, version 11.5 and Chi Square and T Student tests. P value less than 0.05 was considered significant. **Results:** Difference in average weight between neonates of both groups was significant ($P = 0.000$), but the mean head circumference of neonates in two groups was not statistically significant ($P = 0.657$). Differences between two groups of placental diagonal ($P 0.001$), umbilical diameter ($P = 0.001$), placental hyaline changes ($P = 0.003$), placental vascular wall ($P 0.001$), placental infarction ($P 0.001$), poor placental maturation ($P 0.001$), vascular arthrosis ($P 0.001$) and intra villous hemorrhage ($P 0.001$) were significant. Shape of placenta, placental calcification, umbilical artery and villous without any artery had no significant differences between two groups. **Conclusion:** Diabetes had significant changes on placental villous delayed maturation.

GLYCEMIC VARIABILITY (GV) AND BIRTH WEIGHT IN GESTATIONAL DIABETES MELLITUS (GDM)

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Introduction Hyperglycemia in GDM is related with fetal macrosomia, as are obesity and excessive maternal weight gain during pregnancy. The relevance of GV in birth weight is not clear.

Objective To determine the relationship between GV and birth weight in pregnant women diagnosed of GDM.

Methods This prospective study included pregnant women with GDM followed in our hospital between January 2012 and June 2015. Patients were asked to test blood glucose four times a day (fasting and 1 hour postprandial) and data were directly downloaded from Accu-Check® Aviva glucometers. To analyze GV we considered the standard deviation (SD), the coefficient of variation (CV) and interquartile range (IQR). Birth weight and pregnancy and perinatal outcomes were studied. Results We included 310 pregnant women with GDM. Mean age was 34.1 ± 4.6 years, pre-pregnancy BMI was 26.8 ± 5.6 kg/m². GDM was diagnosed at 26.9 ± 6.0 weeks of gestation. Mean follow up was 57.5 ± 41 days and an average of 170.5 blood glucose measurements per patient were obtained. Mean birth weight was $3,222 \pm 461$ g. Median customized weight percentile was 51.6 ± 28.2 and 10.3% of the newborn were large for gestational age. SD, CV and IQR had a negative correlation ($r = -0.213$, $p = 0.005$; $r = -0.180$; $p = 0.019$; $r = -0.21$, $p = 0.007$) with birth weight in the group treated with insulin (54.8% of the women), showing no relationship in the group treated only with diet. When controlling for pre-pregnancy BMI and excessive weight gain during pregnancy, the correlation remained.

Conclusion:

Glycemic variability appears to be related to less birth weight in insulin-treated GDM.

EVALUATION OF FASTING PLASMA GLUCOSE AND THE IMPACT OF OBSTETRIC SURVEILLANCE ON MATERNO-FETAL OUTCOMES

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Objective: To evaluate the implications of new cut point for the fasting plasma glucose (FPG) to diagnosis Gestational Diabetes(GDM) in first prenatal visit and the impact of obstetric surveillance on materno-fetal outcomes. Nationwide retrospective study of women with GDM in Portuguese public hospitals between 2011 and 2015. We considered two groups: FPG 5.1-7mmol/l (group1)and FPG 5.1-5.3mmol/l (group2). In each group we evaluated the impact of early surveillance (24weeks)vs absence or late surveillance (24 weeks) on maternal-fetal outcomes. Results: A total of 8780 single pregnancies were included in study: 2870 in group1 and 1170 in group2. Early obstetric surveillance was initiated in 84% women in two groups. In both, maternal age was significantly higher among those started surveillance24 weeks (32.7±5.3vs32.0±5.8, p=0.024 G1; 32.5±5.3vs31.5±5.7,p=0.032 G2) and no significant differences were observed in nuliparity, previous GDM and macrosomia. The absence or late surveillance was associated to significantly higher proportion macrosomia (3.3%vs8.8%,p0.001 G1; 1.9%vs10.8%,p=0.000 G2), later delivery (38.3±1.8vs38.6±1.7 weeks, p=0.006 G1; 38.3±1.8vs38.8±1.5weeks,p=0.004 G2) and LGA (3.9%vs8.4%,p0.001 G1; 2.3%vs8.2%,p=0.000 G2) than in those with early surveillance in two groups. Even adjusted for maternal and gestational age, BMI pre-pregnancy and previous macrosomia, macrosomia was strongly associated with absence or late surveillance, [adjusted OR 3.0 IC95% (1.9-4.6),p=0.000 G1; adjusted OR 5.7 IC95% (2.7-11.9),p=0.000 G2]. In both groups, the beginning of surveillance had no impact in rate of caesarean section, prematurity, morbidity and mortality neonatal. Conclusion: Early diagnosis and surveillance is mainly associated with the reduction of macrosomia, with a greater reduction in the group with FPG5.3mmol/l.

LIFESTYLE FACTORS SUPPORTING DIETARY THERAPY IN PREGNANT JAPANESE WOMEN WITH DIABETES

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Purpose: The purpose of this study was to elucidate lifestyle factors that support dietary therapy in pregnant women with diabetes. Subjects and Methods: Subjects were Japanese women with diabetes as an underlying disease and who became pregnant and gave birth to a live infant. Semi-structured interviews were conducted with eight subjects between August and November 2010. The subjects' spoken data were arranged into similarities and differences, and the data were then qualitatively and inductively analyzed. Results: The categorization of the data of the eight subjects resulted in the extraction of four lifestyle factors that supported dietary therapy: adjustments to incorporate dietary therapy into one's lifestyle, feeling the presence of the child in one's womb, cooperative family members, and taking breaks.

Conclusions: In this study, as the women underwent physical changes such as morning sickness, exacerbated appetite, and weight increases associated with the progress of their pregnancies, they experienced difficulties in maintaining their dietary therapies. However, the results showed that certain factors in the women's lifestyles supported dietary therapy. Most pregnant women with diabetes in Japan receive outpatient treatment and recuperate in their normal living environment. Therefore, medical staff need to consider the individual lifestyles of such women and implement care strategies that can be followed in such settings.

SCREENING, DIAGNOSIS, TREATMENT AND FOLLOW-UP IN WOMEN WITH GESTATIONEL DIABETES MELLITUS(GDM). ORGANISATION IN THE REGION OF SOUTHERN DENMARK(RSD).

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Background: National Danish guidelines recommend selective screening for GDM in risk groups undergoing a 2-hour, 75 g oral glucose tolerance test (OGTT) with a current diagnostic 2-h threshold of 9.0 mmol/l (venous P-glucose/capillary B-glucose). Implementing new WHO criteria will increase GDM prevalence 2-3 fold. The Region of Southern Denmark (RSD) with 1.2 million inhabitants and 12.000 deliveries per year has one university hospital and three regional hospitals. We conducted a regional survey to study adherence to current guidelines and to identify organizational challenges for implementation of new GDM criteria. Aim: To study the local organization of GDM care in RSD. Methods: A questionnaire addressing management of GDM was answered by the four hospital teams. Results: Reported prevalence of GDM was 3-6 % and deliveries per year in each hospital varied from 1870-5000 (50-230 GDM patients; 5-20% of these insulin treated). All centres used venous P-glucose for diagnosis and OGTT's were performed in hospital laboratories. Patients were seen by the multidisciplinary GDM team within one week after diagnosis. Post-partum OGTT was arranged by the team in three of the centres whereas one centre referred the patients directly to their general practitioner. Overall, principles for diet- and insulin treatment, foetal ultrasound, timing of delivery, surveillance of the new-born and post-partum follow-up were in accordance with the national guideline. Conclusion: The organization of GDM management in RSD is in accordance with current national clinical guidelines and is uniform except from the post-partum follow up. This provides a solid basis for future changes.

DEMONSTRATING EFFECTIVENESS OF AN ANTENATAL CARE (ANC) BASED GESTATIONAL DIABETES MELLITUS (GDM) SCREENING IN MADHYA PRADESH, INDIA

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In India, rates of GDM are estimated to be 10-14.3%. As of 2010, there were an estimated 22 million women with diabetes & an additional 54 million women, between the ages of 20 and 39 with impaired glucose tolerance. To address the high need for GDM, in December 2014, Govt. of India developed a guideline on universal screening for "Diagnosis and Management of GDM". Method: Universal GDM testing among ANC women is implemented in 1 district of Madhya Pradesh, since Nov 2015, targeting about 24,000 pregnant women annually. The target population are pregnant women who come in contact with "Public Health System" for ANC services at facilities/community outreach. The interventions include training of the providers on screening, management and referral, ensuring logistics availability and establishing a data management system. The testing is done at first ANC

contact and repeated at 24-28 weeks gestation if the first test is negative. Results: Baseline assessment showed that Universal screening was not available and only 58% of facilities conducted random blood glucose on suspicion of risk. So, in effect a very minor proportion of women were screened for GDM in the targeted facilities. The effectiveness of universal screening will be evaluated by proportion of women screened for GDM during ANC, proportion of GDM positive women monitored for blood sugar and appropriately referred as well as availability of necessary logistics. The initial results are awaited. Conclusions: Demonstration of integration of GDM testing at ANC platforms provides opportunity to identify GDM positive cases for appropriate management.

GESTATIONAL DIABETES : SCREENING AND RISK FACTORS

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Background and aims: the recommendations of IADPSG give the possibility to choose whether the screening should be universal or selective based on risk factors assessment. The aim of our study was to assess the level of risk in our screened population, and the maternal-fetal morbidity associated with GDM depending on the presence or absence of risk factors. Materials and methods: we analyzed the data of all pregnant women admitted in day-hospital of diabetology during 30 months for screening for GDM. We conducted a systematic screening between 24 and 28 weeks of gestation by OGTT with 75g glucose (IADPSG criteria). We evaluated the frequency of risk-factors: Age \geq 35years, BMI \geq 25kg/m², history of diabetes in first degree relatives, previous GDM or macrosomic child. We compared the incidence of maternal and fetal complications between the groups with and without risk-factors (RF+/RF-) Results: of 1680 women screened, 330 had a GDM, an estimated prevalence of 19.6%. Among them 52(15.8%) showed no RF : average age 28.3years, mean BMI 23.6kg/m², 278(84.2%) had at least one RF : 128(46%) had age \geq 35years, 208(74%) BMI \geq 25kg/m², 139(50%) a history of GDM, 70(25%) a history of macrosomia and 35(12%), family history of diabetes. The maternal-fetal prognosis of the group (RF+) compared to the one with (RF-) only differs in macrosomia: 7.3% vs 15.6%(p 0.05). Conclusion: our population has a high prevalence of GDM. It is diagnosed in a non-negligible population without RF. There is no significant difference in the maternal-fetal morbidity between the two groups, so it seems appropriate to maintain a systematic screening

CONTINUED EXCESSIVE WEIGHT GAIN DURING GDM TREATMENT INCREASES THE LIKELIHOOD OF INSULIN INITIATION AND HAVING AN LGA INFANT

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Background: Women with Gestational Diabetes Mellitus (GDM) have commonly exceeded Institute of Medicine (IOM) weight gain targets by first presentation to diabetes services. Aim: Determine whether continued excessive gestational weight gain (cEGWG) is associated with greater likelihood of insulin initiation and Large-for-Gestational-Age (LGA) infants. Methods: Prospectively collected

(1992-2015) data from GDM pregnancies managed by Australasian Diabetes In Pregnancy Society guidelines were analysed. Women received two dietetic appointments, with weight measured at each 1-2 weekly multidisciplinary clinic visit. Inclusion criterion: exceeding IOM weight gain targets (according to self-reported pre-pregnancy BMI) at presentation: $\geq 18.1\text{kg}$ ($\text{BMI} \leq 18.5\text{kg/m}^2$); $\geq 16.1\text{kg}$ ($18.5\text{-}24.9\text{kg/m}^2$); $\geq 11.6\text{kg}$ ($25.0\text{-}29.9\text{kg/m}^2$); $\geq 9.1\text{kg}$ ($\geq 30.0\text{kg/m}^2$). cEGWG was assessed incrementally: $\leq 0\text{kg}$, $0.1\text{-}2\text{kg}$, $2.1\text{-}4.0\text{kg}$, $4.1\text{-}6.0\text{kg}$, $6.1\text{-}8.0\text{kg}$, 8.0kg . Exclusions: last recorded weight 4 weeks pre-delivery; managed for 3 weeks. cEGWG was included in multivariable logistic regression models adjusted for confounders predictive of insulin therapy and LGA. Outcomes: insulin therapy initiation, mean insulin dose and LGA rates. Results: Of 3345 pregnancies, 776 met criteria. Mean \pm SD: age 31.8 ± 5.6 years; GDM diagnosis 27.7 ± 4.2 weeks, pre-pregnancy BMI $29.2\pm 6.0\text{kg/m}^2$; weight gain at presentation $16.3\pm 5.0\text{kg}$; total maternal weight gain $18.0\pm 5.8\text{kg}$; weight gain during GDM treatment $1.7\pm 3.2\text{kg}$. cEGWG was an independent predictor of insulin initiation, higher mean insulin dose and LGA (all $p < 0.0001$). Incremental increases in cEGWG were associated with 24.7% (95%CI 11.0-40.1) and 30.4% (95%CI 16.8-45.7) increased likelihood of insulin initiation and LGA respectively.

Conclusions: cEGWG during GDM treatment was associated with a greater likelihood of insulin therapy initiation and having an LGA infant. Research evaluating strategies to minimise excessive weight gain are warranted.

HBA1C AND MATERNAL-FETAL OUTCOMES IN GESTATIONAL DIABETES

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Introduction: Self-monitoring of blood glucose is the standard method for assessing the glycemic profile in women with gestational diabetes mellitus (GDM). The goal is to normalize blood glucose and glycated hemoglobin (HbA1c) can be used as a complementary parameter. Aim: To evaluate the maternal-fetal outcomes in GDM according to HbA1c in the 3rd trimester of pregnancy. Methods: A cohort of 5271 Portuguese women from the National Registry of GDM was studied. Demographic, anthropometric and analytical data and maternal-fetal outcomes were evaluated. Results: Women presented a mean age of 33.14 ± 5.4 years, mean BMI of $26.99\pm 5.81\text{ kg/m}^2$ and mean weight gain during pregnancy of $9.63\pm 5.78\text{ kg}$. HbA1c in 3rd trimester was registered in 3546 women, being $\geq 5.7\%$ in 505 (14.2%). Women with $\text{HbA1c} \geq 5.7\%$ had a higher prevalence of pregnancy-induced hypertension (7.5% vs. 4.8%, OR=1.604, 95%CI=1.103-2.333, $p=0.013$), pre-eclampsia (3.8% vs. 2.0%, OR=1.978, 95%CI=1.169-3.347, $p=0.010$), hydramnios (6.1% vs. 3.0%, OR=2.055, 95%CI=1.344-3.140, $p=0.001$) and fetal death (1.2% vs. 0.3%, OR=3.634, 95%CI=1.315-10.043, $p=0.018$). Pregnancies with $\text{HbA1c} \geq 5.7\%$ had a possibility of cesarean section 1.5-fold higher (OR=1.497, 95%CI=1.233-1.819, $p < 0.001$) and a 4-fold increase in newborns large for gestational age (LGA) (9.6% vs. 2.6%, OR=3.906, 95%CI=2.657-5.742, $p < 0.001$). No significant differences were found regarding preterm birth, need for labor induction or urgent cesarean section, neonatal hypoglycemia, hyperbilirubinemia, respiratory distress syndrome, hospitalization in the Intensive Care Unit, congenital anomalies and neonatal death. Conclusion: Women with $\text{HbA1c} \geq 5.7\%$ in the 3rd trimester had more maternal complications, cesarean rate and LGA. Our results confirm the utility of HbA1c as a parameter for glycemic control evaluation in DGM.

PREGNANCY RISKS AND WOMEN'S FUTURE CARDIOVASCULAR HEALTH: A MISSED PRIMARY CARE OPPORTUNITY TO IMPROVE WOMEN'S HEALTH?

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Women with common pregnancy complications are more likely to develop early cardiovascular disease (CVD). Cardiovascular disease is the leading cause of death of Canadian women. This study aims to determine first whether pregnancy complications are captured in electronic medical records and second if a pregnancy risk is identified whether cardiovascular risk factors are identified to reduce future cardiovascular disease. **Methods and Results** A prospective cross sectional survey was sent to 2102 female patients (18 to 50 years) of the Sunnybrook Academic Family Health Team collecting information on socio-demographics, cardiovascular risks, pregnancy complications and postpartum follow-up. With 217 responses, 26% women experienced a pregnancy complication associated with increased CVD risk in keeping with current Ontario data. Gestational diabetes (26%), idiopathic preterm birth (25%), hypertensive disorders of pregnancy (35%) were the three most common complications experienced, with 4% experiencing GDM, HDP and preterm birth and 7% experiencing HDP and preterm birth. Among those with pregnancy complications, 70% indicated that their obstetrical care provider did not discuss future health concerns during their post-delivery visit. This represents a missed opportunity for primary prevention in a population known to be at risk for cardio-metabolic disease. **Conclusion and Future Steps** Most women identified at risk for CVD recalled no discussion of future health by their obstetrical care provider post-delivery. Further data from patient electronic medical records (EMR) will be extracted to determine whether pregnancy related CVD markers have been captured given that EMR's provide the opportunity to prompt providers to ask about pregnancy and implement primary prevention strategies.

EFFECT OF MODE OF INSULIN DELIVERY ON GLYCAEMIC CONTROL AND PREGNANCY OUTCOMES IN WOMEN WITH TYPE 1 DIABETES IN PREGNANCY

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Aims: Type 1 diabetes mellitus (T1 DM) in pregnancy is associated with increased rates of adverse obstetric and perinatal outcomes. We looked at pregnancy outcomes with continuous subcutaneous insulin infusion (CSII) compared to multiple daily injections (MDI) in women with type 1 diabetes. **Methods:** Retrospective study included pregnant T1 DM women from October 2015-2016 managed in multidisciplinary diabetes antenatal clinic at district general hospital, UK. Data collected from Medway Maternity ® including demographics, mode of insulin delivery, HbA1c, gestational age at delivery, fetal birth weight. **Results:** N=9 on MDI, n=6 on CSII (4 started in pregnancy). Median (± IQR) age (MDI vs CSII): 24 ± 10 vs 30 ± 4, BMI 24 ± 11 vs 26 ± 2.7. Indication for CSII: recurrent hypos and variability of glycaemic control. Median ± IQR HbA1c improved from pre-conception (MDI vs CSII) 8.8 ± 1.2 vs 7.8 ± 1.6 to HbA1c in 3rd trimester (MDI vs CSII) 7.1 ± 1.3 vs 7.3 ± 0.4. Median gestational age at delivery (MDI vs CSII) 37 vs 36 weeks (P=0.1) and birth weight 3445 ± 753 gm vs 3380 ± 1205 gm (p=0.5). Women on MDI: 1 miscarriage, 1 termination of pregnancy, 2 spontaneous vaginal deliveries, 5 elective C-section. Women on CSII: 1 miscarriage, 3 emergency C-sections, 2 elective C-sections.

Discussion: Women with T1DM treated with CSII and MDI achieved similar glycaemic control throughout pregnancy. There was no difference in maternal and fetal outcomes. Further research is needed as there is lack of evidence for CSII in pregnancy.

SCREENING FOR GESTATIONAL DIABETES-IMPLEMENTATION OF IADPSG IN A DISTRICT GENERAL HOSPITAL

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Aims: Gestational diabetes mellitus (GDM) is a common medical complication of pregnancy. GDM is associated with adverse outcomes in mother and baby. A retrospective audit in our department in 2014 against NICE NG3 showed that 40% of patients had late diagnosis of GDM. Methods: International association of the diabetes and pregnancy study groups criteria (IADPSG) for the diagnosis of GDM was implemented in Worthing Hospital in June 2016. We have looked at outcomes of pregnant women from June to December 2016 after implementation of IADPSG guidelines. Results: N=123 with GDM, 38/123 had previous GDM. Mean (\pm SD) maternal age was 32 ± 5.6 , BMI 29.4 ± 7.7 , 2hrs post loading glucose 9.1 ± 1.2 , Gestation at diagnosis 23 ± 10 weeks. 52/125 required treatment with metformin or in combination with insulin. Pharmacological intervention was started at 25 ± 8.6 weeks of gestation. 44 delivered spontaneously, 25 had elective C- sections, 6 emergency C-sections, 2 miscarriages and one termination of pregnancy. Mean (\pm SD) birth weight was 3339.7 ± 606.7 . 16 Patients would have been missed if only NICE NG3 criteria were being followed. These patients were diagnosed at 13.2 ± 3.5 weeks of gestation. 4/16 diet controlled, 4 on metformin, 4 on insulin, 2 on combination of metformin and insulin. Pharmacological intervention started at 18.7 ± 4.9 weeks of gestation.

Discussion: The implementation of IADPSG was associated with increase in early diagnosis of GDM. Pharmacological intervention was required in early pregnancy. We aim to look at fetomaternal outcomes in 2017.

CYSTIC FIBROSIS IN PREGNANCY-A DISTRICT GENERAL HOSPITAL EXPERIENCE

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21 years old, diagnosed with cystic fibrosis at 7 years of age. She had lung disease (baseline FEV1 of 77%), cystic fibrosis related diabetes, pancreatic insufficiency, ulcerative colitis, fixed length gastrostomy tube and Nissen's fundoplication in 1999. She has undergone 2 successful pregnancies in a district general hospital (DGH) in UK. Her first pregnancy was in 2012 and subsequently in 2016. In both her pregnancies, she was managed by joint diabetes antenatal team who co-ordinated care between DGH and tertiary centres. In her first pregnancy, her BMI was 17.5, under regular dietician review, on multivitamin supplementation, intermittently requiring feeding via gastrostomy tube which was changed to variable length in pregnancy. Her diabetes was well controlled on insulin. She was on flucloxacillin 1gm BD throughout her pregnancy for her chest with regular chest physiotherapy. She delivered by uncomplicated caesarean section at 31 weeks for acute relapse of ulcerative colitis followed by suspicious CTG. Baby's birth weight was 1920 gm. She was transferred to tertiary hospital due to lack of respiratory physiotherapy and cystic fibrosis dietary support.

In her second pregnancy she responded to steroids and then Vedolizumab infusion for flare up of her ulcerative colitis. Her diabetes was managed with insulin. She delivered locally by elective caesarean

section (31+6 weeks) due to ulcerative colitis flare up. Baby's birth weight was 1925 gm and needed neonatal admission for monitoring.

In summary, cystic fibrosis can be managed in DGH with close observation and tertiary support with a low threshold for transfer if required.

A SMARTPHONE APPLICATION FOR WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Gestational diabetes mellitus (GDM) is increasing among pregnant women worldwide. Measurement of blood glucose, physical activity and a healthy diet are essential components of care for women with GDM. We have developed the Pregnant+ app to promote health for women with GDM. We aim to investigate if the Pregnant+ app leads to better blood glucose levels than current standard care alone. GDM has consequences for women's and children's health in short and long-term. Women with GDM have an increased risk of induction of birth, caesarean section and preeclampsia. The majority of women with GDM recover once the pregnancy is over. However, they are in risk of developing type 2 diabetes.

Well-known risk factors for GDM are advanced maternal age, maternal obesity, family history of diabetes and previous history of GDM. Risks factors for the infant of mother with GDM includes fetal macrosomia, bone fracture and neonatal hypoglycemia. An infant of a mother with GDM may develop diabetes later in life. Time during clinic visits is restricted, thus other ways of communicating relevant information are essential. Apps may be a modern and appropriate way to supplement oral information. The Pregnant+ app provides women to automatically transfer their blood glucose values from the glucometer to their smartphone. This may help women to have an overview and thus maintain normal blood glucose values during pregnancy. The Pregnant+ app is customized for women speaking Norwegian, Somali or Urdu.

Our Pregnant+ app may enhance health of life for women and newborn.

GESTACIONAL DIABETES - EXPERIENCE OF TWO YEAR'S OF A TERCARY HOSPITAL

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Introduction: Gestational Diabetes (GD) is one of the major complications during pregnancy. The present study was carried out with the purpose of analyzing the characteristics of pregnant women with GD followed in the consultation of Diabetes and Pregnancy of the Hospital Prof. Doctor Fernando Fonseca (HFF), between January 2015 and December 2016. *Microsoft © Excel 2010* was used to do the statistical analysis. Results: The prevalence of women with GD and childbirth in our institution was 4.6%. Of the 278 pregnant women diagnosed with GD at our institution, only 266 remained in the consultation. The mean age of these pregnant was 33 years and mean BMI prior to diagnosis was

27.98 kg / m². 33 cases (12.2%) had a GD diagnosis in previous pregnancies. Most GD diagnosis occurred in second quarter (n= 157; 59%), however we made 77 (28.9%) diagnosis in the first quarter and 32 (12,1%) in third quarter. 54.5% (n= 142) required pharmacological therapy for metabolic control: 7 (2.63%) insulin, 93 (34.9%) metformin and 42 (15.9%) combination of both. The hydrohamium rate was 6% (n= 16) and fetal loss 1.5% (n = 4). More than 50% of deliveries occurred at term, with the preterm delivery rate being 20.2%. The majority of deliveries were eutocic (n = 133; 53,6%), with cesarean section being 35,5% (n=88). The NB weighing more than 4000g rate was 4,8% (n=12). Only 15.5% (n= 43) made reclassification of the DG, and none were diagnosed with *Mellitus Diabetes*. Conclusions: The prevalence of pregnant women with GD and delivery in our institution is low (4.6%), this is in agreement with the literature. The fact that our population presents low rates of macrosomia and pregnancy complications allow us to infer that our sample had a good metabolic control.

A MIXED MODEL OF GDM SCREENING AT ONE UNIVERSITY HOSPITAL IN ONTARIO CANADA AND THE IMPACT ON DIAGNOSIS

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A quality assurance audit was performed to examine our GDM screening practices. Diabetes Canada currently has two screening options in pregnancy with the two step test still being the preferred option . We provided education regarding GDM screening methods and caregivers were encouraged to order a one step test for women at the highest risk. Algorithms were provided. In our centre there is a weekly GDM class and our audit reviewed 200 consecutive women attending between 2015-2016. The incidence of GDM rose from 2.8 % at our centre in 2008 to 7.8 % in 2015. Prior to the clinical change the majority of patients had a two step test. The audit showed that 57% referred had a two step and 43% a one step test. The overall need for insulin was 23% and that is similar to a previous audit in 2008 (28%). Most women who had the one step test would have been positive by the previous thresholds. However 19 women were positive only by the HAPO criteria (10%) and 7 (37%) required insulin. The audit confirms that higher risk women diagnosed on a one step test had the highest insulin rate (33.7%). It is unclear if the increase in GDM is solely related to the one step test or to other demographic changes. The one step test is feasible at our centre. Utilization of a GDM class enabled our dietician resources to remain unchanged.

FETAL THIGH VOLUME AND ITS RELATIONSHIP WITH BIRTHWEIGHT IN WOMEN WITH GESTATIONAL DIABETES,

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Objective. To evaluate third trimester fetal thigh volume and its relationship with birthweight in women with gestational diabetes. **Material and Methods.** Prospective case-control study about women with normal pregnancies (n= 25) and women with gestational diabetes (n=25). Three dimensional fetal thigh volume was measured twice at third trimester of pregnancy (28, 32 and 36 weeks, Voluson 730 Expert, GE Healthcare). Mean fetal thigh volume was calculated in each gestational age using 4D View software. Demographic and perinatal data were recorded. Customized birthweight centile were calculated for our population. Comparisons between groups were performed by using the Student t test. The relationships between variables were analyzed using Pearson's correlation coefficient. **Results.** No significant differences were found in Fetal Thigh Volume between the studied groups

($p=0.001$) at any gestational age. In the control group there were no significant correlations between fetal thigh volume and birthweight centile. However, in the diabetic group there were significant correlations between fetal thigh volume and birthweight centile ($r=0.58$, $p=0.03$; $r=0.44$, $p=0.05$ and $r=0.54$, $p=0.01$; at 28, 32 y 36 respectively). Conclusions. Third trimester fetal thigh volume correlates with birthweight centile in women with gestational diabetes. Fetal thigh volume may be useful as a marker of fetal adiposity.

MATERNAL HYPERGLYCEMIA IN SINGLETON PREGNANCIES CONCEIVED BY *IN VITRO* FERTILIZATION MAY BE MODIFIED BY FIRST TRIMESTER BODY MASS INDEX

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Background: Previous studies have reported an elevated risk of gestational diabetes mellitus (GDM) in pregnancies conceived by *in vitro* fertilization (IVF), but to date confounding or effect modification by other risk factors has received little attention. We aim to determine if IVF is an independent risk factor for increased GDM risk and whether its effect is modified by maternal body mass index (BMI). **Methods:** 1089 (n=1013 spontaneous conception, n=76 IVF) women with singleton pregnancies from a Singaporean mother-offspring study (GUSTO) received a 75g oral glucose tolerance test (OGTT) at 26-28 weeks gestation. GDM diagnosis was based on World Health Organization 1999 criteria. **Results:** Women who conceived by IVF had an increased risk of GDM [OR=1.83 (95% CI 1.03 to 3.26)]. Their fasting and 2h blood glucose were 0.12 mmol/l (95% CI 0.00 to 0.24) and 0.64 mmol/l (95% CI 0.27 to 1.01) higher, respectively, than women who conceived spontaneously, after adjustment for maternal age, ethnicity, first-trimester BMI, family history of diabetes and previous history of GDM or delivery of a macrosomic (4kg) infant. We also observed an interaction between IVF and first-trimester body mass index (BMI) on GDM risk ($p=0.080$) and on fasting and 2h blood glucose levels ($p=0.001$ for both). GDM risk [OR= 3.54 (95% CI 1.44 to 8.72)] and blood glucose levels [fasting: +0.39 mmol/l (95% CI 0.13 to 0.65); 2h: +1.24 mmol/l (95% CI 0.56 to 1.91)] were significantly elevated in the IVF group, but only amongst overweight women (BMI $\geq 25\text{kg/m}^2$). **Conclusions:** IVF is associated with increased blood glucose levels and should be considered a risk factor for GDM, particularly in women who are overweight.

VERY TIGHT VERSUS TIGHT CONTROL: WHICH SHOULD BE THE CRITERIA FOR PHARMACOLOGIC THERAPY DOSE ADJUSTMENT IN DIABETES IN PREGNANCY? EVIDENCE FROM RANDOMIZED CONTROLLED TRIALS

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Objective: To analyze the criteria for dose adjustment of pharmacologic treatment for DM in pregnancy.

Methods of study selection: all trials of DM in pregnancy managed by oral hypoglycemic agents or insulin reporting criteria for pharmacologic therapy dose adjustment. RCTs in women with pregestational DM and gestational DM (GDM) were included. Results: Of 51 RCTs on therapy for GDM or pregestational DM, 17 (4,230 women) were included. Most of them (88%, 15/17) included women with GDM only. For RCTs including women with GDM, 12/16 (75%) used the two step approach. Regarding the type of initial therapy, 13 (77%) RCTs used different types and doses of insulin; 9 (53%) used metformin; 4 (24%) used glyburide; 1 (6%) used glybenclamide; and 1 (6%) used placebo. In most RCTs glucose monitoring was assessed four times daily. For fasting glucose target, all used a value 50%, 1 (6%) used 30%, and 1 (6%) used 20% of the values higher than the target value; while 1 (6%) used appearance of glycosuria. Conclusion: the most common criterium for diagnosis was the two step test, and the most common used therapies insulin and metformin. Regarding glucose monitoring, the most common frequency was four times per day, fasting and 2 hours after each main meal, using as target glucose values 95mg/dL and 120mg/dL, respectively. Importantly, we found six different criteria for pharmacologic GDM therapy dose adjustment, with the majority using very tight criteria of either 1 or 2 values per week higher than the target values, of which two thirds used only 1 value, and one third 2 values.

ARE WOMEN POSITIVE FOR THE ONE STEP BUT NEGATIVE FOR THE TWO STEP SCREENING TESTS FOR GESTATIONAL DIABETES AT HIGHER RISK FOR ADVERSE OUTCOMES?

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Objective: To evaluate if women meeting criteria for GDM by IADPSG criteria but not by other less strict criteria have adverse pregnancy outcomes compared to GDM negative controls. Data sources: Electronic databases were searched from their inception until January 2017. Methods of study selection: We included all studies identifying pregnant women negative at the Two Step test, but positive for IADPSG criteria. We excluded studies that randomized women to the One Step versus the Two Step tests; studies that compared different criteria within the same screening method; randomized studies comparing treatments for GDM; studies comparing mainly incidence of GDM in women doing

the One Step test versus other women doing the Two Step test; and studies not reporting clinical outcomes. Results: All 8 included studies were retrospective cohort studies. We defined 5 study groups and 4 control groups and we compared outcomes in any study group to any control group. No one study evaluated if treatment of women IADPSG criteria positive but negative by other less strict criteria has an effect on adverse pregnancy outcomes. Macrosomia was more common in women positive on 75g IADPSG criteria but CDA-criteria negative, and positive on 75g IADPSG criteria but NICE criteria negative, while was less common in women positive for 100g IADPSG criteria, but negative on C&C criteria, compared to IADPSG negative women. Other main outcomes were more common in study groups rather than in control groups. Conclusion: Despite continuing controversy regarding if the One Step test or the Two Step tests should be used for GDM screening, we identified no study which evaluated if treatment of women meeting criteria for GDM by IADPSG criteria (One Step test) but not by other less strict criteria has an effect on adverse pregnancy outcomes compared to no treatment. More strict criteria for GDM screening could identify women at high risk and prevent adverse pregnancy outcomes.

ONE STEP VERSUS TWO STEP TESTS FOR GESTATIONAL DIABETES SCREENING: SYSTEMATIC REVIEW AND META-ANALYSIS OF THE RANDOMIZED TRIALS

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Objective: To assess both the prevalence of GDM by the one-step and the two-step methods and to compare the maternal and neonatal outcomes. Data Sources: Electronic databases were searched from their inception until January 2017. Study eligibility criteria: We included all randomized controlled trials (RCTs) comparing the one-step with the two-step methods for the screening and diagnosis of GDM. Results: 3 RCTs (2,301 women) were included as they compared the one-step with the two-step methods for the screening and diagnosis of GDM. In each one there are a study group undergoing One-step 75 g test and a control group undergoing Two-step 100 g test. Regarding GDM rate, 2 RCTs reveal an incidence more than double in the study group respect to control group (14.5% vs 6%; 4.3% vs 0.0%), while in one RCT there are no differences (3.6% vs 3.7%). Maternal and neonatal outcomes have been analyzed only in 2 studies. Sevket's RCT reveals that women GDM-negative by IADPSG had better perinatal outcomes than women GCT-negative and women GCT-positive with a negative OGTT; Scifres' RCT concludes that rates of macrosomia, cesarean delivery, and pregnancy-induced hypertension were also similar between groups. Not all our outcomes were studied in selected RCTs. GDM rate was 8.4% in women screened with One step approach, 4.6% in women screened with Two step method (OR 1.74, CI 95% 1.21 to 2.52). This was the only statistically significant result that we obtained. Regarding cost-effectiveness, only one RCT reported this analysis. Conclusion: Despite continuing controversy regarding if the One Step test or the Two Step tests should be used for GDM screening, we didn't find enough data in literature. Only well designed RCTs comparing One-step versus Two-step approach including huge populations could answer to this question.

WHICH CRITERIA SHOULD BE USED FOR STARTING PHARMACOLOGIC THERAPY IN GESTATIONAL DIABETES IN PREGNANCY? EVIDENCE FROM RANDOMIZED CONTROLLED TRIALS

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Objective: To analyze the criteria for starting pharmacologic treatment for patients with GDM. **Data sources:** electronic databased were searched from their inception to December 2016. **Methods of study selection:** Selection criteria included all randomized controlled trials (RCTs) of GDM managed initially by diet and exercise reporting criteria for starting pharmacologic therapy with either oral hypoglycemic agents or insulin. RCTs in women with pregestational diabetes were excluded. For each trial, data regarding glucose values used for starting pharmacologic therapy were extracted and carefully reviewed. **Results:** Of 51 RCTs on therapy for diabetes in pregnancy, 15 (4,307 women) were included as they considered GDM only and reported criteria for starting pharmacologic therapy. Two diagnostic tests were used: 8/15 (53%) used the one step approach; 6 (40%) used the two step approach; 1 (7%) used either the one or two step approach. Regarding the type of initial non-pharmacologic treatment, 15 RCTs (100%) reported a new diet was recommended, while 4 RCTs (27%) reported that exercise was recommended. In most RCTs glucose monitoring was assessed four times daily, i.e. fasting (14 RCTs, 93%) and 2 hours (10 RCTs, 67%) after each of the three main meals – breakfast, lunch, and dinner. For fasting glucose target, all used a value 50% and 1 (7%) used as criteria 30% of the values higher than the target value. **Conclusion:** When evaluating RCTs which included criteria for starting pharmacologic therapy in women with GDM, the most common criteria for diagnosis was the one step test. Regarding glucose monitoring, the most common frequency was four times per day, fasting and 2 hours after each main meal, using as target glucose values 90mg/dL and 120mg/dL, respectively. Importantly, we found seven different criteria for starting pharmacologic therapy, with the vast majority (87%) using very tight criteria of either 1 or 2 values 1 or 2-week period higher than the target values, of which more than 50% used 2 values.

RETINOPATHY SCREENING AND FOLLOW UP, OF PREGNANT WOMEN WITH TYPE 1 AND TYPE 2 DM, IN A COMMUNITY HOSPITAL IN QATAR

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OBJECTIVES: Audit against the following standards: Diabetes in Pregnancy, HMC clinical guideline. Concerning retinopathy screening in pregnant women with pre-existing diabetes.

Pregnancy enhances the progression of diabetic retinopathy, which might results in significant vision impairment.

All women with pre-existing diabetes should undergo a retinal assessment in the first trimester and at 28 weeks.

METHODS: 9 month retrospective study of the Joint Obstetric Diabetic Clinic patients in Al-Wakra Hospital, for diabetic retinopathy screening in pregnant women with Type I and Type II DM. 292 patients were reviewed. 46 with pre-existing (Type 1 and Type 2) DM, who completed their ANC in JODC. Data has been retrieved from the electronic medical records (CERNER). **RESULTS OF THE STUDY:** Out of the 46 patients: 5 (10.8%) patient with type 1 DM, 41 (89.2%) patients with type 2 DM. 39 (84.7 %) Patients were referred for retinopathy screening, 31 (67.3 % of all patients, 79.4% of patients who have been referred) seen and examined (8 patients (20.6%) did not follow their referral). All patients who screened had no evidence of diabetic retinopathy. Out of the 31 patient who screened, 13 patients (41.9%) did not attend for follow up screening. **INTERPRETATION OF THE RESULTS AND CONCLUSION:** Total number of deliveries in the hospital is 5128. DM rate in pregnancy is 23%. Normal results of retinopathy screening , is a reflection of the short duration of diabetes in the screened patients and that majority are of young age group. Average time between referral and ophthalmology visit is 3.84 weeks. Average period of type 2 DM is 4.2 years. Awareness for both, patients and medical practitioners, should be raised about the importance of retinopathy screening in pregnant women pre-existing diabetes.

ASSOCIATION OF FREE FATTY ACID COMPOSITION WITH INSULIN RESISTANCE AND INSULIN SECRETION IN HEALTHY PREGNANT WOMEN

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Previous studies showed that acute elevation in plasma total free fatty acids (FFAs) level causes an increase in insulin resistance (IR) during pregnancy. We examined associations of maternal plasma FFA composition with markers of IR and insulin secretion in healthy pregnant women during early gestation (week 16). Data were from a large prospective cohort study - the Camden study of minority pregnant women (n=1,562, African-American 37%, Hispanic 49%, Caucasian 14%, age 21.9±5.2 yr., pre-pregnancy BMI 25.6±6.1 kg/m²). Plasma FFAs composition were analyzed by GCMS. Serum insulin, C-peptide, plasma glucose concentrations were determined by radioimmunoassay and/or enzymatic assays. Multiple regression analyses were performed. Separate models were fit for each individual FFA. Palmitic acid, dihomo- γ -linolenic acid (DGLA), stearic acid and arachidonic acid (expressed as percentage of total FFA) were significantly positively associated with insulin, C-peptide, glucose and homeostatic model assessment for IR (HOMA IR) (log transformed, p0.01 to p0.0001). Similar relations were observed in eicosapentaenoic (EPA) and docosahexaenoic acids (DHA). In contrast, palmitoleic acid, oleic acid and linolenic acid were inversely associated with insulin, C-peptide, glucose and HOMA IR (p0.01 to p0.0001). These data suggested that maternal FFA composition especially the functional long-chain FFAs can contribute to the development of insulin resistance commonly observed during late pregnancy as well as in gestational diabetes mellitus.

DELAYED LACTOGENESIS II IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Background: Breastfeeding is especially beneficial for maternal-infant dyads affected by gestational diabetes mellitus (GDM), although women with GDM often have lower breastfeeding rates and face more challenges with early breastfeeding than women without diabetes. There is a paucity of information regarding the effect of GDM on the metabolite composition of colostrum. The metabolite concentrations of lactose and citrate indicate the transition to increased milk production. **Objective:** A primary objective of the study was to compare colostrum metabolite levels of women with and without GDM. **Methods:** A prospective case-control pilot study of 50 postpartum women with and without GDM was conducted to examine differences in colostrum metabolite levels using enzymatic methods and compare with maternal perception of transition to lactogenesis II. **Results:** Composition analyses revealed significantly lower concentrations of specific metabolites at 72 hours postpartum in colostrum samples of women with GDM compared to non-diabetic women: glucose μM (5.8 ± 0.6 versus 6.3 ± 0.8 , $p=0.027$), lactose mM (142.4 ± 49.8 versus 176.7 ± 38.9 , $p=0.012$), citrate mM (3.3 ± 1.6 versus 5.2 ± 1.5 , $p=0.005$), and glucose-6-phosphate μM (4.2 ± 0.6 versus 4.5 ± 0.5 , $p=0.037$). A higher proportion of women with GDM reported perceived delayed secretory activation, also called delayed lactogenesis II.

Conclusions: Lower levels of colostrum lactose, glucose, and citrate among women with GDM compared to those without GDM indicate delayed secretory activation with GDM which may suggest a biological mechanism associated with lower breastfeeding rates among women with GDM. Maternal report of delayed secretory activation among women with GDM is validated by identifying colostrum metabolite concentrations.

SEASONAL PATTERN IN THE DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS IN SOUTHERN SWEDEN

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Background and aims: While seasonality in the onset of type-1 diabetes is well documented, less is known about the seasonality in the diagnosis of type-2 diabetes and gestational diabetes (GDM). The aim of this study was to examine seasonal pattern in glucose tolerance and in the diagnosis of GDM. **Material and methods:** Altogether, 11 538 women underwent a universally applied 75-g oral glucose tolerance test (OGTT) in the twenty-eighth week of pregnancy during the years 2003–2005 in southern Sweden. GDM was defined by the 2-h capillary glucose concentration in the OGTT according to 1999 WHO criteria. Chi-squared test, analysis of variance, and logistic and linear regression analyses were used for statistical evaluations. **Results:** The monthly frequency of GDM ranged from 2.9% in March to 5.8% in June ($p=0.01$), while the seasonal frequency ranged from 3.3% in spring to 5.5% in summer ($p<0.0001$). Mean 2-h glucose concentrations followed the same seasonal trend with a difference of 0.15 mmol/L between winter and summer ($p<0.0001$). The 2-h glucose level increased by 0.009 mmol/L for every degree increase in temperature ($p<0.001$). In regression analysis, summer (June–August) was associated with increased 2-h glucose level ($p<0.001$) and increased frequency of GDM compared to the other seasons (OR 1.51, 95% CI 1.24–1.83, $p<0.001$). **Conclusion:** Our findings suggest that there was seasonal variation in the 2-h glucose concentration in the OGTT and in the proportion of women diagnosed with GDM, with a peak in the summer that was possibly related to the higher ambient temperature.

EXPERIMENTAL DIABETES IMPAIRS MORPHOMETRIC, BIOCHEMICAL AND OXIDATIVE OUTCOMES IN THE MATERNAL ORGANISM AND THEIR OFFSPRING

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The aim was to investigate repercussions of neonatally-induced mild diabetes on the maternal organism and their offspring. Experimental diabetes model was generated by neonatal streptozotocin administration. At birth, female Wistar rats were assigned either to control or to diabetic group (100mg of streptozotocin/Kg bw/sc). At adulthood, the female rats were mated. At term, maternal and fetal blood sample was collected for biochemical measurement. The maternal livers, fetal livers and placenta were removed for oxidative stress measurements. Maternal reproductive outcomes, fetal and placental morphometric measurements were analyzed. The fetuses were classified as small, appropriate and large for pregnancy age, and examined for the presence of external anomalies. Neonatal STZ-induced mild diabetic dams showed mild hyperglycemia, altered glucose tolerance and increased lipid profile and HbA1c during pregnancy. At 20 days of gestation the diabetic mothers presented increased reabsorptions and embryonic losses before and after the implantation process, reduced corpora lutea number, litter size, implantation sites, live fetuses and decreased efficiency of implantation rate. Likewise, the offspring showed reduced fetal, craniofacial and placental dimensions in addition higher proportion of small fetuses for pregnancy age. Mild hyperglycemia during pregnancy not generated a marked oxidative stress in the mother, and in fetal liver and placenta decreased antioxidant activity is evident by significant consumption of GSH. This experimental model of mild diabetes during pregnancy reproduced maternal and fetal outcomes of women with controlled clinical pregestational diabetes and may prove useful to identify mechanisms involved and to test new intervention strategies in human diabetic pregnancy.

EFFECT OF ZINC SUPPLEMENTATION ON THE MATERNAL–FETAL OUTCOME, BIOCHEMICAL MARKERS AND ESSENTIAL ELEMENT LEVELS OF STREPTOZOTOCIN-INDUCED MILD DIABETIC RATS

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Objective: To evaluate the effects of zinc supplementation on disturbed mother's reproductive parameters, offspring's somatic growth, biochemical markers and essential element levels in non-diabetic and streptozotocin-induced mild diabetic rats. Methodology: Non-diabetic pregnancy rats and pregnancy rats with neonatal streptozotocin-induced mild diabetes were divided into groups: C: Control, C-Zn: Control-Zinc-supplemented, D: Diabetic, D-Zn: Diabetic-Zinc-supplemented. A Zn-supplement (ZnSO₄-Dose-50mg/kg) was orally administered throughout pregnancy. Glucose test tolerance (GTT) was performed at day 18 of pregnancy. At term pregnancy, maternal reproductive outcomes and fetal development parameters were studied. In addition, maternal biochemical markers and maternal and placental zinc (Zn), copper (Cu), iron (Fe), magnesium (Mg), and calcium (Ca) status were also investigated. Results: Zn Supplementation during pregnancy: -improved glycemic levels (GTT) and HbA1c in diabetic rats; -decreased the proportion of post-implantation loss and reabsorptions in diabetic rats; -lowered the number of fetuses classified as small for pregnancy age in diabetic rats; -caused reduced triglycerides levels and no changes in cholesterol and VLDL levels in

diabetic rats;-improved excessive accumulation of Cu in the maternal livers and kidneys and increased the maternal liver Zn concentration in diabetic rats; produced no change in altered placenta Zn concentrations in diabetic rats and did not interfere with other essential elements evaluated in maternal tissues and placentas. Conclusion: Zn-supplementation had hypoglycemic effect and improved lipid anomalies in diabetic mothers, as well as modified the levels of some essential elements in maternal tissues and placentas, contributing to improve intrauterine development and fetal growth in dams diabetic.

LOW SIALIC EPO AMELIORATES GLUCOSE HOMEOSTASIS AND PROTECTS EMBRYONIC DEVELOPMENT IN DIABETIC PREGNANT RATS

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Recently, Erythropoietin (EPO) has been found to regulate survival and cyto-protection of different cells types. The aim of this study was to evaluate the effect of low sialic EPO (lsEPO) in embryonic development and glucose homeostasis in diabetic pregnant rats. Female rats were injected with Streptozotocin (60 mg/Kg B.W.) to induce diabetes. Two weeks after diabetes diagnosis, rats were paired with healthy males. Once the pregnancy was diagnosed rats were injected with lsEPO or placebo on days 0, 2, 4, 6, 8 and 10 of pregnancy. Healthy female rats were used as negative control. Pregnancy was interrupted at day 12 to evaluate the product. Our results show a significant increase of reabsorption and early pregnancy loss in diabetic rats treated with placebo when compared to control. These rats has a risk 1.37 fold higher. On the other hand, the diabetic rats treated with lsEPO show a decrease of reabsorption and early pregnancy loss when compared with those treated with placebo, with a risk of 0.8 fold lower. The Glycaemia was lower in diabetic rats treated with lsEPO than in those treated with placebo. The decrease was detected as early as day 6 of treatment and was higher at day 12 when diabetic rats treated with placebo show a glycaemia of 24.14 mM/L while those treated with lsEPO had 17.92mM/L. In conclusion, these results show that lsEPO ameliorate glucose homeostasis in diabetic pregnant rats and it is the first report of the protection of embryonic development in diabetic pregnant rats.

EXPLORING GENE EXPRESSION IN THE PLACENTAL TISSUE OF DIABETIC PREGNANT RATS UNDER TREATMENT WITH EPO

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The identification of EPOR expression on different cell types had shown their non erythropoietic effects like we can see on immune cells, reproductive system, endothelial cells, pancreas and so on. With the objective to investigate on the effects on embryonic development, diabetic pregnant rats were treated with modified EPO (low sialic acid composition) by intra-peritoneal way in alternated days from the beginning of pregnancy until 11.5 gestational days. At that day, pregnant rats were sacrificed, embryos extracted and morphologically analyzed. The decidua tissue was used for genetic studies. We specifically studied the expression of some genes that are very active in the early stages of embryonic development like NFE2L2, HIF1A, VEGFA, BAX, INOS and BCL2. Results show that relative expression of BCL2 was positively regulated and no other genes were modified in those tissues. Strikingly, offspring of diabetic rats under Epo treatment suffered less malformations and less loss. It is known that Epo has an important role in the apoptotic pathway and control crucial processes at

specific moments of embryo development. The placental formation is a challenge on diabetic pregnant rats. The implication that these changes could have in the development of the embryo is yet to demonstrate.

THE SIGNIFICANCE OF PROPER PREPARATION OF PREGNANT WOMEN FOR TESTING FASTING BLOOD GLUCOSE AND THE ORAL GLUCOSE TOLERANCE TEST

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INTRODUCTION: According to the diagnostic criteria by the IADPSG, the diagnosis of GDM can be made in women with fasting plasma glucose ≥ 5.1 mmol/L, but 7.0 mmol/L at any gestational age. Pregnant women are advised to eat a balanced diet that contains at least 150g of carbohydrates for 3 days before the test and not to eat at least 8 hours prior to the test. **PROBLEM:** By targeted history taking we encountered a problem relating to inadequate preparation for the FBG test. Every pregnant woman with suspected of having GDM without any adequate preparation for the test, was referred to take the 75g OGTT in order to confirm the diagnosis. **RESULTS:** In 287 (31%) of 910 pregnant women with the mean age of 31.4 years, who were referred to the diabetes outpatient clinic with suspected GDM by their OBGYN in 2014–2015, the diagnosis was not confirmed. The performed measures included consultation, non-pharmacological treatment methods, and control 75g OGTT between weeks 24 and 26 resulted in 12 new GDM, which is only 5.20%. 92 (14.70%) of 623 pregnant women with GDM were treated with insulin and regulated by a diabetologist. **CONCLUSION:** In 31% pregnant women, the diagnosis was not confirmed because due to inadequate preparation. To confirm GDM, every pregnant woman should receive clear instructions before taking the FBG diagnostic test and the 75g OGTT. This is to avoid high and unnecessary costs caused by duplicating laboratory tests and prescription of self-monitoring kits and not needlessly exposed to related stress.

POOR ADHERENCE TO AND RELIABILITY OF SELF-MONITORED BLOOD GLUCOSE IN WOMEN WITH GESTATIONAL DIABETES MELLITUS ARE USUAL AND ASSOCIATED WITH POOR OUTCOMES.

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Aims: to evaluate adherence to self-monitored blood glucose (SMBG) and reliability of blood glucose diary records in women with gestational diabetes mellitus (GDM), their determinants and prognosis.

Methods: We prospectively selected women with newly-diagnosed GDM who were referred to our diabetes management program, spoke national language and had understood glycaemic SMBG techniques and goals. During the first follow-up visit, we collected SMBG results from glucometers and diary records. We analyzed pregnancy outcomes.

Results: Data were analyzed over 13 ± 3 days in 91 women. Only 61.5% of subjects had performed 80% of required measurements. Poor adherence was associated with family history of diabetes, social deprivation and non-European origin. Average delay between pre- and post-prandial measurements was 131 ± 26 minutes; with 46.5% of women performing 80% of post-prandial measurements 100-140 minutes after meals. An inadequate delay was associated with origin and a higher HbA1c at inclusion (5.3 ± 0.5 vs $5.1 \pm 0.4\%$, $p=0.03$). A poor concordance (23.1% of women had 90% matched values in diary and meter memory) was associated with familial history of diabetes; 9.9% women underestimated glucose values or did not report a high glucose value more than three times a week. Poor adherence was associated with more preeclampsia (12.2 vs 1.9%, $p=0.049$) and inadequate post-

prandial delay with a high HbA1c at delivery (5.3 ± 0.4 vs $5.0\pm 0.3\%$, $p0.01$), despite a higher rate of insulin therapy.

Conclusion: although women with GDM are considered as highly motivated, SMBG adherence and reliability are of concern and associated with poor prognosis.

EFFECT OF EXERCISE MODALITY ON MARKERS OF INSULIN SENSITIVITY AND BLOOD GLUCOSE CONTROL IN PREGNANCIES COMPLICATED WITH GESTATIONAL DIABETES MELLITUS: A SYSTEMATIC REVIEW

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Background: Exercise can be used as a strategy to attenuate hyperglycaemia experienced during gestational diabetes mellitus (GDM). To maximise its use for clinical management, the most effective modality should be identified. The purpose of this review is to elucidate the most effective modality of exercise on insulin sensitivity and blood glucose control in pregnant woman with or at risk of GDM. Methods: A search was undertaken in MEDLINE, PUBMED, Scopus, CINAHL, Cochrane library, EMBASE and Maternity & Infant Healthcare Database. Inclusion criteria were RCT and case-controlled studies, which compared exercise interventions to standard care during pregnancy, in woman with or at risk of GDM. Results: Two interventions using resistance-training and five using aerobic-exercise were included. The interventions showed consistently that requirement of insulin therapy; dosage and latency to administration, were improved in the exercise groups. Less consistent results were observed for capillary blood-glucose measurements; however both modalities were effective at improving blood-glucose control. Discrepancies in the timing of intervention, GDM diagnostic criteria and the different measures used to assess glucose metabolism make it difficult to draw clear recommendations. Conclusion: Further studies looking specifically at the effects of different modalities of exercise on glucose metabolism with combined strategies to enhance insulin sensitivity should be explored to maximise benefits for GDM pregnancies. Consistency in design and delivery of exercise-only interventions is required to make recommendation on suitable exercise prescription in this population. In practice, adherence to consensus in diagnostic cut-offs for GDM diagnosis is fundamental for standardising future research.

MATERNAL SUBCUTANEOUS AND VISCERAL ADIPOSE ULTRASOUND THICKNESS IN WOMEN WITH GESTATIONAL DIABETES MELLITUS AT 24-28 WEEKS' GESTATION

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Objective: To compare the sonographic measurement of maternal subcutaneous and visceral adipose thickness between pregnant women with gestational diabetes mellitus (GDM) and patients with non-diabetic pregnancies. **Methods:** Adipose thickness was measured by transabdominal ultrasound in pregnant women attending antenatal clinics at 24-28 weeks' gestation. The subcutaneous adipose thickness was measured as the maximum vertical distance from the skin line to the anterior edge of the linea alba, and the visceral adipose thickness from the posterior edge of the linea alba to the anterior surface of the left liver's lobe. All patients underwent a 75g oral glucose challenge as a diagnostic test for GDM. Logistic regression analysis was used to determine the variables that were significantly associated with GDM. **Results:** The study population comprised 56 women with a positive glucose challenge test and 112 non-diabetic pregnancies. Measurements of subcutaneous and visceral adipose tissues were converted into multiples of the median (MoM), adjusted for gestational age. The mean MoM subcutaneous thickness was significantly different between patients with GDM and with non-diabetic pregnancies (1.31 vs. 1.07, respectively; $p=0.011$). Similarly, the mean MoM visceral thickness was significantly higher in women with GDM (1.61 vs. 1.03, $p0.001$). Multiple logistic regression analysis demonstrated that visceral adipose thickness, but not subcutaneous thickness, was significantly and independently associated with GDM (OR 34.1, 95% CI 9.5–122.2). **Conclusions:** Sonographic thickness of maternal visceral adipose tissue at 24-28 weeks' gestation was higher in women with GDM compared to non-diabetic, independently from other known risk factors associated with GDM.

A RETROSPECTIVE COHORT STUDY TO COMPARE PREGNANCY OUTCOMES IN TEENAGE VERSUS ADULT PATIENTS WITH TYPE 1 INSULIN DEPENDENT DIABETES MELLITUS (T1D).

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OBJECTIVE: To assess glycemic control achieved in teenage pregnancies complicated by T1D compared to adults with T1D. The secondary objective was to compare the risk of adverse pregnancy outcomes. **METHODS:** This was a retrospective cohort chart review encompassing an eight-year span from 2007-2015. Two cohorts of pregnant women with T1D were compared: teenagers (age 13-19) and adults (age 20-39). **RESULTS:** Teenagers entered pregnancy with a significantly higher HbA1c (9% versus 7.8%, $p0.01$) but achieved a more dramatic decrease ending with similar HbA1c levels as adults prior to delivery (7.2% versus 6.9%, $p=0.06$). Both groups had similar starting total daily insulin doses and a similar increase in insulin resistance (~30%) as pregnancy progressed. Teenagers were less likely to have preconception counseling and a smaller proportion were using insulin pumps at conception (27.9% versus 47.2%, $p0.01$). Since teenagers were more likely to initiate pumps during pregnancy, rates of insulin pump use at delivery were similar. Adults entered pregnancy with significantly more comorbidities, however obstetric and neonatal outcomes in both groups were similar. **CONCLUSION:**

Our data supports our hypothesis that teenagers with T1D enter pregnancy with poorer glycemic control but, with intensive management they are able to achieve greater improvement and ultimately achieve similar glycemic control as adults with T1D. Unlike other published research, our data suggests that with intensive DM management, teenagers and adults with pregnancies complicated by T1D have comparable pregnancy outcomes.

PLASMA LEVELS OF SOLUBLE FAS ARE INCREASED IN WOMEN WITH GESTATIONAL DIABETES, BUT NOT CORRELATED TO PLACENTAL WEIGHT

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Background/h2 The membrane bound FAS receptor is a key component of the extrinsic apoptosis pathway. Alternative splicing of the FAS gene generates in a soluble form of FAS (sFAS), which may protect cells against apoptosis due to competitive binding of the FAS ligand. A study has found decreased placental FAS expression and increased placental weight in women with gestational diabetes mellitus (GDM). The aim with this study was to compare plasma levels of sFAS in pregnant women with or without GDM and investigate the possible impact on placental weight. **Methods/h2** Pregnant women were diagnosed with GDM after a 2-hour, 75g oral glucose tolerance test at Skåne University Hospital, Lund, Sweden 2010-2014 (n=325). Pregnant women without GDM were recruited from health centres in the same region 2014-2015 to act as controls (n=322). Maternal plasma levels of sFAS were analysed with commercial ELISA kits. **Results/h2** Plasma levels of sFAS were significantly higher in women with GDM (1610 [1195-2196]pg/ml) compared to controls (1259 [894-1745]pg/ml) (p<0.0001). sFAS correlated to BMI ($r_s=0.14$, p=0.0006), but not to maternal age, C-peptide, HbA1c or placental weight. Placental weight was increased in GDM women who received insulin treatment during their pregnancy (607±130g) compared to those who did not (670±152g) (p=0.0004). **Discussion/h2** This is the first study to show significantly increased levels of sFAS in GDM. No association between maternal plasma levels of sFAS and placental weight could be observed. This suggests that the placenta is not the source of the increased levels of sFAS and calls for further studies.

THE IMPACT OF THE IADPSG DIAGNOSTIC CRITERIA ON THE PREVALENCE OF GDM COMPARED TO NICE CRITERIA

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Objective. To investigate the impact of the International Association of Diabetic Pregnancy Study Group (IADPSG) diagnostic criteria on the prevalence of gestational diabetes mellitus (GDM) and OD (overt diabetes) compared to the UK's National Institute for Health and Care Excellence criteria (NICE) and to evaluate the frequency of obese women, cesarean deliveries, hypertensive disorders in the pregnant cohort with FPG levels 5.1-5.5mmol/l. **Methods.** A retrospective observational study was undertaken at Department of Obstetrics and Gynecology Hospital Medical Center Zagreb, Croatia, from January 1, 2012 to December 31, 2014. **Results.** Data from 4,646 women who underwent diagnostic 2 hour OGTT were obtained. According to the NICE criteria 17.8% women had GDM and according to IADPSG criteria 23.1% women had GDM and 1.1% had OD. There were 8.8% women whose FPG levels were 5.1-5.5mmol/l and 2-h OGTT value lower than 7.8mmol/l. Women who had FPG levels 5.1-5.5mmol/l had higher the odds of having large-for-gestational-age (LGA) newborns, OR 3.7 (95% CI 1.7-4.6) and cesarean delivery OR 1.8 (95% CI 1.3-2.3) compared to women in the control group. **Conclusion.** Our results confirm that women with FPG levels 5.1-5.5mmol/l are at increased risk of adverse maternal and perinatal outcome.

ADIPOKINES, NON-ALCOHOLIC FATTY LIVER AND ORAL GLUCOSE TOLERANCE TEST IN OVERWEIGHT/OBESE PREGNANT WOMEN

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Intruduction: Obesity is an important pro-inflammatory factor that leads to Gestational Diabetes Mellitus (GDM). The liver plays a central role in the biochemistry metabolism. The majority of these functions are damaged in people with non-alcoholic fatty liver(NASH). The role of some adipokines in inflammatory reactions are being studied recently.

Objective: To evaluate the prevalence of NASH in overweight/obese pregnant women between 18 and 30 weeks of gestation and its possible association with GDM and inflammatory proteins. **Methods:** We performed a cross-sectional study in patients with body mass index $\geq 25\text{Kg/m}^2$, healthy, with gestational age of 18 to 30 weeks who performed a two hour 75g oral glucose tolerance test (OGTT). In fasting values we evaluate the adipokines. We consider GDM at least one anormal value: fasting 92-125 mg/dL, 1h 180 mg/dL or 2 h 153-199 mg/dL (IADPSG criteria). After the OGTT, the patients had an abdominal ultrasound. We compared the laboratory profile between the women with GDM or not and with NASH or not. We measured adiponectin, leptin and resistin by ELISA. **Results:** We included 117 patients in the analysis: 31(26,5%) had GDM and 86(73,5%) had normal OGTT. The NASH prevalence was 41% (n=48). We do not observe any diference between the adipokines levels in the groups with or without NASH. **Conclusion:** We found a high prevalence of NASH in the pregnant women recruited. We do not found association between NASH and glucose intolerance or adipokines serum concentrations (adiponectin, leptina and resistin).

GESTATIONAL DIABETES: THE INFLUENCE OF MATERNAL WEIGHT GAIN ON THE NEWBORN WEIGHT

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Introduction: In order to control hyperglycemia in patients with gestational diabetes it is recommended weight control and diet with low glycemic index. It is concerned that insufficient or excessive weight gain can influence on newborns small for gestational age (SGA) or large for gestational age (LGA) **Objective:** To analyze on the population of women with gestational diabetes, the gestational weight gain and its effects on the newborns weight according to the initial body mass index. **Methods:** Patients with gestational diabetes and single pregnancy attended at de Diabetes Center at UNIFESP- Brazil . The body mass index was classified according to the World Health Organization criteria; Underweight (<18), Normal Range (18 -24,9), Overweight (25 - 29,9) and Obese (>30). Weight gain was considered according to the NIH criteria for each range, considering adequate weight gain: U: 9,5 a 18Kg, N: 11,5 a 16 Kg, Ov: 7 a 11Kg, O: 5 a 9 Kg. Lower and higher values were considered insufficient or excessive. Considering the initial BMI, the newborn weight was evaluated according to the maternal weight gain. **Results:** 413 pregnancies were analyzed, 1 was underweight, 92 normal range, 142 overweight and 178 obese. 128 had insufficient weight gain, 130 normal weight gain and 155 excessive weight gain,. Patients with overweight and obesity who had excessive weight gain had more newborns LGA. It wasn't observed a relation between low weight gain and SGA.

THE INFLUENCE OF MATERNAL WEIGHT ON THE INSULINIZATION ON PATIENTS WITH GESTATIONAL DIABETES.

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INTRODUCTION: 60 to 70% of the patients with gestational diabetes are able to achieve glycemic control through diet and physical activity. However, some patients need insulinization and the adipose tissue seems to increase insulin resistance. **Objective:** To verify if the initial pregnancy weigh influences the need of insulinization for the treatment of gestational diabetes. **Methods:** Analyze patients attended at University Hospital - UNIFESP-Brasil, with diagnosis of gestational diabetes according to the WHO criteria from 2007-12 and IADPSG criteria from 2012-15. Patients were classified by their initial body mass index according to the WHO criteria and the percentage of patients that needed insulinization in each group. **Results:** 484 patients with gestational diabetes were attended, 1 was underweight, 100 normal range, 162 overweight and 221 obese. Among the normal patients, 25 (25%) needed insulinization, the overweight patients and obese 64 (39,5%) and 104 (49,3%) needed insulinization, respectively. **Conclusion:** In this study, 79,1% of the patients diagnosed with gestational diabetes were overweight or obese. Among the patients with normal range, only 25% needed insulinization for glycemic control, while 40-50% of the patients with overweight or obesity needed insulinization, determining a worst prognosis for mother and newborn

ARE WE MISSING THE IMPORTANCE OF DIABETES ON FETAL AND INFANT OUTCOMES IN AN AT RISK POPULATION?

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When diabetes complicates pregnancy, maternal, fetal and infant outcomes may be compromised and alter the maternal/child Lifecourse. In a small urban community, African-Americans experienced 2.5 times the fetal and infant mortality of Caucasians. These disparities increased steadily from 1990 to the late 2000's. A literature review revealed opportunities to develop knowledge of the impact of diabetes on the pregnancy, fetus, infant and future maternal/child health. We hypothesize that diabetes and obesity (BMI30), which contribute to increased insulin resistance, result in poor fetal and infant outcomes (i.e. congenital anomalies, restricted/ accelerated growth, NICU admission, preterm birth, respiratory distress, hypoglycemia, and feeding difficulties). The purpose of this study is to explore the impact, contribution and risk that preexisting/gestational diabetes, and obesity have on fetal and infant outcomes and associated disparities

Methods: Data abstracted from one hospital, 2006 to 2016, where 75% of births occur in a single SE Wisconsin county, will be used for secondary analysis. This heterogeneous population is approximately 25% African-American, 25% Hispanic and 50% Caucasian. To mitigate and assess the effect of obesity on diabetes, each case with diabetes will be matched by BMI with two controls without diabetes. **Analysis:** Descriptive statistics will be calculated for both affected and matched control cases. Chi square statistics will test differences in frequencies and t-tests will test differences in means. Two way between groups ANOVA will test for significant differences between groups, and logistic regression modeling will be used to calculate odds ratios of contributing factors for poor outcomes.

HOMEOSTATIC MODEL ASSESSMENT TO PREDICT GESTATIONAL DIABETES

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Introduction: Gestational diabetes mellitus (GDM) negatively affects pregnancy outcome and may originate from insulin resistance or beta cell dysfunction. Negative effects of GDM can be improved by timely detection and glucose lowering therapy, both dietary and medication. In this study we evaluated whether or not HOMA- β (homeostatic model assessment beta cell function) and HOMA-ir (insulin resistance) as modelled from fasting glucose and insulin were different in abnormal as compared to normal mid-gestational oral glucose tolerance test (OGTT). Methods: After an overnight fast, 980 pregnant women with a risk of developing GDM underwent OGTT at the Maastricht University Medical Center. GDM was diagnosed according to the ISDPSG criteria. HOMA- β ($(\text{insulin} \times 3,3) / (\text{glucose} - 3,5)$) and HOMA-ir ($\text{insulin} \times \text{glucose} / 135$) were assessed from fasting plasma insulin and glucose. Results: 685/980 (69%) women had normal OGTT. As compared to normal women with normal OGTT, women with abnormal OGTT had lower HOMA- β (218 vs 162, $p < 0.0001$) and higher HOMA-ir (2,3 vs 3,2, $p < 0.0001$). Conclusion: GDM relates to decreased beta cell function and increased insulin resistance. A novel to be designed model accounting for both fasting glucose metabolism affecting factors may be able to predict abnormal glucose tolerance test.

CARDIORESPIRATORY FITNESS AND HEALTH-RELATED QUALITY OF LIFE IN WOMEN AT RISK FOR GESTATIONAL DIABETES

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OBJECTIVE: To examine the associations of cardiorespiratory fitness (CRF) and leisure-time physical activity (LTPA) with health-related quality of life (HRQoL) in women at risk for gestational diabetes mellitus (GDM). METHODS: The participants were 39 women planning pregnancy with a history of GDM and/or BMI $29 \text{ kg} \cdot \text{m}^{-2}$. We assessed CRF by measuring maximal oxygen consumption ($\text{VO}_{2\text{max}}$) during incremental cycle ergometer exercise until voluntary fatigue. LTPA was self-reported, and HRQoL assessed with the SF-36 Health Survey (SF-36). RESULTS: The mean (SD) age was 32 (4) years, $\text{VO}_{2\text{max}}$ was 27 (6) $\text{mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$, and LTPA was 2.6 (1.7) $\text{h} \cdot \text{week}^{-1}$. After controlling for BMI, $\text{VO}_{2\text{max}}$ was positively associated with the SF-36 General Health scale (β 1.27, 95% CI: 0.09, 2.44, $P = 0.035$) and the Physical Component Summary (β 0.48, 95% CI: 0.14, 0.82, $P = 0.007$). The General Health scale ($P = 0.023$) and the Physical Component Summary ($P = 0.011$) differed even between those with very poor and poor CRF. After controlling for BMI, LTPA was positively associated with the SF-36 Physical Functioning scale ($r_s = 0.34$, $P = 0.039$), the General Health scale (β 3.74, 95% CI: 0.64, 6.84, $P = 0.020$) and the Physical Component Summary (β 1.13, 95% CI: 0.19, 2.06, $P = 0.020$). CONCLUSIONS: CRF and LTPA were positively associated with perceived general health and physical wellbeing in women planning pregnancy and at risk for GDM.

Even a slightly better CRF would be beneficial for self-rated wellbeing among women with low levels of CRF.

POSITIVE CORRELATED BETWEEN ENHANCED EXPRESSION OF TLR4/MYD88/NF- κ B WITH INSULIN RESISTANCE IN PLACENTAE OF GESTATIONAL DIABETES MELLITUS

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Insulin resistance (IR) is a critical factor of the pathophysiology of Gestational diabetes mellitus (GDM). Toll-like receptor 4 (TLR4) can regulate insulin sensitivity. Thus, we investigated the expressions of TLR4/Myeloid Differentiation factor 88 (MyD88)/Nuclear Factor kappa-light-chain-enhancer of activated B cells (NF- κ B) in term placentae from 33 GDM women and 36 healthy pregnant women with normal glucose tolerance, evaluated local and systemic IR and furthermore identified the association between placental TLR4 and IR. TLR4 protein was expressed in various cells of term placenta, particularly in syncytiotrophoblast of villi. Compared with normal pregnancy, the expression of TLR4/MyD88/NF- κ B pathway increased in the placenta of GDM (p0.05), and these differences were more pronounced in the maternal section of the placenta and the syncytiotrophoblast of villi. In addition, more severe IR was observed in the placenta of GDM patients than the control group, evidenced with higher pIRS-1(ser312) (p0.001) and lower IRS-1 (p0.05) as well as pAkt proteins (p0.01). The expression of TLR4 in placentae is positively correlated with local IR (pIRS-1: r = 0.76, p 0.001 and pAkt: r = -0.47, p 0.001) and maternal fasting (r = 0.42, p 0.01), one-hour (r = 0.52, p 0.01) and two-hour glucose (r = 0.54, p0.01) at OGTT. We found an that enhanced expression of the TLR4-MyD88-NF- κ B pathway occurs in GDM placentae, which positively correlates with heightened local IR in placentae and higher maternal hyperglycemia. The TLR4/MyD88/NF- κ B pathway may play a potential role in the development of IR in placentae of GDM.

POSITIVE CORRELATION BETWEEN ENHANCED EXPRESSION OF TLR4/MYD88/NF- κ B WITH INSULIN RESISTANCE IN PLACENTAL OF GESTATIONAL DIABETES MELLITUS

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Insulin resistance (IR) is a critical factor of the pathophysiology of Gestational diabetes mellitus (GDM). Toll-like receptor 4 (TLR4) can regulate insulin sensitivity. Thus, we investigated the expressions of TLR4/Myeloid Differentiation factor 88 (MyD88)/Nuclear Factor kappa-light-chain-enhancer of activated B cells (NF- κ B) in term placentae from 33 GDM women and 36 healthy pregnant women with normal glucose tolerance, evaluated local and systemic IR and furthermore identified the association between placental TLR4 and IR. TLR4 protein was expressed in various cells of term placenta, particularly in syncytiotrophoblast of villi. Compared with normal pregnancy, the expression of TLR4/MyD88/NF- κ B pathway increased in the placenta of GDM (p0.05), and these differences were more pronounced in the maternal section of the placenta and the syncytiotrophoblast of villi. In addition, more severe IR was observed in the placenta of GDM patients than the control group, evidenced with higher pIRS-1(ser312) (p0.001) and lower IRS-1 (p0.05) as well as pAkt proteins (p0.01). The expression of TLR4 in placentae is positively correlated with local IR (pIRS-1: r = 0.76, p 0.001 and pAkt: r = -0.47, p 0.001) and maternal fasting (r = 0.42, p 0.01), one-hour (r = 0.52, p 0.01) and two-hour glucose (r = 0.54, p0.01) at OGTT. We found an that enhanced expression of the TLR4-MyD88-NF- κ B pathway occurs in GDM placentae, which positively correlates with heightened local IR in placentae and higher maternal hyperglycemia. The TLR4/MyD88/NF- κ B pathway may play a potential role in the development of IR in placentae of GDM.

IMPLEMENTATION OF WHO GESTATIONAL DIABETES MELLITUS DIAGNOSTIC CRITERIA - HAS IT CHANGED THE CLINIC POPULATION?

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Background: Based on HAPO Study findings, the IADPSG proposed new Gestational Diabetes Mellitus (GDM) diagnostic criteria associated with a 1.75 increased risk of adverse outcomes. Endorsed in 2013 by WHO, worldwide adoption has been variable. Our Department implemented these criteria from 1-Mar-2016.

Aim: To compare characteristics and outcomes in GDM women diagnosed by new criteria (Group1) with those diagnosed by previous Australasian Diabetes in Pregnancy Society (ADIPS1988) criteria (Group2).

Methods: From our database of prospectively collected data from an ethnically-diverse high-risk GDM cohort, we compared Group1 women diagnosed 1-Mar-16 to 31-Dec-2016 with Group2 1-Mar-15 to 31-Dec-2015. Group1 outcomes are based on those who have delivered [n=283] (excluding those recently referred or early in management). Management involves two formal diet/GDM education sessions and weekly to fortnightly multidisciplinary clinic visits including Endocrinologist. Women self-monitored finger-prick glucose, fasting and post-prandially. Insulin was prescribed if criteria were not met: (Group1) FBGL5.3mmol/L, 2hr post-prandial BGL7.0mmol/L; (Group2) 5.5mmol/L and 7.0mmol/L respectively. Metformin was not used.

Results: There were 411 women (Group1) and 337 (Group2). Comparing Group1 vs Group2: there was earlier diagnosis (mean+SD) 23.3+5.9 vs 24.1+5.2 weeks (p<0.05) and significant differences by major ethnic background group: European 29.0% vs 23.7%; Middle Eastern 20.9% vs 21.1%; SE Asian 20.2% vs 33.5%; South Asian 21.4% vs 16.6%. Insulin prescription was 30.7% (Group1) vs 38.9% (Group2). SGA and LGA rates respectively were: (Group1) 9.9% and 12.4% vs (Group2) 4.9% and 12.2%.

Conclusions: Following adoption of new WHO GDM diagnostic criteria, there was a 22% increased workload, significant reduction in SE Asian background diagnoses, less insulin use and similar LGA.

INNOVATION IN NUTRITION- THE MICROBIOME AND GDM

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Our bodies are colonized by a multitude of microorganisms whose collective genome, the *microbiome*, complements and enhances our own genome. The intestine contains the largest collection of microbes among all of our body's "habitats". The gut microbiome has a major impact on health through interactions with host cells, extraction of nutrients and energy from the diet, and complex bio transformations of a variety of ingested compounds, including potential carcinogens.

Shifts in the composition of the microbiome occur at different stages in life and changes in the composition (dysbiosis) are also associated with a growing list of diseases. Such associations raise the question of whether the dysbiosis contributes to, or is a symptom of the disease.

Women go through several major physiological transitions during their lifetime, beginning with puberty, followed by conception, pregnancy, and finally menopause. During these changes the female body undergoes hormonal, metabolic, immunological changes, and changes in the microbiome. Recently it has been demonstrated that the gut microbiota is profoundly altered in pregnancy as compared to that in non-pregnant women. Together with what we know about changes in the female vaginal microbiome and other changes that are unique to women, we expect that different pathologies will be correlated with alterations in the microbiome.

Here we test whether there is a correlation between gestational diabetes mellitus and changes in the microbiome, as well as when the changes started and how glucose balance with diet changes will alter the microbiome.

WEIGHT GAIN DURING PREGNANCY IN WOMEN WITH DIABETES: THE PATTERN DIFFERS BY THE TYPE OF DIABETES

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Extremes of weight gain during pregnancy (WGP) are associated with adverse pregnancy outcomes. Institute of Medicine (IOM) recommendations differ by prepregnancy body mass index (BMI). Aim: To analyse WGP in women with gestational (GDM), type 2 (T2DM), and type 1 diabetes mellitus (T1DM). Methods: *Subjects*: Three cohorts of women with diabetes and singleton pregnancies (2770 GDM; 100 T2DM and 469 T1DM). *Maternal characteristics*: Prepregnancy age, weight, height, BMI, insulin treatment during pregnancy and WGP according to IOM. *Statistics*: Descriptive statistics; Chi-square to compare WGP categories. Results: Maternal characteristics in women with GDM, T2DM and T1DM were respectively: Age 33, 34, 30 years; height 160, 159, 161 cm; weight 60, 70, 60 Kg; BMI 23.4, 28.0; 23.0 kg/m²; insulin treatment 47.4, 100 and 100%. WGP according to IOM were: GDM: 52.5% insufficient, 31.4% adequate, 16.1% excessive T2DM 2: 29.8% insufficient, 25.5% adequate, 44.7% excessive T1DM: 16.1% insufficient, 35.3% adequate, 48.6% excessive p 0.001 vs recommendations in the three cohorts; p 0.001 GDM vs T2DM and T1DM; p 0.01 T2DM vs T1DM Conclusion: WGP distribution differs markedly in the three cohorts vs IOM recommendations and between them. We propose that differences are driven by diet restriction in GDM and by insulin treatment in women with T2DM and T1DM. These current patterns should be taken into account in clinical practice.

ASSOCIATION BETWEEN INTRAHEPATIC CHOLESTASIS IN PREGNANCY AND GESTATIONAL DIABETES MELLITUS.

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The aim of the study was to evaluate the association between intrahepatic cholestasis of pregnancy (ICP) and gestational diabetes mellitus (GDM). Study design: A retrospective study of pregnancy outcomes in Of the 3826 pregnancies, 71 were complicated by ICP (1,86%) and 327 by GDM (8.55%). 17 women with intrahepatic cholestasis and gestational diabetes managed at 1st Department of Obstetrics and Gynecology Warsaw Medical University between January 2015 and December 2016. Demographic and clinical outcome data (including maternal age, BMI, infant weight and gender) and

ICP and GDM biochemical measurements were collected. Results: Seventy-one patients were divided into two groups: ICP without GDM (n=54) (Group I) and ICP with GDM (n=17) (Group II). The incidence of GDM in ICP was 23.94% (17/71, OR= 3.19 CI 1.75-5.76). There was no differences between gestational age at birth (251,46 vs 250,53 days) and maternal age (31,36 vs 32,59). There was trend to differences (Group I vs Group II) for BMI before pregnancy (23,84 vs 26,42), weight gain (12,02 vs 9,72 kg), level of platelets (241,19 vs 193), serum level of total bilirubin (0,65 vs 0,44), liver function tests: ALT (197,6 vs 191,18), AST (109,87 vs 102,59) and bile acids (33,53 vs 38,18).

Neonate condition: infant weight (2743,1 vs 2656 g), length (51,26 vs 50,8 cm) and Apgar scale (9,71 vs 9,66), there were no reported cases of stillbirth, but there was no statistical difference probably due to small group of patients.

Conclusions: These data support the hypothesis that the incidence of GDM is higher in women developing ICP.

INSULIN DEPENDANT DIABETES AND PARAPLEGIA BIRTH IN A DISTRICT GENERAL HOSPITAL

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Introduction Pregnancy following spinal cord injury (SCI) is rare. Ten thousand women with SCI live in the UK, 14% become pregnant post injury. Risks include pressure ulcers, anaemia, urinary tract infection (UTI) and postnatal depression. Pregnancy with diabetes is associated with hypertensive disorders, venous thromboembolism, intrauterine growth problems, congenital malformations and stillbirth, also increased insulin demand and hypoglycaemia. Case Report A primiparous patient with singleton pregnancy, SCI and insulin dependent Diabetes, declined care in a tertiary obstetric unit and was successfully managed in a District General Hospital (DGH). There were difficulties with fetal growth, asymptomatic bacteruria and deteriorating renal function thought secondary to poor glucose control and UTI. Discussion

This patient was managed within the joint Diabetic Antenatal Clinic. There was involvement of the Renal, Urological, Anesthetic, and Pediatric teams, also tissue viability and the infant feeding coordinator. Preterm labour is increased in diabetes and also SCI, some advocate admitting patients in the third trimester to avoid unattended birth, especially for patients being cared for in regional centres. Care provision close to this patient's residence decreased this risk. SCI increases risk of postnatal depression. Concerns have been expressed regarding loss of control during pregnancy and birth, difficulties regarding social support and being a new mother on a spinal injuries ward. By agreeing to care within a DGH we have enabled maternal choice, reducing this risk. Conclusion A complex obstetric patient was successfully managed in a DGH. The key to this management was early involvement of multidisciplinary care.

IMPAIRED CEREBRAL OXYGENATION IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Introduction: Women with gestational diabetes mellitus (GDM) are at increased risk of vascular and metabolic disease later in life. Cerebral oxygenation, as assessed by Near Infra-Red Spectroscopy (NIRS), has been found to be impaired in patients with cardiovascular and renal disease, as well as in ageing adults during brain activation. Moreover, patients with diabetes mellitus type 1 and 2 have been shown to exhibit impaired cerebral oxygenation during exercise compared with healthy controls, possibly due to cerebral endothelial dysfunction. **Aim:** To compare cerebral oxygenation during exercise between women with GDM and healthy pregnant individuals. **Participants and Methods:** Pregnant women [GDM (n=21) and age- and parity-matched controls (n=16)] underwent a 3-min intermittent exercise handgrip test during which cerebral oxygenation was continuously monitored by dual-wavelength NIRS (Oxymon, Artinis). Peak changes from baseline and average 3-min responses in oxygenated-hemoglobin (O₂Hb), deoxygenated-hemoglobin (HHb) and total-hemoglobin (tHb) were assessed. **Results:** Women with GDM had significantly lower average response and peak increase in O₂Hb during exercise vs. controls (p<0.05) and a less steep decrease in O₂Hb post-exercise (p<0.05). HHb did not significantly differ between groups; however, there was a trend for a lower increase in tHb in women with GDM than controls (p=0.09).

Conclusions: Despite the transient nature of GDM, impaired cerebral oxygenation during exercise was observed in patients with GDM compared with their healthy counterparts. Future studies should investigate whether these alterations are linked to cerebral endothelial dysfunction.

DOES TWIN PREGNANCY IN WOMEN WITH TYPE 2 DIABETES & GESTATIONAL DIABETES REQUIRE HIGHER INSULIN DOSES VERSUS SINGLETON PREGNANCY?

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Objective: To evaluate the insulin requirements in type 2 Pre-gestational Diabetes Mellitus (Pre-GDM) & Gestational Diabetes Mellitus (GDM) with twin versus singleton pregnancy. **Methodology:** This retrospective observational study included 18 GDM and 6 Pre GDM women delivering twin babies. Age, BMI, HbA1c & weeks of diagnosis matched subjects of GDM (125), type 2 Pre-GDM (26) with singleton pregnancy were considered for comparison of insulin requirement, maternal complications & fetal outcome. Statistical analysis was done by using t-test and Pearson's Chi-square test. **Results:** Amongst GDM, difference in the mean insulin requirement at diagnosis in twin [11.14(11.67)] and singleton pregnancy [11.49(13.84)] was statistically insignificant (P-value 0.942). In Pre-GDM, difference in insulin requirement at diagnosis of twin [25.33 (19.79)] and singleton pregnancy [32.66(21.26)] was statistically insignificant (P-value 0.4466). Increase in insulin dose amongst twin vs. singleton pregnancy from diagnosis to delivery in GDM & Pre-GDM was statistically insignificant (P-value:0.4948 & P-value:0.1026 respectively). In GDM women, PCOD, PIH and BOH were significantly higher in twin vs. singleton pregnancy with P-values 0.0098, 0.0273 and 0.0001 respectively. In pre-GDM, hypothyroidism in twin pregnancy was significantly higher than singleton (P-value:0.0165). Low birth weight was statistically significantly higher in twin versus singleton pregnancy in both GDM and Pre-GDM (P-values 0.0001 and 0.026 respectively). Neonatal macrosomia & hypoglycaemia didn't show any significant association. **Conclusion:** GDM or Type 2 pre-GDM women with twin pregnancy don't require higher insulin doses versus singleton. GDM with twin pregnancy are at higher risks to have PCOD, PIH & BOH. Macrosomia is uncommon in twin pregnancy.

IMMEDIATE DELIVERY OR EXPECTANT MANAGEMENT IN GESTATIONAL DIABETES AT TERM: THE GINEXMAL RANDOMISED CONTROLLED TRIAL.

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OBJECTIVE: To evaluate maternal and perinatal outcomes after induction of labour versus expectant management in pregnant women with gestational diabetes at term. **DESIGN:** Multicentre open-label randomised controlled trial.

SETTING: Eight teaching hospitals in Italy, Slovenia, and Israel. **SAMPLE:** Singleton pregnancy, diagnosed with gestational diabetes by the International Association of Diabetes and Pregnancy Study Groups criteria (IADPSGC), between 38+0 and 39+0 weeks of gestation, without other maternal or fetal conditions. **METHODS:** Patients were randomly assigned to induction of labour or expectant management and intensive follow-up. Data were analysed by `intention to treat`. **MAIN OUTCOME MEASURES:** The primary outcome was incidence of caesarean section. Secondary outcomes were maternal and perinatal mortality and morbidity. **RESULTS:** A total of 425 women were randomised to the study groups. The incidence of caesarean section was 12.6% in the induction group versus 11.7% in the expectant group. No difference was found between the two groups (relative risk, RR 1.06; 95% confidence interval, 95% CI 0.64-1.77; P = 0.81). The incidence of non-spontaneous delivery, either by caesarean section or by operative vaginal delivery, was 21.0 and 22.3%, respectively (RR 0.94; 95% CI 0.66-1.36; P = 0.76). Neither maternal nor fetal deaths occurred. The few cases of shoulder dystocia were solved without any significant birth trauma. **CONCLUSIONS:** In women with gestational diabetes, without other maternal or fetal conditions, no difference was detected in birth outcomes regardless of the approach used (i.e. active versus expectant management). Although the study was underpowered, the magnitude of the between-group difference was very small and without clinical relevance.

DELIVERY OF AN LGA INFANT AND THE MATERNAL RISK OF DIABETES: A PROSPECTIVE COHORT STUDY

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Study design: A prospective cohort study. **Objective:** Was to determine whether the birth weight of the infant predicts prediabetes (impaired fasting glucose (IFG), impaired glucose tolerance (IGT), or both) and type 2 diabetes (T2DM) in patients with or without gestational diabetes mellitus (GDM). **Methods:** The patients with or without GDM during their pregnancies in Kuopio University Hospital in 1989-2004 (n=876) were contacted and invited for an evaluation. The patients were stratified into two

groups according to the newborn's birth weight: 10-90th percentile (n=662) and 90th percentile (n=116). Glucose tolerance was evaluated with an oral glucose tolerance test after a mean follow-up time of 7.3 (SD 5.1) years. Results: The incidence of T2DM was 11.8% and 0% in the patients with and without GDM, respectively, after a large-for-gestational-age (LGA) delivery ($p = .0001$). The incidence of prediabetes increased with birth weight categories in the patients with and without GDM: from 46.3% and 26.2% (birth weight 10-90th percentile) up to 52.9% and 29.2% (birth weight 90th percentile), respectively. Conclusion: GDM patients with LGA infants are at an increased risk for subsequent development of T2DM and therefore represent a target group for intervention to delay or prevent T2DM development. In contrast, an LGA delivery in the absence of GDM does not increase T2DM risk.

PRESENTATIONS TO ANTENATAL DIABETES CLINIC FROM FIRST SCREENING BLOOD TEST

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Background Historically antenatal screening for gestational diabetes (GDM) was offered to women with specific risk factors, or a glucose challenge test at 24-28 weeks gestation. From February 2016 HbA1c was included in the first antenatal blood tests¹. Women with an HbA1C between 40-49mmol/mol receive one hospital appointment and then follow standard care. Because concern was raised that the clinic would be under-resourced to manage these women we aimed to quantify the number presenting to the clinic and their outcomes. **Methods** All pregnant women in the Wellington region with a recorded HbA1C were identified and those with an HbA1c between 40-49mmol/mol were reviewed for clinical outcomes. Data for women with an HbA1c 35-39mmol/mol were additionally explored. **Results** Between February 2016 and December 2016 0.57% (n=50) women had HbA1C 50mmol/mol, 0.4% (n=36/8692) women had an HbA1C 40-49mmol/mol - 11 had contact with Wellington Maternity Services: two had pre-existing diabetes; six required insulin therapy. 3.7% (n=320) of all pregnant women had a booking HbA1C between 35-39mmol/mol. 50% of women presenting to clinic with an HbA1C 40-49mmol/mol had previously had a booking HbA1C 35-39mmol/mol. **Conclusion** First, although funded universal screening now occurs, access to secondary care does not appear inclusive despite the current clinic being well-resourced to manage women with an initial HbA1C 40-49mmol/mol. Second, of concern is the large number of women with an HbA1C 35-39mmol/mol who progress to gestational diabetes. More widespread lifestyle education from a lead maternity carer may prevent this and should be explored further.

GESTATIONAL DIABETES MELLITUS IS ASSOCIATED WITH ALTERATIONS IN ONE CARBON METABOLISM

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Gestational diabetes mellitus (GDM) is a multifactorial disease originated by environmental, genetics and epigenetics factors, including DNA methylation. Methionine adenosyltransferase (MAT1A) catalyzes the formation of adenosylmethionine, an important methyl donor in most transmethylation reactions, from methionine and ATP. Additionally, the methylation of homocysteine to methionine is catalyzed by the enzyme methionine synthase or 5-methyltetrahydrofolate-homocysteine methyltransferase (MTR). The correct function of both enzymes, and consequently the one carbon

metabolism, may affect the epigenetic regulation of gene expression. Since various polymorphisms (SNP) of the enzymes MAT1A and MTR have been described, the aim of this study was to analyze the allelic distribution of rs7087728 and rs1805087 SNP in the MAT1A and MTR genes respectively in pregnant women with and without GDM. Moreover, the total methylated DNA was quantified in placental tissue, and the homocysteine levels were determined in the serum of all women. The results show that in the women with GDM, the C allele in MAT1A and the G allele in MTR are significantly more frequent than in the controls. In addition, the GDM pregnant women present lower DNA methylation in placenta and higher circulating homocysteine than controls. These results suggest that GDM may be related to an alteration in the one carbon cycle. This may be involved in DNA methylation and the epigenetic regulation of gene expression, which may contribute to the development of pathologies associated with the metabolic syndrome in the adult life.

FATTY ACID PROFILE IN MATERNAL AND FETAL BLOOD OF PREGNANT WOMEN WITH TYPE 1 DIABETES MELLITUS

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Objective: To investigate the impact of type 1 diabetes mellitus (T1DM) on the fatty acids profile in the maternal and umbilical vein blood. **Methods:** 60 pregnant women who delivered eutrophic infants (30 pregnant women with T1DM and 30 healthy pregnant women) were included in the study. Immediately after birth maternal and umbilical vein (UV) blood samples were collected. After lipid extraction, gas chromatography was obtained in order to obtain profile of fatty acids in total lipids of maternal and UV serum. **Results:** Infants of mothers with T1DM had a significantly higher concentration of glucose, C-peptide, leptin, higher ponderal index and higher insulin resistance than infants in the control group ($p < 0.001$). The total concentration of fatty acids in maternal serum did not differ between the experimental groups ($p = 0.122$). The total concentration of fatty acids in the UV serum was statistically significantly higher in infants born to diabetic mothers compared to the control group (2243.3 ± 177.1 : 1360.0 ± 138.0 ; $p < 0.001$). Comparing individual profile of fatty acids in maternal serum of two studied groups, we didn't find statistically significant difference. When comparing individual fatty acids in the serum of UV, statistically significant differences in almost every fatty acid, except for gamma-linolenic and docosahexaenoic fatty acid (C18: 3n-3 and DHA) was found. **Conclusion:** Good metabolic control of pregnant women with T1DM has resulted in small and insignificant changes in the maternal blood fatty acids profile and delivery of eutrophic newborns although total concentration of fatty acids in UV serum was still higher when compared to the values from infants born to the healthy mothers.

C-PEPTIDE IN TYPE 1 DIABETIC PREGNANT PATIENTS

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Type 1 diabetes mellitus (T1DM) is an autoimmune disease in which the β -cells of the pancreatic islets are selectively destroyed resulting in decline in endogenous insulin secretion. Some patients with T1DM may have some insulin secretion until their β -cells are not completely destroyed. Appropriate measure of β -cells secretory function is concentration of C-peptide (nmol/L). Some studies proved that increased intake of some supplements (vitamins D and E, nicotinamide and n-3 polyunsaturated fatty acids, PUFA) may support preservation of β -cell function and can have protective effects on T1DM. The aim of our pilot study was to demonstrate the effect of pregnancy and n-3 PUFA on secretion of

C-peptide throughout pregnancy in women with T1DM. The State Referral Centre for Diabetes in Pregnancy in the Department of OB/GYN successfully surveils and delivers diabetic pregnant women and has implemented routine tracking of C-peptide concentration. This research includes 40 pregnant women with T1DM with detectable C-peptide concentration (0,01 nmol/L), divided in 2 groups. Study group was put on a standard diabetic diet enriched with n-3 supplement which contains eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Control group was on standard diabetic diet without n-3 PUFA. Preliminary results showed that during pregnancy, C-peptide concentrations were increased in both groups. But statistically significant difference was found in the study group between first and third trimester C-peptide values. To confirm these preliminary results with certainty, it is necessary to expand research with a larger number of pregnant women with T1DM.

EVALUATION OF A HOME-USE ORAL GLUCOSE TOLERANCE TEST KIT IN PREGNANCY

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Screening for gestational diabetes (GDM) with a clinic-based 75g oral glucose tolerance test (OGTT) and venous plasma glucose (VPG) measurement is resource-intensive and inconvenient for pregnant women. A home-use OGTT kit, which uses sensors to measure glucose in capillary whole blood (CWBG) from finger-stick samples, has been developed and tested outside pregnancy. A software algorithm, based on non-pregnant data, converts measured CWBG into venous plasma equivalent glucose readings (VPEqG). Aim: To evaluate the home-use OGTT kit in pregnancy.

Methods: Pregnant women between 16-34 weeks gestation, with previous GDM, BMI $\geq 40\text{kg/m}^2$ or random VPG $\geq 6.7\text{mmol/l}$, underwent a 75g OGTT. At time 0, 60 and 120min capillary blood was tested using the home-use OGTT kit and VPG measured on a YSI 2300 Stat Glucose Analyser immediately after drawing (VPG-YSI) (reference standard). Results: Complete datasets were obtained in 84 women (age 34.0 ± 4.9 (mean \pm SD) years; gestation 28 (17-34) (median, range) weeks; ethnicity 51.2% White, 28.6% Black, 20.2% other). Using VPG-YSI, 45% had GDM (IADPSG 2010 criteria). Across all time-points, there was a strong positive correlation between home-use OGTT kit VPEqG and VPG-YSI ($r=0.935$, $p<0.001$). However there was a negative bias ($-9.2\pm 11.9\%$, mean \pm SD). Conclusions: The relationship between CWBG and VPG may be different in pregnancy and a pregnancy-specific algorithm for converting OGTT kit measurement into VPEqG is being developed from the present data. If this is validated, the home-use OGTT kit could make screening for GDM considerably less expensive, and more convenient and acceptable to women, encouraging provision and uptake of GDM screening.

CAN WE DEVELOP A SUCCESSFUL RISK SCORE FOR GESTATIONAL DIABETES?

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Introduction: The epidemic of diabetes requires methods for early detection of individuals at risk. Risk scores have been successfully developed for type 2 diabetes, but the gestational diabetes (GDM) scores are not performing equally well. The aim of this study was to investigate the risk profiles of GDM women, taking simultaneously into account the marked heterogeneity of GDM. **Methods:** This is a secondary analysis of the RADIEL study including 510 women at high GDM risk (BMI ≥ 30 kg/m² and/or previous GDM) recruited either in pre-pregnancy or in first trimester. We divided the participants according to BMI, parity and GDM history. Age, weight, family history of diabetes and first trimester markers of inflammation, lipid and glucose metabolism served as potential predictors for GDM. **Results:** The cumulative GDM incidence was 37.4% (95% CI: 33.2 to 41.8) in the first trimester and 49.4% (95% CI: 45.0 to 53.8) in the second trimester. Among the women with previous GDM, non-obese (BMI ≥ 30 kg/m²) women had in the second trimester a 59% cumulative GDM incidence while obese had 74%. Primiparous obese women showed an increased GDM risk with higher fasting glucose [OR 3.76 (95% CI: 1.48 to 9.53)] but the other subgroups had no risk predictors. **Conclusions:** Our “risk model”, simply based on degree of adiposity and GDM history, performed as well as more sophisticated models in identifying a high GDM-risk group already in the first trimester. Due to the heterogeneity of GDM, it might be impossible to achieve a universal risk score.

IS ROUTINE USE OF ANTENATAL NONSTRESS TESTS STILL NECESSARY IN PREGNANCIES IN WOMEN WITH PRE-EXISTING DIABETES?

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Objective: To evaluate the efficacy of routinely performed antenatal nonstress tests (NST) in pregnancies in women with pre-existing diabetes. **Method:** Observational study of 642 consecutive singleton pregnancies in women with pre-existing diabetes with delivery after 22 weeks. Daily maternal assessment of fetal activity was recommended from 28 weeks, and routine NSTs were performed weekly from 33-35 weeks. Further indications for NSTs were excessive or reduced fetal growth, preeclampsia, hypertension, reduced umbilical flow and decreased fetal activity. The consequences of routine and indicated NSTs were evaluated. **Results:** In total 3016 routine NSTs were performed; median five per pregnancy. Ninety five NSTs (3.1 %) were classified as abnormal, with only eight (0.3%) being abnormal when retested and thus leading to delivery. Pregnancy complications were present in seven of these eight pregnancies; three had abnormal arterial umbilical flow, three excessive fetal growth and one had polyhydramnios, while no fetal activity three days prior to the routine NST was reported in the eighth pregnancy. In 86 pregnancies maternal perception of decreased fetal activity led to in total 127 NSTs. In 10 (11.6%) of these pregnancies the combination of decreased fetal activity and further obstetrical assessment indicated delivery. One stillbirth occurred in the cohort, giving a stillbirth rate of 1.6/1000. HbA1c was 6.0 (4.6-9.0) % in late pregnancy and 98.8 % was without diabetic nephropathy. **Conclusion:** In women with pre-existing diabetes, abnormal NSTs are rare, and routine antenatal NSTs do not seem necessary in uncomplicated pregnancies with normal fetal activity.

BODY MASS INDEX, FIRST TRIMESTER PREGNANCY ASSOCIATED PLASMA PROTEIN-A, HbA1c LEVELS AND DEVELOPMENT OF GESTATIONAL DIABETES MELLITUS IN ARAB WOMEN.

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Introduction United Arab Emirates has a high prevalence of gestational diabetes mellitus (GDM). Early detection can help to manage the condition with appropriate interventions. **Objective** To study association of pre-gestational Body Mass Index (BMI), first trimester Pregnancy associated plasma protein-A (PAPP-A) and HbA1c levels with development of GDM in Arab women. **Materials and Methods** Normal Arab women (n=162), 11-13 weeks pregnant were enrolled in a prospective study. HbA1c, PAPP-A levels were measured. Women were followed-up, screened for GDM between 24 and 28 weeks as per American Diabetes Association 2016 criteria. Data was analyzed using SPSS 22.0. T-test, Mann-Whitney was used for significance, Pearson's and Spearman's test for correlations. **Results** BMI of the participants, mean±SD was 26.05± 4.94. 43.8% women were overweight or obese. HbA1c (%) mean±SD was 5.34±0.36 in normal weight women and 5.56±0.41 in obese women. ANOVA showed difference in HbA1c between groups to be significant (p=0.01) though there was no difference in Hemoglobin levels. PAPP-A (mIU/L) Median was 2656, IQR 1467-4450. Based on screening, 32.85% women were diagnosed as having GDM. PAPP-A (Multiples of Median) in GDM group was lower (mean±SD = 1.05±0.93) compared to normal group (mean ±SD = 1.33±1.02) but the difference was not significant. Logistical regression found higher BMI to be significant predictor for GDM. **Conclusion** Women with higher pre-gestational BMI had lower first trimester PAPP-A levels, higher HbA1c levels and were at increased risk for development of GDM in the second trimester. **Acknowledgements** This study was funded by the Al Jalila foundation, UAE.

PLACENTA IN GDM: FEATURES OF MORPHOFUNCTIONAL STRUCTURE

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Object: To explore levels of VEGF, eNOS, IGF1R and mast cells (MC) expression in GDM placenta. **Methods:** 55 placentas were divided into 4 groups: GDMA1 (n=20, group I); GDMA2 (n=20, group II); preeclampsia (n=10, group III); normal (n=5, group IV). Immunohistochemistry tests were performed using antibodies to NOS-3, VEGF IGF1R, α -amylase. **Results:** The highest area of expression of VEGF was observed in GDMA1 – 5,27 %, which was twice higher, then in control group 2,86 %, and in preeclampsia 2,07%. Expression VEGF in GDMA2 was lower – 0,75%. The biggest area of expression of eNOS was observed in group I – 7,28 %, and the smallest in group II - 1,1%. The expression of eNOS in control and preeclampsia groups was in average levels - (3,9%-2,05%). The area of IGF1R expression was the biggest in GDM - (3,44%-5,18%). The smallest area was detected in preeclampsia – 1,02%. The area in control group was average – 2,47%. In GDM the number of MC was significantly higher (in 1,5 times), compared with groups III and IV.

Conclusion: In GDMA1 increase synthesis of VEGF and eNOS, that lead to hypervascularization terminal villi in placenta. In GDMA2 the decrease of expression VEGF and eNOS leads to higher preeclampsia rate and IUGR. The increase level of IGF1R in GDM placenta may be possible cause of fetal macrosomia. The minimal area of IGF1R expression in preeclampsia may be one of the reasons for IUGR. Changes in the number of MC in the placenta can detect placental pathology associated with local inflammation.

COAGULOPATHY AND ENDOTHELIAL DYSFUNCTION IN GDM: IS THERE A LINK?

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Object: to explore the features of the hemostatic system and endothelial dysfunction in pregnant women with GDM.

Methods: 157 pregnant women were divided into 4 groups: GDMA1 (n=70, group I); GDMA2 (n=40, group II); preeclampsia (n=30, group III); normal (n=17, group IV). Coagulation studies and content of D-dimer, homocysteine and vWF were performed by common methods. Results: Fibrinogen was higher in GDMA1 - 4,64 g/l, GDMA2 – (5,0) and preeclampsia – (4,54), compared to the control group – (4,04). AT III in GDM (88,93 – 93,08%) and preeclampsia (87,92) was reduced, compered to control group – (105,44). The highest D-dimers were observed in GDMA1 – (752,8 ng/ml), GDMA2 – (732,04) and preeclampsia – (636). D-dimers in control group were– (509,29). ET-1 were the highest in GDMA2-3,82 fmol/l, and the lowest - in group IV – (2,54). In preeclampsia ET-1 was lower, but higher than in the control group-(2,83). sICAM-1 were the highest in GDM: A1-332,35 ng/ml, A2-(349,86), and the lowest in preeclampsia – (277,56). In group IV sICAM-1 was – (288,8). Significant group differences of sICAM-1 have not been received. The highest values of homocysteine were obtained in GDMA2 – 7,23 mmol/l, and lowest in control group-(5,78). Patients of I and IV groups had comparable indicators of homocysteine – (6,87 - 6,74). The highest level of vWF was in GDMA2 - 2.92 U/ml, and the lowest in control group – (1,7). vWF values in GDMA1 and preeclampsia were comparable (2,46 - 2,44).

Conclusions: survey sets the straight link between coagulopathy and endothelial dysfunction in GDM, which leads to incidence of preeclampsia and placental insufficiency.

INTRAUTERINE HYPERGLYCAEMIA INDUCED INFLAMMATORY SIGNALLING VIA THE RECEPTOR FOR ADVANCED GLYCATION END PRODUCTS IN THE CARDIAC MUSCLE OF THE INFANTS OF DIABETIC MOTHER RATS

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Infants of diabetic mothers (IDM) have circulation-related abnormalities. Hypertrophic cardiomyopathy in the IDMs is caused by chronic inflammation. We have previously reported that IDMs showed abnormalities in Akt-related insulin signalling of the cardiac muscle, and that an eicosapentaenoic acid (EPA) maternal diet improved the impaired signalling. In this study, we investigated inflammatory signalling and assessed levels of advanced glycation end products (AGEs) in the cardiac muscle. Pregnant diabetic rats were first administered streptozotocin and then fed

eicosapentaenoic acid (IDM/EPA) or water (IDM/W) via a gastric tube. Infants of normal mothers were designated as the controls. We isolated the primary neonatal cardiomyocyte cells for analysis. The levels of AGEs were elevated in the IDM/W compared with controls. The gene expression level of the receptor of AGEs (RAGE) increased in the IDM/W owing to increase in AGE levels. The amount of reactive oxygen species; gene expression levels of NF- κ B, TNF α , and IL-6; and the phosphorylation levels of JNK were higher in the IDM/W than in the controls. However, these were significantly lower in the IDM/EPA group. Binding of AGEs to RAGE triggers activation of c-Jun NH2-terminal kinase signalling pathways and expression of genes linked to inflammatory cell dysfunction in chronic stressors. Our results suggest that intrauterine hyperglycaemia induces the inflammatory signalling pathway in the cardiac muscle of IDMs by the activation of AGEs-RAGE signalling, and that EPA supplementation during pregnancy could suppress this inflammatory signalling.

GESTATIONAL DIABETES MELLITUS: THE IMPACT OF NEW DIAGNOSTIC CRITERIA ON PREGNANCY OUTCOMES

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Background The WHO adopted new diagnostic criteria for gestational diabetes mellitus (GDM) in 2013. In the Netherlands, the WHO1999-criteria are recommended in GDM. We aimed to evaluate the pregnancy outcomes between old (WHO1999, fasting-glucose ≥ 7.0 and/or 2-hour-glucose ≥ 7.8 mmol/l) and new WHO-criteria (WHO2013, fasting-glucose ≥ 5.1 and/or 2-hour-glucose ≥ 8.5 mmol/l). **Methods** Women with singleton pregnancies were screened for GDM with a 75-gram OGTT if they had risk factors or signs suggestive for GDM (2011-2016). Pregnancy outcomes were retrospectively compared between a non-GDM-control-group, fasting-glucose 5.1 and 2-hour-glucose 7.8 mmol/l and two groups: WHO2013+/WHO1999-, fasting-glucose ≥ 5.1 -6.9 and 2-hour-glucose 7.8 mmol/l (untreated); WHO2013-/WHO1999+, fasting-glucose 5.1 and 2-hour-glucose ≥ 7.8 -8.4 mmol/l (treated). **Results** 2735 women were included, GDM prevalence was 33.4% (WHO1999) and 38.7% (WHO2013). Women testing WHO2013+/WHO1999- (13.9%) were older, had a higher pre-gestational BMI (median 29.4 [IQR 24.8-33.8] vs. 25.3 [IQR 24.1-31.8] kg/m²), higher rates of emergency caesarean section (16.8% vs. 12.6%) and induction of labour (34.1% vs. 28.5%) compared with the control-group. Frequency of LGA-neonates was not significantly different (18.7% vs. 16.8%). Women testing WHO2013-/WHO1999+ had comparable rates of LGA-neonates (15.4% vs. 16.8%) and emergency caesarean section (12.0% vs. 12.6%) compared with the control-group. 20.5% of the women in this group were treated with insulin therapy.

Conclusion The lower cut-off of fasting glucose in the WHO2013-criteria identified a group of women (WHO2013+/WHO1999-) with an increased risk of adverse outcomes. However, adopting the WHO2013-criteria with a higher 2-hour glucose cut-off excludes women who now benefit from treatment. We postulate that the change in WHO-criteria will have considerable impact on pregnancy outcomes.

PERINATAL OUTCOMES IN PATIENTS WITH TYPE 1 DIABETES MELLITUS (T1DM)

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Background and aims: The aim of study was to analyse some perinatal outcomes in mothers with type 1 diabetes mellitus (T1DM) managed in tertiary unit centre in Bratislava. Methods: 118 diabetic mothers, with singleton pregnancy, with T1DM delivered at the 1st Department of Obstetrics & Gynaecology Faculty of Medicine, Comenius University in Bratislava from January 1st 2009 to December 31th 2015 were included to the study. Results: Mean maternal age at time of delivery was 29.3 years. Mean gestational age was 36.4 weeks at the time of delivery. According White's classification, the distribution of T1DM mothers was 30.5 % in class C, 22.9 % in B, 18.6 % in D and F (each of them), 7.6 % in R and 1.7 % in class H. Out of them, 53.4 % were without vascular complications and 46.6 % had vasculopathy. In the vasculopathy group there was significantly higher incidence of preeclampsia - 49.1 versus 19.1 % ($p = 0.002$) and caesarean section rate - 89.1 versus 68.3 % ($p = 0.017$) compared to nonvasculopathy group. Neonatal morbidity and mortality rates were higher in vasculopathy group, but not statistically significant. Perinatal mortality rate was 25.4 per 1,000 total births. Adequate preparation for pregnancy in our study group was only 9.3 %.

Conclusion: Successful pregnancy in diabetic women is possible, when qualified management is provided. Appropriate preparation for pregnancy and accurate metabolic balance before and during the whole pregnancy is very important for good outcomes for mother and baby too.

THE EFFECT OF ETHNIC ORIGIN ON GESTATIONAL DIABETES MELLITUS IN A UNIVERSITY AFFILIATED HOSPITAL IN THE CENTER OF ISRAEL

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Objectives: The aim of this study was to evaluate maternal and neonatal outcome in women with gestational diabetes mellitus (GDM) among ethnic populations in the center of Israel. Methods: This is a retrospective cohort study based on computerized medical records of high risk outpatient-clinic GDM patients at Assaf Harofeh Medical Center between 2005-2015. Results: The study included 1332 women: 86% Non-Ethiopian Jews, 6.2% Arabs and 4.7% Ethiopian women. Ethiopian women had a lower pre-pregnancy and pre-delivery weight compared to non-Ethiopians (62kg±9.9 for Ethiopians vs 73kg±16 for Jews and 75kg±16 for Arabs before pregnancy and 72kg± 8.6 for Ethiopians vs 84kg±16 for Jews and 86kg±15 for Arabs before delivery, $p < 0.01$). Neonates of Ethiopian mothers were smaller than those of Arab mothers (3093gr±604 vs 3341gr±562 $p = 0.029$) and tended to be smaller than non-Ethiopian Jewish neonates (3254±552 $p = 0.082$). Neonatal macrosomia was evident in 110 babies: 3.2% for Ethiopians, 8.4% for non-Ethiopian Jews and 8.6% for Arabs ($p = 0.32$). The rate of cesarean section (C-section) was not different between groups: 45.3% for non-Ethiopian Jews, 39.8% for Arabs and 45% for Ethiopian women ($p = 0.41$). In women undergoing C-section, neonatal weight was significantly lower among Ethiopian women compared to non-Ethiopian Jews (3296±639 vs 2956 ±655 $p = 0.024$ or to Arab women (3535±668 $p = 0.002$). Conclusions: Ethnicity carries maternal and fetal implications in women with GDM. In the current study, although C-section rates were similar,

neonatal weight was overall smaller in Ethiopian women. Further studies are needed in order to define traits of GDM unique to this sub-population.

EVALUATION OF PHYSICAL ACTIVITY AND ENERGY EXPENDITURE AMONG PATIENTS IN GESTATIONAL DIABETES MELLITUS (GDM).

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Introduction. The healthy life style is crucial for patients in Gestational Diabetes Mellitus, including the adequate physical activity (PA). **The aim of the study:** To evaluate PA in the group of patients in Gestational Diabetes Mellitus. **Material:** We evaluated the PA of 20 women (mean age 31.2±3.1, median hbD 30) in GDM using 3-axis accelerometer measuring skin temperature, galvanic skin response, heat flux from the body and movement. These data were processed automatically to calculate total energy expenditure and metabolic PA. **Results.** The mean measurement time in studied patients was 142:35 [hours:minutes], mean daily lying duration 9:09 [hours:minutes], mean daily sleep duration 7:29 [hours:minutes]. The PA duration was very low, especially at the higher levels. The dominated level of PA was sedentary (0-3 metabolic equivalents, for example sitting, housekeeping; 1 MET = equivalent to 3.5 ml/kg/min of oxygen uptake) – daily mean 21:44[hours:minutes], daily moderate PA (3-6 METs, for example walking) took only 1:27, mean time of vigorous PA (6-9 METs, like running, jogging) was 2 minutes at the time of registration and only in 10 patients. Daily Total Energy Expenditure (TEE) per person was 2238,22 kcal (SD ± 346,35kcal) and Daily Active Energy Expenditure (AEE) per patient was 366,87 kcal (SD± 167,98kcal). **Conclusions.** The PA and AEE in the studied group of the patients in GDM was low. There is the challenge for the medical staff to motivate these patient to increase PA and AEE as the one of the most important factor to treat GDM.

BARRIERS AND FACILITATORS TO GESTATIONAL DIABETES MELLITUS TREATMENT IN SOUTH INDIA: A QUALITATIVE STUDY

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Background Gestational diabetes mellitus (GDM) increases the risk of future type 2 diabetes as well as the risk of a range of adverse pregnancy outcomes. In India, around one in five pregnant women develops GDM. In this study we investigate barriers and facilitators to GDM treatment for women diagnosed with GDM in Tamil Nadu, India. Material and methods Semi-structured interviews with 19 women diagnosed with GDM from an urban and a semi-rural site in Tamil Nadu were conducted and analysed using qualitative content analysis. Results The following factors emerged as impeding treatment: the treatment is considered counterintuitive to lay perceptions of what is perceived as safe or healthy during pregnancy; low/poor interaction with health care providers, including receiving diverging messages regarding treatment; hardship associated with treatment such as cravings and pain from injections; difficulties in coordinating with work and social life; cost and availability of food items, insulin and health care; and feeling like a nuisance to the family. In turn, social support and good interactions with health care providers facilitated the treatment. Conclusions Our study identified a number of barriers to GDM treatment. However, we also found that social support and positive, high quality interactions with health care providers could mitigate some of these barriers and facilitate the treatment process. Efforts and adjustments at the individual, community and health system levels are

needed in order to ensure that women with GDM are not only able and motivated to follow the treatment, but also have the opportunity to do so.

METFORMIN VS INSULIN FOR THE TREATMENT OF GESTATIONAL DIABETES MELLITUS - IMPACT ON PREGNANCY OUTCOMES AND PATIENT SATISFACTION

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BACKGROUND: In light of growing evidence recommending metformin as the first-line drug therapy for gestational diabetes mellitus(GDM), the Diabetes in Pregnancy Clinic at Sunnybrook Hospital implemented the ‘Metformin First’ protocol in January 2016. Metformin is now offered to all clinic patients requiring medication for management of GDM.

OBJECTIVES&METHODS: A retrospective chart review was conducted of new GDM patients seen at the clinic prior to(Jan-Jul2015) and following(Jan-Sept2016) implementation of the protocol to compare pregnancy outcomes. A prospective patient survey was also administered to evaluate impact on patient satisfaction and clinic efficiency. **RESULTS:** 264 patients were included in the chart review: 159(60%) were treated with lifestyle modifications alone, 46(17%) with metformin, 40(15%) with insulin and 19(7%) with metformin+insulin. There were no significant differences in rates of pregnancy complications (obstructed labour, infants born large for gestational age, NICU admissions and infant hypoglycemia) or gestational weight gain between treatment groups. Blood glucose control was also comparable and satisfactory across groups. Of the 65 patients initially started on metformin, 21(32%) were either switched to or provided supplemental insulin therapy. Despite this, the overall percentage of patients started on insulin - thus requiring individualized patient training - dropped significantly(33% in 2015 vs 17% in 2016, p=0.003). Following implementation of the protocol, patient satisfaction scores have also increased (4.68/5 in 2016 vs 4.3/5 in 2013 p=0.01).

CONCLUSIONS: Metformin is comparable to insulin in glycemic control and pregnancy outcomes for women with GDM. Introduction of the ‘Metformin First’ protocol has resulted in improved patient satisfaction and clinic efficiency.

THE SMARTPHONE APPLICATION “PREGNANT WITH DIABETES” COMMUNICATES ANTENATAL HEALTH INFORMATION AND DOES REACH PREGNANT WOMEN WITH DIABETES AND THOSE PLANNING PREGNANCY

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Aim: To evaluate the awareness and use of the smartphone application “Pregnant with Diabetes” locally, nationally and internationally. **Methods:** In 2013 a collaboration between a patient and the staff at The Center for Pregnant Women with Diabetes, Rigshospitalet, succeeded in developing the smartphone application “Pregnant with Diabetes”. The application communicates clinically important antenatal health information to women with diabetes, based on recommendations from The Center for Pregnant Women with Diabetes. To obtain local data regarding the application, 89 women with type 1

and 40 women with type 2 diabetes completed a structured questionnaire at first antenatal visit, mainly in early pregnancy, at our center. National and international data were obtained from Google Play, Google Analytics and App Store.

Results: Among 129 responders, 98% had a smartphone and 75% (type 1 diabetes: 80%, type 2 diabetes: 65%) had downloaded the application, whereof 48% had obtained information from the application before pregnancy. The topics in the application of greatest interest were “the fetus”, “blood glucose”, and “insulin dose”, for women with type 1 diabetes and “diet and carbohydrates”, “what is diabetes” and “blood glucose” for type 2 diabetes. In December 2016, the application had been downloaded 3,810 times in Denmark and 21,640 times in 177 different countries. Internationally, the topics of greatest interest were “diet and carbohydrates”, “blood glucose” and “possible complications”. Conclusion: Easily accessible patient information, via smartphone application technology, reaches the patients and may contribute to improved pregnancy planning and outcome in women with diabetes - locally, nationally and internationally.

POSTPARTUM GLYCEMIC EVALUATION AFTER GESTATIONAL DIABETES: A CHALLENGE IN CLINICAL PRACTICE

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INTRODUCTION Gestational diabetes mellitus (GDM) is the most common metabolic disorder in gestation, with an increasing prevalence, being 7.2% in Brazil using old WHO criteria. It is associated with a 7-fold higher risk of developing type 2 diabetes mellitus (T2DM) after childbirth. **OBJECTIVE:** To estimate the rate of GDM patients returning postpartum and to describe their glycemic assessments 6 to 12 weeks after gestation. Identify the clinical and epidemiological profile of patients who did not return and of patients who remained hyperglycemic after delivery. **METHODOLOGY** A cross-sectional, retrospective, observational study with 109 patients diagnosed with GDM in a referral medical center for diabetes treatment in the Federal District of Brazil, attended from January 2008 to January 2015. **RESULTS** Only 30 patients returned postpartum for glycemic evaluation. Of these, 73% had normal blood glucose and 27% had pre-diabetes. No patient had the diagnosis of diabetes mellitus after pregnancy. Patients who did not return in the postpartum period showed a higher gestational age at the first visit, compared with those who returned. There was no significant association between risk factors and the persistence of postpartum dysglycemia. **CONCLUSION** The rate of return for postpartum blood glucose assessment was very low, evidencing the need for strategies to increase reevaluation after gestation. We observed that the patients who did not return after gestation had a higher gestational age at the first visit, therefore a shorter time of outpatient follow-up.

MATERNAL SUPRAPHYSIOLOGICAL DYSLIPIDEMIA IN WOMEN WITH GESTATIONAL DIABETES MELLITUS WORSE VASCULAR RESPONSE OF UMBILICAL VEIN RINGS.

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Maternal physiological dyslipidemia (MPD) or elevated maternal level of total cholesterol (TC) and triglycerides (Tg) occurs in human pregnancy. Some pregnancies develop supraphysiological dyslipidemia (MSPD), which associates with fetoplacental endothelial dysfunction. Gestational diabetes mellitus (GDM) is a pregnancy disease with maternal and fetal hyperglycemia leading to fetoplacental endothelial dysfunction. Objectives: (1) To determine the prevalence of MSPD in a group of GDM pregnancies. (2) To determine whether MSPD alters endothelial-dependent umbilical vein reactivity in GDM pregnancies. Methods and results: GDM prevalence (7.2%) was estimated in 4732 pregnant women. MSPD was determined as TC 280 and Tg 275 mg/dL at end of pregnancy. A 25.2% of GDM pregnancies showed MSPD (TC: 310±25 vs 226±35 mg/dL and Tg: 349±65 vs 195±52 mg/dL compared with MPD; $P<0.05$). Umbilical vein rings from GDM or normal pregnancies, with or without MSPD were mounted in a myograph and the response to insulin or calcitonin gene related peptide (CGRP) in KCl-precontracted vessels was measured. GDM showed a reduced nitric oxide (NO)-dependent maximal relaxation (estimated in the absence or presence of NO synthase inhibitor N^G -nitro-L-arginine methyl-ester) in response to insulin (GDM: 17±2, normal: 43±6%) and CGRP (GDM: 15±3, normal: 30±3%) ($P<0.05$). MSPD worsen vascular dilation in response to CGRP in vein rings from GDM (MSPD: 12±1, MPD: 26±2%) and normal pregnancy (MSPD: 14±1, MPD: 40±8%) ($P<0.05$). Conclusion: A significant number of GDM pregnancies present MSPD which contribute to GDM-associated endothelial dysfunction by worsening the vascular dilation of umbilical vein rings in this pathology. Fondecyt1150344/1150377

PREVALENCE OF GESTATIONAL DIABETES MELLITUS IN A TERTIARY HOSPITAL IN ASIA

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Background Singapore is a unique country with a population comprising of multiple ethnicities—mainly Chinese, Malay, and Indian. Congruent with the worldwide increase in diabetes mellitus prevalence, there is an increasing prevalence of diabetes mellitus as well as gestational diabetes mellitus (GDM) in Singapore. From January 2016, there was a change of screening strategy for GDM. Instead of a risk-based screening approach, universal screening was adopted. The diagnostic criteria were also changed from World Health Organisation (WHO) criteria to International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria. A 75g oral glucose tolerance test is routinely performed at 24–28 weeks gestation. Fasting plasma glucose and 2 hour plasma glucose were performed previously. Currently fasting plasma glucose, 1 hour and 2 hour plasma glucose are performed. Method This is a retrospective analysis of the biochemical data of all pregnant women who had an oral glucose tolerance test performed. This study evaluates the different prevalence rates of GDM based on different screening strategies and diagnostic criteria. We also evaluate the importance of performing the 1 hour plasma glucose test when using the IADPSG criteria. Result There is a higher prevalence of diabetes mellitus when universal screening was performed. The lack of 1 hour plasma glucose testing when using the IADPSG criteria may result in under-diagnosis of GDM. Ethnic differences are evident despite using the same diagnostic criteria. Conclusion When adopting the new IADPSG criteria, it is important to perform the additional 1 hour plasma glucose test.

POST-PARTUM FOLLOW-UP FOR MOTHERS WITH GESTATIONAL DIABETES MELLITUS IN A TERTIARY CENTRE IN SINGAPORE

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Background In Singapore, the prevalence of gestational diabetes mellitus (GDM) is at least 8-10%. It is well established that women with gestational diabetes mellitus have a significantly increased risk of developing type 2 diabetes mellitus in the future. There has been much emphasis on achieving good glycaemic control during pregnancy, but inadequate attention on post-partum care. Prevention and early diagnosis of type 2 diabetes mellitus can potentially be achieved with lifestyle intervention and regular surveillance. **Aim** We aim to evaluate the post-partum oral glucose tolerance test (OGTT) compliance rate, as well as to evaluate the prevalence of pre-diabetes and diabetes mellitus at 6-12 weeks post-partum.

Method This is a retrospective study evaluating the post-partum OGTT compliance rates for all patients seen in the gestational diabetes mellitus clinic in Singapore General Hospital from 2013-2014. The incidence of pre-diabetes and diabetes mellitus based on the post-partum OGTT results are also analysed. **Result** There were a total of 307 patients. 116 (38%) patients did not return for their post-partum OGTT test. Out of these patients, 56 (48.3%) did not return for their obstetrics follow-up appointment as well. For those who returned for their OGTT test, 4 (2%) had type 2 diabetes mellitus, 31 (16%) had pre-diabetes, and 156 (81.7%) were normal. **Conclusion** There is a high default rate of 38% for post-partum OGTT. This loss to follow-up could result in a delayed diagnosis of 2-3 patients with diabetes mellitus and 18-19 patients with pre-diabetes.

COMPARISON OF PERINATAL OUTCOMES IN WOMEN WITH TYPE 1 AND TYPE 2 DIABETES

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Background: Type 1 and Type 2 diabetes in pregnancy are associated with increased rates of complications. The aims of this study were to compare rates of serious perinatal outcomes between women with Type 1 diabetes (T1DM) and women with Type 2 diabetes (T2DM) and to explore any predisposing trends in the antepartum period. **Methods:** This retrospective study was conducted in a single centre in Toronto, Canada. Perinatal outcome measures include macrosomia, neonatal intensive care unit admission, neonatal hypoglycemia, neonatal resuscitation, stillbirth, and obstetrical complications. Demographic data including antenatal glycemic control, comorbid hypertension or pregnancy-related hypertension, age, and parity were also extracted. **Results:** 64 women with T1DM and 87 women with T2DM were included. Women with T2DM were older (35 vs 31, $p=0.000$), had greater incidence of comorbid hypertension and hypertensive complications (24.4% vs 11.1%, $p=0.040$), but had overall better glycemic management during their pregnancy. Women with T1DM had worse glycemic control (third trimester hemoglobin A1c 0.067 vs 0.061, $p=0.009$), and their infants had higher rates of macrosomia (32.8% vs 7.9%, $p=0.000$). Rates of elective and unplanned caesarean sections were comparable in both groups of women. Neonatal resuscitation, intensive care unit admissions, and hypoglycemia rates were also comparable. **Conclusions:** Perinatal outcomes in women with T1DM and T2DM are different, with worse macrosomia in T1DM likely driven by poorer glycemic control during pregnancy. Recognizing differences in outcomes due to independent risk factors for both types of diabetes should be considered when providing antenatal care for these women.

EFFECTS of INSULIN PUMP USE ON GLYCEMIC CONTROL DURING LABOUR AND DELIVERY IN TYPE 1 DIABETES.

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Background The methods of insulin delivery for pregnant women with Type 1 diabetes include multiple daily injections (MDI) of subcutaneous insulin and insulin pump therapy. Conventional insulin administration during labour and delivery (L&D) for these women has been intravenous (IV). This study aims to evaluate the safety and efficacy of insulin pump therapy as guided by a pre-printed prescribing protocol during the peri-partum period. **Methods** A retrospective cohort study of patients with Type 1 diabetes followed by the Diabetes in Pregnancy Clinic between January 2011- December 2016, at Sunnybrook Health Sciences Centre. Maternal intrapartum capillary blood glucose measurements were compared between 3 groups: 1) MDI users switched to IV infusion during L&D (MDI), 2) insulin pump users switched to IV infusion during L&D (pump/IV), 3) insulin pump users continued on pump during L&D (pump/pump). **Results** Seventy one eligible pregnancies were screened; 22 in MDI, 11 in pump/IV, and 9 in pump/pump were included, who had five or more peri-partum capillary blood glucose levels documented. There were no significant differences in the mean and median glucose values, percentage of blood glucose values within target range, and percentage of blood glucose values within hypoglycemic range, between the three groups. **Conclusions** Limited by small sample sizes due to low numbers of intrapartum glucose levels, this study did not demonstrate any difference in intrapartum glycemic control. Larger studies are warranted to confirm the benefits of remaining on insulin pump therapy.

ANALYSIS OF THE MAIN RISK FACTORS FOR GESTATIONAL DIABETES DIAGNOSED WITH INTERNATIONAL ASSOCIATION OF DIABETES AND PREGNANCY STUDY GROUPS (IADPSG) CRITERIA IN MULTIPLE PREGNANCIES.

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Introduction: The aim is to investigate the proportion of multiple pregnancies with gestational diabetes mellitus (GDM) diagnosed using the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria and to identify the impact of age, body mass index (BMI) and mode of conception on incidence of GDM. **Material and Methods:** This is a single center, retrospective cohort study on 656 multiple pregnancies screened for GDM with 75-grams, two-hour oral glucose tolerance test at 24-28 weeks of gestation. **Results:** The incidence of GDM in our population was 15.1%. When patients who conceived through heterologous assisted reproduction technology were compared with those who conceived spontaneously there was a significant difference for GDM (31.1% vs 13.6%, p0.001, OR 2.86). A similar finding was also observed comparing egg donation IVF/ICSI patients with homologous IVF/ICSI patients (31.1% vs 14.8%, p=0.006, OR 2.59). Incidence of GDM was significantly higher in obese than in non-obese patients (42.5% vs 14.8%, p0.001, OR 4.88) and in women over 35 compared to younger patients (18.4% VS 11.1%, p=0.01, OR 1.81). **Discussion:** Our data support the role of age, BMI and mode of conception as risk factors for GDM in multiple pregnancies.

ROLE OF FIRST TRIMESTER HbA1c AS A PREDICTOR OF ADVERSE OBSTETRIC OUTCOMES IN A MULTI-ETHNIC COHORT.

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Background: risk of obstetric complications increases linearly with rising maternal glycaemia. Testing HbA1c is an effective option to detect hyperglycemia but its association with adverse pregnancy outcomes remains unclear. Emerging data sustains that an early HbA1c \geq 5.9% could act as a pregnancy risk marker. Objective: to determine, in a multi-ethnic cohort, the usefulness of a 5.9% first-trimester HbA1c threshold to identify women without diabetes at increased pregnancy risk. Materials and methods: a prospective study was conducted between April 2013-September 2015. All women had an HbA1c measurement added to their first antenatal bloods and were screened for gestational diabetes mellitus (GDM) at 24-28 weeks' gestation. Primary outcome was macrosomia. Secondary outcomes were pre-eclampsia, preterm birth and Caesarean section rate. Results: 1228 pregnancies were included for outcome analysis. Women with HbA1c \geq 5.9% (n= 47) showed a higher rate of macrosomia (16.7% vs. 5.9%,p= 0.008) and a tendency towards higher rate of preeclampsia (9.32% vs. 3.9% ,p= 0.092). There were no significant differences in other pregnancy outcomes. After adjusting for potential confounders an HbA1c \geq 5.9% was independently associated with a three-fold increased risk of macrosomia (95% CI: 1.127-8.603,p= 0.028) and preeclampsia (95% CI: 1.086-11.532,p= 0.036). Conclusions: in a multiethnic population, a cut off point of HbA1c 5.9% in early pregnancy identifies a group of women at high risk for poorer pregnancy outcomes independently of GDM diagnosis later in pregnancy. Further studies are required to establish cutoff points adapted to each ethnic group and to assess whether early detection and treatment are of benefit.

AN AUDIT OF STILLBORN BABIES IN MOTHERS WITH DIABETES MELLITUS AT A TERTIARY SOUTH AFRICAN HOSPITAL

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Objective and Design: A retrospective audit spanning 6 years following the implementation of a new guideline on the management of diabetes in pregnancy. The aim was to describe the patient profile of all pregnancies complicated by diabetes and stillbirth. Setting: Tygerberg Hospital, Cape Town, South Africa, a tertiary and secondary referral centre. Subjects: Fifty-nine pregnancies were complicated by stillbirth (500g). Outcome measures: The patient profile, gestational age, co-morbidities, fetal/placental monitoring and avoidable factors. Results: Many patients (34%) booked after 24 weeks' gestation and missed appointments were common (26.2%). Stillbirths ascribed to diabetes constituted 2.4% of all stillbirths at the hospital during the study period. Of the stillbirths 29.3% had Type I DM, 63.8% had Type II and 6.9% were in patients with gestational diabetes. The median HbA1c at delivery was 8.35% (range 6.0-14.1%). In the Type II group, 31 (77.5%) of the stillbirths occurred after 36 weeks, while those among the Type I cases ranged from 21 to 38 weeks. Conclusion: Stillbirths amongst pregnant women with diabetes constituted a small percentage of the total stillbirth burden. Emphasizing the importance of antenatal care to women with diabetes and increased surveillance from 36 weeks' gestation may lower the number of stillbirths.

EXPERIENCE SHARING OF GDM – WDF 14-896 PROJECT PAKISTAN MASS MEDIA CAMPAIGN FOR TIMELY DETECTION, MANAGEMENT AND PREVENTION OF GDM IN PAKISTAN

(2015 – 2018)

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Pakistan has a high prevalence of diabetes, with more than 7 million people affected by diabetes and 23% of GDM incidence. Punjab, Sindh and Baluchistan have indicated a higher prevalence of Type 2 diabetes and Impaired Glucose Tolerance (IGT) in Pakistani women due to insufficient Diabetes care and prevention. In order to reduce the rising burden of diabetes in Pakistan, we applied to WDF 14-896 project to address the issue of increasing GDM incidences and to increase GDM awareness among medical professional and reproductive age women in rural settings. It is a three-year Pan-Pakistan project, covering three provinces. Three Project Management Offices were established in the main cities of Sindh, Punjab and KPK provinces which were mainly responsible for monitoring, screening and postpartum follow-up. Regional GDM advocacy forums and DIP clinics were identified. Four hundred and fifteen doctors and healthcare professional (hcp) were surveyed via knowledge-based (KAP) qualitative survey. Furthermore, out of 12000 women, 2000 female were screened for GDM from which 458 women were diagnosed as GDM. Moreover, 150 massive awareness campaigns and lectures for community were also carried. Twenty-five thousand messages via mobile were sent throughout Pakistan. Ten radio and twelve TV shows went on air as well electronic media was used to spread the one minute video related GDM screening three times during pregnancy. To increase the scope of awareness in general public, the many volunteers mainly from medical colleges joined the awareness campaigns, publication of pictorial and colorful posters and brochures and mobile marketing unit activity was carried out covering 12 smaller districts of each provinces.

The important part of this project is the postpartum follow up of mother and child which have not been done by other WDF projects in Pakistan. In view of our previous project, we intend to follow women up to 5 years to assess mothers who may develop Type 2 diabetes later following a GDM pregnancy.

GESTATIONAL DIABETES MELLITUS - WHAT TO EXPECT?

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Introduction: Pregnancies complicated by Gestational Diabetes Mellitus (GDM) are associated with increased maternal and fetal complications. Maternal, nutritional, metabolic and fetal surveillance depends on the timing of GDM diagnosis. The authors evaluated and compared obstetrical and neonatal outcomes in pregnancies with first vs second trimester GDM. **Methods:** A three-year review of patient charts with GDM who delivered at our hospital was performed. Multiple gestations were excluded. Demographic variables, obstetrical and family history, treatment regimens, pregnancy complications and neonatal outcomes were evaluated and compared in two groups (G1 - Women with first trimester GDM - vs G2 - women with second trimester GDM). **Results:** Among a total of 507 women, 192 (37.9%) were in G1 and 315 (62.1%) in G2. Women in G1 had a significantly higher pre-conception body mass index and most had at least one previous child. An earlier implementation of

nutritional therapy led to a significantly lower weight gain during pregnancy in G1 but drug therapy was frequently necessary to achieve metabolic control. Similar results were obtained between both groups in terms of family history, previous pregnancies with GDM or macrosomia, pregnancy complications or neonatal outcomes. A higher gestational age at delivery was seen in G2. Discussion / Conclusion: Obesity plays an important role in GDM which was reaffirmed in our study. First trimester GDM is associated with greater metabolic imbalance leading to a higher need for pharmacologic treatment. This dictates an earlier induction of labor, due to greater maternal and fetal risks, therefore reducing gestational age at delivery.

INSULIN OR METFORMIN IN GDM MANAGEMENT? - A THREE-YEAR EXPERIENCE OF A SINGLE MATERNITY

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Introduction: Gestational Diabetes Mellitus² (GDM) management has changed over the last years. Metformin in an effective oral anti-diabetic drug increasingly used in pregnancy. Several studies have demonstrated a better metabolic control with metformin without increased maternal or neonatal morbidity. Methods: A three-year retrospective study in single pregnancies with GDM was performed. Maternal and fetal variables were recorded after analysis of clinical charts. Women were stratified into two groups: G1 - insulin management, G2 - metformin management. Multiple pregnancies or those with absent neonatal outcomes were excluded. Results: A total of 266 women were included: 156 (58.6%) treated with insulin and 110 (41.4%) with metformin. In G2 women had higher pre-conception body mass index (BMI) ($p=0.029$) and lower weight gain during pregnancy ($p=0.049$). Family and obstetrical history was similar between both groups. In 56 women treated with metformin it was necessary to associate insulin to achieve greater metabolic control. Minor congenital malformations (7.3% vs 1.3%, $p=0.001$) were significantly higher in women treated with metformin - 3 of cardiovascular system and 1 of central nervous system. Pregnancy-induced hypertension was more frequent in G2. Discussion / Conclusion: Women with higher pre-conception BMI benefit the most from oral anti-diabetics since they induce a better glycemic state and an excellent weight control. Our results on congenital malformations and hypertensive complications in G2 are opposite to recent trials. However, the total amount of cases is still small needing a larger sample in order to provide data for a sound recommendation on GDM management.

MATERNAL GLUCOSE MEASURED BY S.C. CONTINUOUS GLUCOSE MONITORING IS ASSOCIATED WITH FETAL US BIOMETRIES, MAINLY WITH FAT MEASUREMENTS IN THE AREA OF SHOULDERS

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Background and aims To study the association of subcutaneous continuous glucose monitoring (CGM) with fetal ultrasound biometrics in the 3rd trimester. **Materials and methods** CGM ancillary study of the DALI trial. At 35-37 weeks, fetal ultrasound measurements were performed in 58 overweight or obese pregnant women: usual biometrics (BPD, HC, AC, FL), fat and lean mass area in humerus (FMH, LMH), and femur (FMF, LMF), subscapular fat thickness (SFT), abdominal fat thickness (AFT) and liver length (LL). In the same period CGM was performed with an iPro2 device® for 3 days. Independent variables: different CGM summary measures including hourly average glucose, fasting, preprandial and postprandial glucose, percent values within specific ranges and glucose variability and stability indexes. Dependent variables: ultrasound biometrics. Multiple linear regression analysis was performed using variables with a p 0.10 in the bivariate analysis. **RESULTS:** 3-day CGM glucose was 5.49+0.46 mmol/l and birthweight standard deviation score 0.510+1.07. All ultrasound biometrics displayed significant positive associations with CGM summary measures with the exception of LMH. Explained variance after observed R² were in descending order 0.330 for FMH, 0.205 for SFT, 0.198 for FMF, 0.162 for AC, 0.135 for HC, 0.135 for FL, 0.119 for AFT, 0.099 for LL, 0.091 for LMF, and 0.076 for BPD. Different CGM measures were associated with different biometrics. **CONCLUSIONS** Among overweight and obese women, CGM summary measures at 35-37 weeks are positively associated with fetal ultrasound biometrics, mainly fat measurements in the area of shoulders. No single CGM summary measure can be advised.

ASSOCIATION BETWEEN NUTRIENT INTAKE AT EARLY PREGNANCY AND LATER GESTATIONAL DIABETES IN A HIGH RISK POPULATION

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The aim was to analyze the association between nutrient intake and gestational diabetes (GDM). The participants were from the Finnish Gestational Diabetes Prevention Study (RADIEL), a randomized controlled trial with diet and physical activity intervention. All participants were pregnant and were either obese and/or had a history of GDM (n=230). Statistical analysis were Student's t-test and logistic regression analysis. Women who developed GDM (GDM+) during the follow-up had lower BMI compared to women who did not develop GDM (GDM-) (29 kg/m² vs. 33 kg/m² respectively, p=0.001). They were also more likely to have a history of GDM compared to GDM- (60% vs. 25%, p0.001). Nutrient intake was similar between the groups, except for vitamin A (GDM+: 79.9 (SD 26.1) µg/MJ vs. GDM-: 94.7 (SD 43.7) µg/MJ, p=0.03). When adjusted for age, history of GDM, BMI, and group assignment (intervention/control group), increasing vitamin A intake by 10 µg/MJ decreased the odds for GDM by 0.85 (95% CI 0.80; 0.90, p=0.011). When the control and intervention groups were analyzed separately, in the control group GDM+ had lower intake of fiber (10.7 (SD3.3) g/MJ) compared to GDM – (12.6 (SD 3.9 g/MJ, p=0.042). The difference was also significant when adjusted (OR 0.81, 95% CI 0.69; 0.96, p=0.015, adjusted for same variables as earlier). This difference was not found in the intervention group. Intake of vitamin A may be associated with development of GDM. The results support earlier findings; high intake of dietary fiber in early pregnancy is associated with lower risk of GDM.

RISK FACTORS FOR HYPERGLYCEMIA IN PREGNANCY IN THE DALI STUDY DIFFER BY STAGE AND OGTT TIME POINT

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Background and aims: Clinical risk factors are widely used to identify women at risk for Hyperglycemia in Pregnancy (HiP) without distinction by pregnancy stage or OGTT time point. We aimed to analyse risk factors for HiP in different stages of pregnancy and OGTT time points. Materials and methods: 984 pregnant women, recruited to participate in the DALI study for GDM prevention. Glucose tolerance was assessed at 20, 24-28 and 35-37 weeks (IADPSG criteria). Potential predictors addressed were anthropometrics, age, ethnicity, obstetric history, socioeconomic conditions, active smoking, history of impaired glucose tolerance/previous GDM, family history of diabetes, heart rate, center, and intervention (at 24-28 and 35-37 weeks). Statistical analysis: Multivariate logistic regression. Results: Participant characteristics: 86.2% Caucasian, age 32.3 years, pre-pregnancy BMI 33.0 Kg/m². At baseline 27.9% participants had HiP, 15.5% developed HiP at 24-28, and 18.6% at 35-37 weeks. Multivariate logistic regression showed that factors associated with HiP before 20 weeks were neck circumference (OR 1.15), previous glucose intolerance (OR 3.11), previous GDM (OR 2.22), heart rate (OR 1.03) and center (ORs not shown). At 24-28 weeks these factors were previous stillbirth (OR 2.92), heart rate (OR 1.05), and center. In late pregnancy, only maternal height (OR 0.96) was associated. Remarkably, different factors predicted HiP at different OGTT time points (e.g. before 20 weeks, neck circumference was associated with plasma glucose over the positivity cut-off at fasting but not after glucose load). Conclusion: In this population, clinical risk factors for HiP differ by stage of pregnancy and OGTT time points.

GLYCEMIC FEATURES OF GESTATIONAL DIABETES BY THE WORLD HEALTH ORGANIZATION 2013 IN EARLY PREGNANCY

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Background: In Japan, gestational diabetes (GDM) is diagnosed at any time during pregnancy if one or more values equals or exceeds thresholds of the new criteria of International Association of Diabetes and Pregnancy Study Group, which is consistent with the World Health Organization 2013 (WHO 2013) recommendation. To date, little is known about glyceimic features of WHO2013-defined GDM, especially diagnosed in early pregnancy. Aims: To investigate glyceimic characteristics of WHO2013-defined GDM in early pregnancy. Methods: We retrospectively reviewed women with singleton pregnancy who underwent perinatal care between 2011 and 2015 in our hospital. All GDM women underwent dietary management and self-monitoring of blood glucose measurements. Insulin treatment was initiated when dietary treatment did not achieve the glyceimic goal. The clinical and metabolic characteristics (insulinogenic index [IGI] and Insulin Secretion-Sensitivity Index-2 [ISSI-2]) were compared between GDM diagnosed in early and late pregnancy (E_GDM and L_GDM). Results: Of 2594 women, 411 (15.8%) were diagnosed to have GDM (E_GDM, 228 [56%] ; L_GDM, 183 [44%]) Levels of IGI and ISSI-2 of L_GDM were significantly lower than those of E_GDM (0.8 ± 0.6 vs 1.1 ± 1.1 , 1.8 ± 0.5 vs 2.0 ± 0.6). The rate of insulin treatment and a median dosage of insulin needed before term was comparable between E_GDM and L_GDM (36% vs 36%, 14 vs 13 unit/day). Conclusions: The insulin requirement for glyceimic control in E_GDM appeared similar to L_GDM, although the latter might have lower level of beta cell function.

FACTORS INFLUENCING GESTATIONAL DIABETES MELLITUS KNOWLEDGE AMONG PREGNANT WOMEN

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Background: Gestational diabetes mellitus (GDM) is a transition prior to type 2 DM. Achieving optimum glycaemic control requires commitment from patients. Objective: To evaluate level of knowledge regarding GDM and influencing factors among pregnant women. Method: A cross-sectional study was conducted at antenatal clinic from June to August 2016 using Self-administered Gestational Diabetes Mellitus Knowledge Questionnaires. Scores range from 0-15, with a total of more than 8 was considered to have adequate knowledge. Socio-demographic and clinical characteristic data such as age, ethnicity, educational level, income, BMI, pregnancies, current and previous GDM status, family history of GDM or DM, history of GDM related fetal outcome and experience in attending talk on GDM was collected. Results: Out of 405 participants, 339 of them completed the questionnaires. Mean age of participants was 30.96 ± 4.19 years old. Two third of participants (61.4%) had tertiary education. A total mean (SD) knowledge was 11.03 ± 2.94 . About 84.5% had adequate knowledge. Factors significantly associated with level of knowledge were age, ethnicity, educational level, current GDM, previous GDM, family history of GDM or DM and had attended talk on GDM ($p < 0.05$). Factors independently associated with adequate knowledge were tertiary education (adjusted OR 3.87, 95% CI 1.44-10.38) and experience in attending talk on GDM (adjusted OR 3.76, 95% CI 1.35-10.45)

Conclusion: Majority of pregnant women attending antenatal clinic in our center had adequate knowledge regarding GDM. Women with higher educational level and attended antenatal classes had a better knowledge. Nevertheless, more commitments are needed to enhance better glycaemic control

THE INFLUENCE OF DIABETES IN PREGNANCY ON MATERNAL AND FETAL LRG1 LEVELS, AND IMPLICATIONS FOR PATHOLOGICAL NEOVASCULARISATION.

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Introduction Aberrant pathological neovascularisation is evident in the placenta of pregnancies affected by maternal diabetes. Leucine-rich alpha-2-glycoprotein 1 (LRG1) is upregulated in retinal pathological neovascularisation. This study aimed to examine LRG1 expression in pregnancies affected by diabetes in pregnancy. Methods Following ethical approval and informed consent, placental tissue, cord serum and maternal serum samples were collected at the National Maternity Hospital. Patient groups included control, gestational diabetes treated with diet, gestational diabetes treated with insulin and pre-existing diabetes treated with insulin. Samples were analysed using Western blot, immunohistochemistry and ELISA. Results Pregnancies that required insulin treatment were found to have significantly increased levels of LRG1 in placental tissue on Western Blot compared to control ($p=0.0061$). There was no significant difference in those who required dietary treatment compared to control. LRG1 was significantly increased on ELISA in maternal serum with diabetes versus control ($p0.0001$). Similarly, LRG1 was increased in cord serum with diabetes versus control cord serum ($p= 0.0008$). When diabetic status was disregarded, LRG1 levels were significantly increased in maternal serum compared to cord serum ($p 0.0001$). Conclusion This demonstrates that there is elevated LRG1 in placental tissue of patients with maternal diabetes controlled with insulin, and elevated LRG1 in the maternal and cord serum in pregnancies affected by diabetes. This may indicate a role for LRG1 in placental pathological neovascularisation. This study provides a rationale for further work to determine the potential of LRG1 as a treatment target or biomarker for the complications of diabetes in pregnancy.

INFLUENCE OF BODY MASS INDEX ON PHYSICAL ACTIVITY RATE OF WOMEN WITH OR WITHOUT GESTATIONAL DIABETES MELLITUS

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Objectives: To investigate the influence of Body Mass Index (BMI) in the physical activity rate of women with or without Gestational Diabetes Mellitus (GDM). Methodology: This study was conducted with application of the validated Portuguese version of the Pregnancy Physical Activity Questionnaire (PPAQ) in women with or without diagnosis of GDM. Both groups were stratified according to preconceptional body mass index (BMI). The level of physical activity was measured in *Metabolic Equivalent of Task* (MET) in the preconceptional period, third trimester of pregnancy and three months after the delivery. Results: The physical activity rates in the usual risk groups with normal and altered BMI (overweight or obese) and groups of GDM with normal and altered BMI in the preconceptional period were, respectively, 0.82, 0.99, 0.83 and 0.8 METs. In the third gestational trimester, the averages were, respectively, 0.65, 0.76, 0.73 and 0.71 METs. At the three-month

postpartum evaluation, the results were 1.03, 1.07, 1.08 and 1.06 METs. The postpartum period determined higher levels of physical activity when compared to the pre-gestational and gestational periods, regardless of stratification of BMI and the identification of GDM. Conclusion: The physical activity rate was not influenced by the BMI and the diagnosis of GDM. Nevertheless, it suffered interference from the temporal evolution, with increased physical activity in the postpartum period. Keywords: Physical activity level, Pregnancy, Gestational Diabetes Mellitus, Body Mass Index

MOLECULAR CHANGES IN THE GLUCOKINASE GENE ASSOCIATED WITH THE DIAGNOSIS OF MATURITY ONSET DIABETES OF THE YOUNG (MODY) IN PREGNANT WOMEN AND NEWBORNS

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Introduction: Maturity Onset Diabetes of the Young (MODY) is caused by a defect in insulin secretion, which is determined by the autosomal dominant inheritance. Mutations in the Glucokinase gene (GCK gene) cause a defect in glucose signal transduction to β cells with reduced activity, which results in mild and chronic hyperglycaemia. Objectives: To analyze the molecular changes in the GCK gene in pregnant women diagnosed with Gestational Diabetes Mellitus and their neonates. Methods: A cross-sectional study with consecutive sampling that included 128 pregnant women with diagnosis of Gestational Diabetes Mellitus and 72 newborns. Maternal and umbilical cord blood samples were collected at delivery and sent for DNA extraction and polymerase chain reaction to identify molecular changes in the GCK gene. Results: Heterozygous polymorphism in exon 6, position 44708 (g.44708C T) was found in six mothers and seven neonates Heterozygous polymorphism in the promoter region of the gene, position 8450 (g.8450C T) was found in five mothers and two newborns. Probably deleterious mutation, in exon 6, at position 48377 (g.48377C T) was found in one mother and one neonate. The data showed molecular changes in 10.6% of the patients, of whom four were composed of newborn mother binomials. Conclusion: Probably deleterious mutation of MODY GCK was found in 1% of the evaluated pregnant women and neonates. However, the rate of all molecular changes related to this subtype of Diabetes Mellitus was ten times more prevalent. Keywords: Diabetes Mellitus, pregnancy, genetic polymorphism, MODY GCK

PREGNANCY OUTCOME AND MEAN PLASMA GLUCOSE VALUES DURING GESTATIONAL DIABETES

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Background: Hyperglycemia during gestational diabetes (GDM) is known to negatively affect the outcome. The aim of this study was to analyse plasma glucose levels during GDM pregnancy with or without insulin treatment in regard to pregnancy outcome. Methods: All women with GDM during 2012-13 in our region in Sweden (n=200) were included in this study. After GDM diagnosis they were instructed to take 7-point plasma glucose profiles each day. If the goal of 4-8 mmol/L and fasting values 5.5 mmol/L was not reached insulin treatment started. Results: Mean p-glucose during pregnancy did not correlate to infant birth weight but correlated to mother's weight at delivery (n=192; p= 0.013) as well as the amount of insulin in insulin treatment women (n=86; p=0.001). Among insulin

treated women there was a significant correlation between HbA1c and birthweight ($p=0.013$) not seen in the group without insulin. Insulin treated women had significantly higher mean plasma glucose values; 6.7 mmol/l vs 6.0 mmol/l ($p<0.001$), higher mean HbA1c during pregnancy; 38.3 vs. 33.9 ($p<0.001$), and gave birth to significantly larger infants; 3562 vs 3389 gram ($p=0.044$), than women without insulin treatment. No difference was found in pregnancy duration (275.0 vs. 274.5 days) or Apgar at 10 minutes. The Caesarean delivery rate was 29.5% among insulin treated and 27.5% among non-insulin treated women ($p=ns$). Conclusion: The negative effects of hyperglycemia on pregnancy outcome seem to be reduced, in this limited material, to small or non-significant differences with adequate management and treatment.

MANAGING DIABETES IN PREGNANCY USING TECHNOLOGY TO IDENTIFY FALSIFIED OR INVENTED HOME BLOOD GLUCOSE READINGS

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The National Pregnancy in Diabetes NPID Audit (2014) displayed how improved glycaemic control in diabetes in pregnancy improves outcomes for the mother and the baby. However Kendrick et al (2005) reported that that 22% of women invent and falsify their home blood glucose monitoring readings. The advance of technology based interventions can help to improve glycaemic control and self efficacy (Bartholomew et al 2015). The meter content from 200 pregnant women were uploaded and results compared to the women's self reported home glucose recordings. When the printouts from the 200 meters downloaded were compared to the patient's home blood glucose monitoring records, four out of the 200 women were identified as falsified readings. Mean age of the women was 26 years, with a mean gestational age of 27 weeks. Two of the women had type 1 diabetes, one had type 2 diabetes and one had gestational diabetes. The women agreed to attend the Registered Advanced Midwife Practitioner (RAMP)-led clinic on a weekly basis, where their home blood glucose meters were downloaded and treatments titrated accordingly. The mean HbA_{1c} for the group went from mean 66 mmol/ mol (8.2%), to 54 mmol/ mol (7.1%), showing improved glycaemic control in pregnancy. The four women in this sample reported improved satisfaction with their diabetes in pregnancy care. Downloading of blood glucose meters at every consultation ensured less falsification of blood glucose monitoring readings and improved the women's understanding of the need for optimal glycaemic control in pregnancy.

FACTORS AFFECTING MATERNAL SELF-ESTEEM IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Background and aims Maternal self-esteem is an essential component of mothering. Low levels of maternal self-esteem have been associated with diabetes self-management. The purpose of this study was to examine the factors affecting maternal self-esteem in women with gestational diabetes mellitus (GDM). Methods A study of 76 GDM women and 280 non-GDM women was conducted in 2015-2016 in Japan. The women were surveyed using the Prenatal Maternal Self-Report Inventory, Social Support Scale, Prenatal Attachment Inventory, and State-Trait Anxiety Inventory A-state. Statistical analyses were performed using statistical software SPSS version 22 for Windows. This study was

approved by the ethics committee of the University of Tsukuba, Japan. Results Of the 76 women with GDM, the mean age was 33.5 (SD=4.7) years, the mean HbA1c level was 5.2 (SD=0.3) %, and the percentage treated with insulin was 7.9%. Maternal self-esteem was significantly lower in women with GDM than in women without GDM (p<0.05). Anxiety ($\beta=-.344$, p. 01), attachment ($\beta=. 360$, p. 01), parity ($\beta=. 398$, p. 01) and parental support ($\beta=. 273$, p. 01) were significant predictors of maternal self-esteem in GDM women. A multiple regression model explained the 52% variance in maternal self-esteem.

Conclusion Women with GDM have a greater likelihood of obstetric and neonatal complications and the onset of type 2 diabetes. These threats to health may affect the maternal self-esteem. Healthcare providers should strive to reduce health anxiety about GDM and improve maternal self-esteem.

MATERNAL AND FETAL OUTCOMES IN TWIN PREGNANCIES: A COMPARISON BETWEEN WOMEN WITH AND WITHOUT GESTATIONAL DIABETES

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Background: Twin gestations represent high-risk pregnancies, with increased risk of prematurity, ICU admission, and low birth-weight. Women with gestational diabetes (GDM) are also high risk, with increased rates of macrosomia, prematurity and neonatal hypoglycaemia. There is limited evidence in the literature regarding pregnancies affected by both GDM and multiple pregnancies. **Aim:** To assess the difference between maternal and fetal outcomes of twin pregnancies with and without maternal GDM. **Methods:** De-identified demographic and birth data was retrospectively collected for all women who delivered twins between 2011-2015 at an Australian tertiary centre. The population was divided into two cohorts according to maternal GDM status, and the neonatal and maternal outcomes of the two compared. **Results:** A total of 810 twins were identified, with 99 (24%) mothers with GDM and 311 (76%) without GDM. Data analysis showed that twins of mothers with GDM have a greater risk for prematurity (p=0.03), neonatal hypoglycaemia (p=0.01), mean neonatal length of stay (0.002) and admission to a neonatal intensive care unit (p=0.01). Mothers of twins with GDM were more likely to have a higher pre-pregnancy BMI (p=0.022) and hypertension/preeclampsia (p=0.001) compared to those without GDM. There was no difference in perinatal deaths, birth weight, risk of low Apgar score or need for emergency Caesarean section. **Conclusion:** Although there is no significant difference in mode of delivery or perinatal mortality, twin pregnancies complicated by GDM confers a higher risk of certain neonatal and maternal morbidity. More careful monitoring of these women during the antenatal period may be warranted.

GESTATIONAL DIABETES PREVALENCE AND RISK AMONG ETHNIC MINORITIES IN AMSTERDAM

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Introduction Ethnicity is used in many countries to screen women at risk for Gestational Diabetes Mellitus (GDM). We aimed to assess ethnic differences in GDM prevalence in the Netherlands. **Methods** Gestational diabetes was based on self-reporting, pregnancy files, and Dutch Perinatal Registration data in the Amsterdam Born Children and their Development study (ABCD): a

prospective multi-ethnic birth cohort. Comparisons between ethnic minority groups and the Dutch were made using logistic regression with adjustments for potential covariates. Results The cohort consisted of 8266 pregnant women living in Amsterdam between 2003 and 2004 for whom GDM status and ethnicity was available. The prevalence rates of GDM were: Dutch 0.6%, Suriname-Hindu 6.9%, Suriname-Creole 3.5%, Antillean 1.0%, Turkish 1.0%, Moroccan 1.4%, Ghanaian 6.8%, other Sub-Saharan African (SSA) 3.5%, other Western 0.5% and other non-Western 2.4%. After adjustment for age, pre-pregnancy body mass index and education, odds ratios (OR) of GDM were significantly higher in Suriname-Hindu (OR:11.8; 95% CI, 5.18-26.90), Ghanaian (8.0; 3.67-17.52), Suriname-Creole (4.4; 2.00-9.50), other SSA (5.1; 1.75-14.73), and other non-Western women (3.8; 2.00-7.48). There was no significant increased OR for Turkish (4.4; 0.47-4.55), Moroccan (2.0; 0.86-4.40), Antillean (1.3; 0.17-10.25) and other Western women (0.9; 0.32-2.25). Conclusion This study demonstrated higher rates of GDM in ethnic minority women. In particular, our findings qualify SSA pregnant women for inclusion in risk based GDM screening strategies.

GESTATIONAL DIABETES IN PORTUGAL: THE RELAVANCE OF THE NATIONAL DATABASE

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Introduction: In Portugal we have a national database collect by the health care providers of women with GDM. This is an important tool for monitoring and evaluation the management of GDM.

Objective: To compare maternal and neonatal outcomes in 2008 and 2014. **Results:** There was an increase in the prevalence of GDM (3.4%vs6.7%), maternal schooling (29.5% vs 38.4% university level) and maternal obesity (22.5vs26.5 (p 0.05), insufficient weight gain in pregnancy (34% vs. 42%, p 0.05) and insulinization rate (26.4%vs.47.2%, p 0.001). There was a significant decrease in the week of diagnosis from 30.7 to 24.4 (p 0.05). There were no changes in maternal age, family history of diabetes or obstetric complications. Regarding the gestational age of delivery, a significant increase in deliveries at 39 weeks (33%vs51%, p0.01) and a reduction in the cesarean section rate (43.3vs34.5, p 0.001) were reported. There was a significant decrease in LGA and a significant increase in SGA. The percentage of cases without reclassification has been constant over the years (about 30%).

Conclusions: Some of these results (a high rate of insulinization, insufficient weight gain and an increase in SGA) led to a reappraisal of procedures and changes in the prenatal surveillance of these pregnant women, particularly in relation to capillary glycemia targets, the use of oral hypoglycemic agents and the criteria of labor induction and delivery. Our database has proven useful in the assessment of therapeutical and other medical management procedures with the ultimate goal of improving prognosis of these pregnancies.

GESTATIONAL DIABETES: ASSOCIATION BETWEEN FETAL-MATERNAL OUTCOMES AND PRE-PREGNANCY BMI.

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OBJECTIVE To assess the pregnancy outcomes of women with GDM according to pre-pregnancy BMI and to evaluate if different BMI could predict fetal-maternal outcomes **STUDY DESIGN** We retrospectively reviewed all the charts of women with GDM singleton pregnancy followed in our clinic between 01/01/2012 and 01/09/2016. The diagnosis of GDM was done with at least one positive value at OGTT. The women were divided in two groups according to pre-pregnancy BMI: women with pre-

pregnancy BMI \geq 30 (N=110) and women with pre-pregnancy BMI \geq 30 (N=400). Maternal and neonatal outcomes were compared between the 2 groups. Data were analyzed by t-test, and Fisher Exact test; p \leq 0.05 was considered significant. RESULTS The obese women with GDM more frequently required insulin therapy (40/105vs63/378,p 0.001), were more frequently induced (52/75vs168/305,p0.008) and had significantly lower gestational age at birth (38.1vs38.4,p0.03). Women with BMI \geq 30 had a significant lower rate of vaginal delivery (69/110vs276/400,p0.04), a higher rate of cesarean section (CS) in labor (41/110vs34/400,p 0.001) and they required an increase number of epidural analgesia during labor (20/68vs129/281,p0.009). We found a statistically difference in hispanic women between the two groups (14/110vs15/400; p=0.01). No differences were found in maternal age at delivery, elective CS and adverse neonatal outcomes (LGA neonates, umbilical artery pH 7.10, Apgar 7 at 5'). CONCLUSION Obese women more frequently required insulin therapy, had a higher risk of induced labor and urgent CS. Clinicians must be aware that obese women with GDM may require an increased standard of care during pregnancy and at delivery.

MYSWEETGESTATION[®]: THE DIABETES AND PREGNANCY APP

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“MySweetGestation” is a Web application designed as a reference tool by the Italian SID-AMD “Diabetes and Pregnancy” Study Group. The goal is to give useful and controlled information on the recognition and treatment of diabetes in women who wish to plan pregnancy or who already are pregnant, according to the Standards of Care of the main scientific societies. Through interactive screens, it contains information on the main aspects of diabetes and pregnancy (nutritional and insulin therapy, ketones monitoring, management and follow-up after delivery etc.) and on the risks and proper practices to be conducted in order to prevent maternal-neonatal adverse outcomes related to hyperglycemia. At variance with previous published web applications on the topic, it is designed to “engage” the user by using short questionnaires on the anthropometric characteristics of the patients, on the risk factors for developing gestational diabetes and on the oral glucose tolerance test assessment. Once completed, each interactive part gives to the user an easy to interpret informative feedback. The APP also contains an obstetrical section that offers the possibility to estimate the fetal weight on the basis of the ultrasound measurements and to track the movements of the baby by using the Cardiff fetal movement chart. Beside the women-centered section, MySweetGestation also contains a healthcare giver section that provides more technical information on the management of pre-gestational and gestational diabetes getting into the most updated guidelines. In conclusion, despite “MySweetGestation” cannot substitute physician’s management, it can be a reassuring support for women and their caregivers.

ARE INCREASED URIC ACID LEVELS IN PREGNANCY COMPLICATED BY GESTATIONAL DIABETES MELLITUS LINKED TO IMPAIRED GLUCOSE TOLERANCE?

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Introduction: Increased uric acid (UA) levels were associated with obesity, hypertension and insulin resistance. Moreover serum UA levels show substantial genetic component. We hypothesize that increased UA in pregnancy can serve as a marker of more severe insulin resistance leading to high-risk gestational diabetes mellitus (GDM) and, hypothetically, to diabetes development soon after delivery. We therefore assessed UA levels during pregnancy and *postpartum* in a group of women with GDM and healthy pregnant counterparts and associated them with a severity of carbohydrate abnormalities in the 2nd trimester and other adverse outcomes. **Methods:** A total of 143 women were included in the case-control study (of those 109 with GDM diagnosed according to WHO criteria). All subjects underwent oral glucose tolerance test (75g of glucose between 24-30th week of pregnancy). UA levels were determined by reversed-phase HPLC-UV. Several SNPs in UA transporters were genotyped using commercial PCR-based assays. **Results:** UA levels were higher in GDM defined as high-risk (need for insulin in GDM therapy, abnormal foetal growth, pre-gestational BMI 30, weight gain during pregnancy 20 kg or hypertension) (P=0.02, Mann-Whitney). Statistically significant correlations between UA levels and pre-gestational BMI and glycaemia levels during pregnancy were found (all P<0.05, Spearman). We have described genotype-phenotype associations between SNPs in UA transporter GLUT9 (*SLC2A9* gene) and UA levels. **Conclusions:** Our data support a possible link between obesity, increased UA levels and the risk of GDM development. UA levels were significantly higher among women with high-risk GDM potentially indicating risk of *postpartum* glucose abnormality (study ongoing).

ASSOCIATION OF MTNR1B AND GCK POLYMORPHISMS WITH GESTATIONAL DIABETES RISK IN RUSSIAN WOMEN

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Background: Genome-wide association studies (GWAS) have identified the relationship of single nuclear polymorphisms (SNPs) of MTNR1B and GCK with type 2 diabetes susceptibility. Data on the association of these SNPs with the development of gestational diabetes mellitus (GDM) are contradictory and genetic determinants may vary in different populations. The aim of our study was to investigate the relation of SNPs in MTNR1B and GCK with GDM risk in Russian women. **Materials and methods:** We performed a case-control study of 306 GDM cases and 204 controls to evaluate the association of SNPs rs10830963 and rs1387153 in MTNR1B and rs1799884 in GCK with GDM. The diagnosis of GDM was based on IADPSG criteria. **Results:** Logistic regression analyses showed significant associations of G allele of the rs10830963 and T allele of the rs1799884 with an increased risk of GDM that remained significant after adjustments on age and pre-pregnancy BMI [adjusted OR (95% CI) = 2.08 (1.39-3.11) for rs10830963, p<0.001; and adjusted OR (95% CI) = 2.11 (1.33-3.35) for

rs1799884, $p=0.002$). T allele of the rs1387153 showed an association with GDM ($p = 0.001$) that was lost after multiple adjustments ($p=0.5$). Combination of the risk alleles of the three SNPs further increased the risk of GDM [adjusted OR (95% CI) = 3.31 (1.76-6.33), $p0.001$], when compared to individuals without carrying any risk allele. Conclusion: MTNR1B and GCK variants are associated with an increased risk of GDM in Russian women.

POTENTIALLY MODIFIABLE PREDICTORS OF ADVERSE NEONATAL OUTCOMES IN PREGNANCIES COMPLICATED BY GESTATIONAL DIABETES

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Background: The aim of the study was to identify potentially modifiable clinical predictors of adverse neonatal outcomes.

Methods: This prospective cohort study included 232 pregnant women with GDM followed in a tertiary hospital between 4/2012 and 3/2016. Predictors included prepregnancy BMI, gestational weight gain, oral glucose tolerance test (oGTT) results, treatment modality, fetal estimated weight by ultrasound (US) and HbA1c at the end of the pregnancy. Neonatal outcome variables included BMI, macrosomia, hypoglycemia (glycemia 2.5 mmol/l) and neonatal unit hospitalisation. Data were analysed adjusting for sex and gestational age. Results: BMI before pregnancy was 26.4 ± 5.2 kg/m² and gestational weight gain 13.1 ± 6.1 kg. 49.8% of the women were treated with insulin, 6.8% with metformin and 3.4% with both. HbA1c at the end of the pregnancy was $5.6 \pm 0.4\%$. The mean gestational age was 38.9 ± 1.8 weeks and the rate of cesarian delivery 39%. Birth weight was 3261.1 ± 576.7 g and BMI 13.6 ± 1.6 kg/m². 7% had macrosomia, 12% hypoglycemia and 10.1% were transferred to a neonatal unit. Predictors of increased neonatal BMI were pregestational maternal BMI and gestational weight gain, US-estimated weight and HbA1c at the end of the pregnancy. Weight gain and US-estimated weight also predicted macrosomia (all $p0.05$). Hypoglycemia was predicted by the 2h oGTT values and neonatal hospitalisation inversely by US-estimated weight (all $p0.05$). Treatment modality did not predict any outcomes (all $p=NS$).

Conclusion: Weight-related and metabolic parameters such as HbA1c, but not the treatment modality, predicted adverse neonatal outcomes.

DESIGN OF A DIGITAL GESTATIONAL DIABETES PREVENTION PROGRAMME

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Background: Diabetes prevention is critical for women with gestational diabetes mellitus (GDM), which affects 5–10% of pregnancies. GDM is one of the strongest risk factors for the development of type 2 diabetes: up to 7 in 10 women diagnosed with gestational diabetes develop type 2 diabetes within 5 years of the birth. However, women do not receive sufficient support. Aim: Our aim was to develop a digital education and monitoring programme to assist in the prevention of GDM and post-partum complications. Methods & Results: Desmond-qualified dietician developed an educational programme on balanced diet and weight management. The course consists of ten core lessons on nutritional topics including fad diets and mindful eating. A team of four post-PhD data scientists from the S2DS, largest European data-science school developed an intelligent algorithm that uses machine

learning principles to provide recipes and food shopping lists for women based on their recommended dietary intake and food preferences. The digital programme also includes a daily monitoring system of sleep, activity, vital health and the menstrual calendar as these are closely related hormonal disturbances. In addition, tailored peer-to-peer support groups were designed to facilitate behavioural change.

Discussion: It is well accepted that women in the post-partum period will unlikely have sufficient time to attend face-to-face consultations and leading scientific bodies have encouraged the development of digital prevention programmes. However, to date, there is no clinically proven digital diabetes prevention programme for women with GDM and further clinical trials among diverse populations are needed.

A CASE CONTROL STUDY OF PLACENTAL PATHOLOGY IN WOMEN DIAGNOSED WITH HYPERGLYCEMIA BEFORE AND DURING PREGNANCY

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Purpose: To evaluate placental abnormalities in pregnancies affected by diabetes compared to control group with euglycemia, from a single academic center Methods: This is a retrospective study on patients from 1/1/2007-12/31/2016. Data was collected through review of medical delivery records. We evaluated 12 elements from the placental pathologic report. Placentas from pre-gestational (type 1 and type 2) and gestational diabetes were evaluated and compared with placentas from pregnancies without this diagnosis. Results: Pathology reports of 600 placentas and the corresponding medical records were reviewed. Patients were divided into two groups, diabetes group (Group1) n=494 (pre-gestational = 188, and gestational = 294) and control (Group 2) n= 106. Group 1 subjects were older [30(6) vs 28(6); p0.0001], had higher gravidity [3 vs 2; p0.0001], larger BMI at delivery [38(9) vs 32(8); p0.0001], delivered at an earlier gestational age [37(3) vs 39(2); p0.0001], had a higher rate of chronic hypertension [31.8% vs 3.8%; p0.0001], and gestational hypertension [7.4% vs 2.8%; p0.0001] compared to Group 2. Out of 12 histologic elements investigated between groups, delayed (8.3% vs 1.9%; p0.0001) or accelerated (10.1% vs 0.9%; p0.0001) villous maturation and increased placental weight (22.5% vs 9.4%; p0.0001) were the only statistically significant findings noted to be increased in Group 1. Conclusions: Placentas of pregnancies complicated by diabetes display villous maturation abnormalities, a measure of hypoxia, much more frequently than placentas from pregnancies without this diagnosis. The increased incidence of obesity and hypertensive disorders commonly found in this group may have contributed to this finding.

MINOR ALTERATIONS OF GLUCOSE METABOLISM: THE FLAT OGTT AND ITS EFFECTS ON FETAL GROWTH

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Introduction It has been hypothesized that an enhanced insulin response can influence fetal growth. This altered response

would result in a reduction of physiological post prandial glycemic peak and thus could lead to compromise fetal growth. This alteration can be detected during the oral glucose tolerance test

(OGTT) and is called "flat curve". **Methods** We performed a retrospective study on 18376 women. Of these 1294 (7%) were excluded because had a multiple gestation and 114 (0.7%) for pregestational diabetes. 6517 (38.1%) were not screened for gestational diabetes, 1933 (11.3%) had a positive screening and 8518 (49.9%) were screened negative and constitute our study group. The aim of our study was to find a cut-off value for defining the "flat OGTT" and verify its effect on pregnancy outcome. **Results** We defined a flat curve an OGTT whose delta between fasting glucose and blood glucose one hour after administration of 75 g glucose was less than 5 mg/dl. In the OGTT negative group we had 494 women with flat curve and 8024 women with delta ≥ 5 who constitute our control group. We found an increased incidence of SGA (11.8% vs 9.0% $p=0.033$ OR 1.36 95% CI 1.03, 1.81) and severe SGA (4.7% vs 2.8% $p=0.019$ OR 1.69 95%CI 1.09, 2.62) in the flat curve group respect to controls. **Conclusion** Our study confirm the results already present in the literature that pregnant women with flat OGTT in pregnancy are at increased risk of SGA.

INSULIN DETEMIR VERSUS GLYBURIDE IN GESTATIONAL DIABETES MELLITUS: A RETROSPECTIVE COHORT STUDY

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Objective: To compare the efficacy and safety of insulin Detemir (IDet) versus Glyburide in Gestational Diabetes Mellitus (GDM), when glycemic control could not be achieved solely by lifestyle modification and diet. **Patients and Methods:** A retrospective cohort analysis of 115 women with singleton pregnancy and GDM who were treated with either IDet or Glyburide. GDM was diagnosed via the "Two Step Procedure" of 50gm, followed by 100gm, OGTT. Maternal characteristics and maternal outcome (pre-eclampsia, weight gain) as well as neonatal outcome (birth weight and percentile, neonatal hypoglycemia, neonatal jaundice and respiratory morbidity) were compared between the two groups. **Results:** 67 women received IDet and 48 received Glyburide. There was no difference in maternal characteristics of both groups. Maternal weight gain and the incidence of PET were similar. Neonatal outcomes were similar apart from the incidence of neonatal hypoglycemia which was significantly higher in the IDet group as compared to Glyburide (37% vs 16.3%, $P=0.018$). **Conclusion:** Glucose control, in women with GDM, by insulin Determir, yielded results similar to glyburide, except for a significantly higher rate of neonatal hypoglycemia.

PRECONCEPTIONAL AMINO ACID PROFILING THROUGH NMR METABOLOMICS IN PREDICTION OF GESTATIONAL DIABETES MELLITUS

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INTRODUCTION: Levels of branched chain (BCAA) and aromatic amino acids predict insulin resistance and type 2 diabetes (T2D). Findings from studies focusing upon the relationship between amino acids (AA) and risk of gestational diabetes (GDM) are inconsistent. **OBJECTIVE:** To assess the relationship between AA levels before conception and development of GDM. **METHODS:** Out of sixty-five women with high GDM risk ($BMI \geq 30$ kg m² and/or prior GDM) and planning pregnancy,

39 developed GDM, and were compared to 26 with normal glucose tolerance (NGT). GDM diagnosis was based on at least one pathologic value at 75 g OGTT performed around 13 and 26 weeks of gestation (ADA 2008 criteria). Targeted nuclear magnetic resonance spectroscopy was used to analyze the concentrations of nine AA from fasting serum samples at enrollment, on average 3.7 (95% CI 2.8 to 4.6) months before conception. RESULTS: Levels of glutamine, glycine, and tyrosine were higher, and valine and phenylalanine lower in the GDM group before pregnancy. We performed principal component analysis where component 1 (PC1) included BCAA and aromatic AA (isoleucine, leucine, valine, phenylalanine, and tyrosine) and component 2 (PC2) other AA (alanine, glutamine, glycine, histidine). Adjusted (age, BMI, fasting glucose, and prior GDM) risk for GDM was 5.1 (OR per 1-SD change [95% CI 1.8 to 14.2]) for PC2 and 0.7 (OR per 1-SD change [95% CI 0.3 to 1.7]) for PC1. CONCLUSIONS: In preconception PC2 (alanine, glutamine, glycine, and histidine) but not PC1 (BCAA and aromatic AA) is related to higher risk of GDM.

THE DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS AFTER BARIATRIC SURGERY: ARE WE OFF TARGET?

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Background: Bariatric surgery (BS) is increasingly being undertaken by obese women prior to pregnancy. No guidelines exist for screening and diagnosis of GDM after BS. Oral Glucose Tolerance Test (OGTT) profiles differ in BS patients, frequently resulting in reactive hypoglycaemia. The utility of the OGTT for GDM diagnosis after BS requires validation and reconsideration. Aims: To determine from the literature published testing methods and diagnostic criteria for GDM after BS, and to explore by survey, current approaches to GDM diagnosis post-BS across Australia. Methods: A literature review identified twelve studies reporting GDM prevalence after BS. A one-page questionnaire was sent to National Association of Diabetes Centres (NADC) and Australasian Diabetes in Pregnancy Society (ADIPS) members to ascertain testing methods and GDM diagnostic criteria being used in BS-treated women. Results: Criteria applied to diagnose GDM were not specified by 75% of studies. Most studies that did, applied OGTT criteria equally to BS women and non-BS women. Nineteen surveys were returned Australia-wide. Gastric Banding was the procedure most commonly encountered. Eleven centres use the OGTT applying ADIPS criteria equally in women with and without a BS history. Five centres use a combination of diagnostic methods. Conclusion: Limitations of the OGTT in GDM diagnosis after BS are under-recognised. OGTT remains the most widely utilised diagnostic test in this context. Examples of alternatives include Continuous Glucose Monitoring, fasting and 2-hour post-prandial glucose levels, HbA1c or a combination at 24-28 weeks gestation. These methods are yet to be tested in clinical trials or endorsed.

GESTATIONAL DIABETES (GDM): RISK FACTORS AND PREVALENCE IN TARTU UNIVERSITY HOSPITAL'S WOMEN'S CLINIC IN 2012 – 2013

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Objectives: To analyse the prevalence of GDM and its risk factors at Women's Clinic of Tartu University Hospital (TUH) in Estonia, and assess the predictive value of each risk factor. Methods: All women (n=1073) who got antenatal care at Women's Clinic of TUH in 2012-2013 were included the study. The known risk factors for GDM were recorded. Oral glucose tolerance test (OGTT) was applied for high-risk pregnant women. The diagnostic criteria for GDM: plasma glucose level: 5.1

mmol/l (fasting), \geq 10 mmol/l (1h), and/or \geq 8.5 mmol/l (2h) at OGTT. Results: 46% of all pregnant women (n=495) had one or more risk factors for GDM: 18.5% of the women were overweight (BMI 25 - 30kg/m²) and 8.6% were obese (BMI \geq 30kg/m²). In addition to obesity the previous GDM and birth of large baby (4.5kg), and random fasting glucose level 5.1mmol/l during the current pregnancy were the significantly related to the GDM (p0.0002, OR10). 1/3 of obese and 15% of overweight women developed GDM. 867 pregnant women (81%) were tested for GDM as recommended in the antenatal care guidelines. Based on OGTT GDM was diagnosed in 52 (6%) cases: in 36 (4.2%) cases at 24-28 weeks and in 16 cases (1.8%) already during the first trimester. 23% of patients with GDM got metformin and/or insulin in addition to diet. Pregnant women with GDM had a higher frequency of fetal macrosomia and premature labor (p0.05, OR= 4.8 and 2.9, respectively). Conclusions The prevalence of GDM was 6% in Women's Clinic of TUH, Estonia.

USEFULNESS OF AMBULATORY BLOOD PRESSURE MONITORING IN PREGNANT WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Gestational diabetes mellitus (GDM) is associated with an increased risk of pregnancy-induced hypertension (PIH). Ambulatory blood pressure monitoring (ABPM) has been used to screen for PIH and preeclampsia. To date, there are no data regarding ABPM in women with GDM. The aim of the study was to establish blood pressure (BP) profiles for pregnant with GDM and determine whether a BP pattern can define a population at risk for developing PIH. We prospectively studied 113 normotensive women with GDM consecutively recruited at 28-32 weeks of pregnancy. ABPM was carried out for one 24-h period on each patient, using the SPACELABS 90207 ABP monitor. Based on nocturnal fall pattern, we established four subgroups: dippers, non-dippers, extreme dippers, and risers. The mean systolic/diastolic BP was 108.9/67 mmHg. By ABPM, 34 (40%) patients were pattern dippers, 3 (3.5%) extreme dippers, 39 (45.9%) non-dippers, and 9 (10.6%) risers. Comparing dipper/non-dippers groups with baseline and metabolic characteristics, BMI was significantly higher in the non dipper group (28vs25.8kg/m², P0.05). We observed higher levels of night-time systolic (105.3 vs 98.8mmHg) and diastolic BP (63.1 vs 57.2mmHg) in non-dippers. Seventy-eight women delivered to date, 3% had preeclampsia and 7% PIH. We concluded that a higher rate of the non-dippers pattern were observed in women with GDM and it seems to be associated with other factors, such as BMI. Thus, higher levels of night-time systolic/diastolic BP could be a useful predictor of PIH. Further studies will be needed to determine the relationships across of BP alterations and baseline and metabolic characteristics, and obstetrics and perinatal outcomes.

RISK FACTORS VERSUS CLINICAL OUTCOMES IN GDM WOMEN

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AIM: To evaluate which risk factor might influence adverse clinical outcomes of GDM METHODS: From 2011, following Italian Minister of Health guidelines, screening for GDM was offered only to pregnant women with at least one risk factor among maternal age \geq 35, BMI \geq 25, ethnic group at risk for GDM, a parent with type 2 diabetes and GDM in a previous pregnancy. In a five-year period 418 diabetic women, with at least one risk factor, were diagnosed after a 75 g Oral Glucose Tolerance Test (OGTT). The adverse pregnancy outcomes considered were macrosomia, gestational hypertension, preterm delivery, Intrauterine Growth restriction (IUGR), caesarean section in emergency, admission to Neonatal Intensive Care Unit (NICU) and neonatal hypoglycaemia. RESULTS AND

CONCLUSIONS: Among risk factors, obesity (BMI \geq 30 Kg/m²) was the most important in influencing almost all adverse outcomes, but also familiarity, ethnicity and maternal age \geq 40 years showed statistically significant correlations. In this sample of GDM women, maternal age \geq 35 years, overweight (BMI \geq 25–30 Kg/m²) and previous GDM failed to show any correlations with adverse outcomes considered.

CHANGING THE CERTIFICATE OF DELIVERY ASSISTANCE TO IDENTIFY PREGNANCIES COMPLICATED BY DIABETES IN ITALY: A PILOT STUDY

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In Italy national pregnancy outcomes in women with diabetes are not available. However, these data are indeed collected on all newborns through the Certificate of Delivery Assistance (CeDAP). Aim of this study was to validate 5 simple closed-answer questions that added to the CeDAP would allow to identify pregnancies complicated by diabetes. From 15/03/2016 to 31/07/2016 we added our 5 questions to the CeDAP used at our hospital. We chronologically reviewed all CeDAP and for each woman identified as having diabetes through the CeDAP (case), we identified as controls the three consecutive women without pre-pregnancy diabetes and with negative GDM screening. The validity of the answers was verified through interview with patients, and review of medical records. Among 777 women who delivered in the study period, we identified through the CeDAPs 65 women with diabetes (8 T1DM, 4 T2DM and 53 GDM). The validation process identified two false positive [2.9% (95% CI: 0.4, 10.2)] and no false negative. There was one case of diabetes misclassification (i.e., a woman with T2DM classified as having T1DM) [1.6% (95% CI: 0.04, 8.2)]. The Cohen's kappa was 0.97 (95% CI: 0.935 to 0.988, p<0.0001), indicating very good agreement. The 5 closed-answer questions added to the CeDAP correctly identified women with T1DM, T2DM or GDM. If added to the CeDAP used nationwide it would be possible to report the outcomes of pregnancies complicated by diabetes in Italy, to support health care policies to improve the outcomes of these pregnancies.

PRENATAL DIAGNOSIS OF FEMORAL HYPOPLASIA-UNUSUAL FACIES SYNDROME ASSOCIATED TO SACRAL HEMIVERTEBRA

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The femoral hypoplasia-unusual facies syndrome, also known as femoral-facial syndrome, is extremely rare. Its pathogenesis is unknown. However, an association between femoral-facial syndrome and insulin-dependent diabetes mellitus during pregnancy has been found in one-third of cases. Proposed diagnostic criteria for this entity include: femoral hypoplasia in association with craniofacial abnormalities; the presence of further defects – such as unilateral renal agenesis or defects on the spine or central nervous system – make diagnosis much more accurate.

We present the case of a pregnant woman with type-2 diabetes mellitus of 17 years of evolution without associated complications. The first-trimester screening ultrasound study revealed a female fetus with remarkable micrognathia and low set ears. All other anatomical findings were normal. On

week 22+4 of pregnancy, ultrasound showed a fetus with severe micrognathia, bilateral femoral agenesis and hemivertebra at the S3-S4 level, associated with skin defect at the same level.

PLEIOTROPHIN HAS A KEY ROLE IN MATERNAL GLUCOSE TOLERANCE, METABOLIC HOMEOSTASIS AND ADIPOSITY DURING PREGNANCY.

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Pleiotrophin, a highly conserved cytokine, exerts different functions including regulation of cell growth, migration and survival, and is expressed in placenta during early mouse development. Our previous results revealed that Ptn is also a key player to preserve insulin sensitivity, lipid turnover and adipocyte plasticity, although no data on its role in pregnancy are available. Thus, to evaluate the role of pleiotrophin in maternal and placental metabolism we used a Ptn-knockout pregnant mice and their corresponding wild-type counterparts. Maternal body weight, adiposity and placental and fetal weights were decreased in the Ptn-knockout pregnant mice. Deletion of pleiotrophin decreased circulating triacylglycerides and NEFA, and impaired lipid accumulation in adipose tissue. Glycemia, glucagon and AUC-G were significantly higher in Ptn-knockout mice than in wild-type, indicating a deterioration of glucose tolerance in these animals.

The metabolomics analysis of placenta showed an increment in non-essential amino acids in Ptn-knockout mice. Moreover, placentas of Ptn-knockout mice have an increased pAMPK/AMPK ratio and higher expression of glycerol kinase and lipin-2, suggesting an increase in triacylglycerides synthesis. However, triacylglyceride content in placenta was decreased in Ptn-knockout mice due to a higher lipolytic activity. Finally, the expression of TNF- α and Cd11c were also found to be increased in placentas of Ptn-knockout mice. In conclusion, our results suggest an altered metabolism of amino acids, increased lipid turnover and a moderate inflammatory state in Ptn knockout placentas, pointing to a key regulatory role of pleiotrophin in glucose and lipid homeostasis, maternal adiposity and placental metabolism during pregnancy.

GLUCOSE HOMEOSTASIS, BETA CELL FUNCTION, AND INSULIN RESISTANCE IN RELATION TO VITAMIN D STATUS AFTER GESTATIONAL DIABETES MELLITUS

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Background and aims: Preliminary data suggest that vitamin D is involved in glucose homeostasis. We wanted to determine vitamin D status after gestational diabetes mellitus (GDM) and to evaluate whether levels of 25-hydroxyvitamin D₃ (25OHD₃) are associated with beta cell function, insulin resistance, or a diagnosis of diabetes after GDM. Material and methods: Glucose homeostasis was assessed during a 75-g oral glucose tolerance test 1–2 years after delivery in 376 women with previous GDM (287 European and 78 non-European). Insulin resistance was estimated using homeostasis model assessment of insulin resistance (HOMA-IR). The insulinogenic index (I/G30) and the disposition index [(I/G30)/HOMA-IR] were used to calculate insulin secretion. Concentrations of serum 25OHD₃ were determined. Results: Mean (\pm SD) 25OHD₃ concentration was 50.0 \pm 22.3 nmol/L and differed significantly among subgroups of body mass index (BMI), ethnicity, and glucose tolerance status; 53% had 25OHD₃ levels 50 nmol/L and 87% had 25OHD₃ levels 75 nmol/L. There

was a negative correlation between 25OHD₃ concentration and HOMA-IR ($p=0.001$) and a positive one between 25OHD₃ and disposition index ($p=0.002$) in univariable regression analysis, but these became attenuated after adjustment for BMI. In univariable regression analysis, 25OHD₃ concentrations were significantly associated with diabetes after GDM ($p=0.004$). However, in a multivariable model non-European origin, HOMA-IR, and insulinogenic index were significantly associated with post-partum diabetes whereas 25OHD₃ concentrations were not. Conclusions: Vitamin D deficiency/insufficiency is prevalent in previous GDM cases. 25OHD₃ levels correlate negatively with insulin resistance and post-partum diabetes, and positively with insulin secretion. These associations are interrelated and are influenced by other factors, such as BMI and ethnicity.

FACTORS ASSOCIATED WITH POSTPARTUM GLUCOSE INTOLERANCE IN PATIENTS WITH GESTATIONAL DIABETES MELLITUS DIAGNOSED BY ABNORMAL FIRST-VISIT FASTING BLOOD GLUCOSE

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Objective: To evaluate the incidence and the prediction factors of postpartum glucose intolerance in patients who presented gestational diabetes mellitus (GDM) diagnosed by abnormal fasting blood glucose (FBG) at first antenatal visit. **Materials and methods:** Observational, retrospective cohort study of pregnant women diagnosed with GDM before 24 gestational week according to International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria who attended antenatal care visits at a tertiary teaching hospital in São Paulo city (Brazil) from 2012 to 2015. Subjects were divided into two groups according to the results of the postpartum glucose tolerance test (normal vs abnormal). Groups were compared regard to clinical and laboratorial data. A logistic regression model was designed to evaluate the capability of the variables in predicting postpartum glucose intolerance. Odds ratio (OR) and 95% confidence interval for OR (95% CI) are presented. **Results:** Postpartum glucose intolerance was observed in 39/230 (17%) of patients. Women who presented glucose intolerance had higher FBG levels at the diagnosis ($p=0.001$), higher glycated hemoglobin values ($p=0.001$) and greater pre-pregnancy body mass index ($p=0.003$). Chronic arterial hypertension ($p=0.030$) and insulin need ($p=0.001$) were more frequent in this group. At the logistic regression model, insulin requirement was the only significant independent variable in predicting postpartum glucose intolerance. If the insulin requirement was excluded from the model, thus the FBG at diagnosis and BMI became significant independent variables. **Conclusions:** In women who presented GDM diagnosed by abnormal first visit FBG, postpartum glucose intolerance can be predicted by the requirement of insulin during pregnancy and by the BMI and the level of FBG at diagnosis.

IMPACT OF MULTI-PROFESSIONAL CARE ON THE REQUIREMENT OF INSULIN FOR GLYCEMIC CONTROL IN PREGNANT WOMEN WITH GESTATIONAL DIABETES - EXPERIENCE AT A BRAZILIAN TERTIARY TEACHING HOSPITAL

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Introduction: In our antenatal care, all pregnant women diagnosed with gestational diabetes (GDM) are referred to an orientation group, composed by a doctor, a nurse and a nutritionist. They receive information about the disease and its treatment. Since 2014, besides this first approach, a nurse performs telephone contacts and appointments to supervise and to advise pregnant women with

difficulty in achieving glycemic control. Objective: To evaluate the impact of multi-professional care during the antenatal care visits on the requirement of insulin for glycemic control in pregnant women with GDM. Materials and methods: Observational, retrospective cohort study with evaluated the requirement of insulin for glycemic control in pregnant women who attended antenatal care visits at a tertiary teaching hospital in Sao Paulo city (Brazil) from January 2012 to December 2015. For analysis of clinical variables, patients were divided into two groups, according to the period in which they underwent antenatal care: 2012-2013 group (no individualized nurse care) and 2014-2015 group (individualized nurse care). Results: 862 pregnant women were included in the study. The requirement of insulin for glycemic control reduced from 34% (162/470) in 2012-2013 group to 21% (82/392) in 2014-2015 group ($p = 0.001$). There was no difference between the groups regarding age, educational level, pre-pregnancy body mass index (BMI), family history of diabetes mellitus (DM), prior GDM or prior fetal macrosomia. Conclusions: In women with GDM, an individualized care is important to improve glycemic control and to reduce the requirement of insulin during pregnancy.

GESTATIONAL DIABETES MELLITUS: COMPARISON BETWEEN PREGNANT WOMEN DIAGNOSED BY ABNORMAL FIRST-VISIT FASTING BLOOD GLUCOSE AND THOSE DIAGNOSED BY CLASSIC 75G ORAL GLUCOSE TOLERANCE TEST

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Introduction: There are controversies about the validity of the International Association of Diabetes and Pregnancy Study Group (IADPSG) consensus regarding diagnosis of GDM, with special concern about those women diagnosed by abnormal fasting blood glucose (FBG) at the first antenatal visit. Objective: To compare clinical and laboratorial profile of women diagnosed for GDM by either the FBG at first antenatal visit or the classical 75g oral glucose tolerance test (GTT) later in pregnancy. Materials and Methods: Observational, retrospective cohort study of pregnant women that attended antenatal care in a tertiary teaching hospital in Sao Paulo city (Brazil) from January 2012 to December 2015. Women were diagnosed with GDM either by abnormal FBG before 24 gestational weeks (FBG group) or by GTT performed after 24 gestational weeks (GTT group), according to IADPSG criteria. Primary outcome was the requirement of insulin therapy to achieve blood glucose targets. Results: A total of 862 women were studied, 408 within FBG group and 454 within GTT group. Among them, 135 (33%) needed insulin therapy in FBG group and 109 (24%) in GTT group ($p=0.003$). Women of FBG group more frequently had prior GDM ($p=0.005$) and family history of diabetes ($p=0.007$); GTT group women were primigravida more often ($p=0.012$). Conclusions: Pregnant women with GDM diagnosed by abnormal FBG before 24 gestational weeks more likely need insulin to achieve glycemic targets than those diagnosed by classic GTT. This method of diagnosis can be particularly relevant in women with prior GDM or familial history of diabetes.

ADHERENCE TO MEDITERRANEAN DIET IN A SAMPLE OF WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Introduction. Gestational Diabetes Mellitus (GDM) has been associated with many adverse maternal and newborn outcomes (maternal diabetes type II post partum, macrosomia, cesarean delivery). Mediterranean Diet (Med Diet) is a dietary pattern associated to prevention of metabolic syndrome, weight gain, cardiovascular diseases and diabetes mellitus type II. There is a paucity of data on the adherence to Med Diet in pregnancy. The knowledge about dietary habits could be an important start point for dietary and lifestyle interventions to prevent obstetrical complications. The main aim was to investigate, in pregnant women with GDM, adherence to Mediterranean diet by food questionnaire. **Methods.** The study was carried out at the Department of Woman, Mother and Neonate, Buzzi Children`s Hospital, Milan (Italy) and included women with GDM. Anthropometric measurements and Mediterranean Diet Adherence, evaluated by score comprised between 0 and 13 indicated by validate questionnaire, were considered. **Results and Conclusions.** The sample included 32 pregnant women (age: 34.7 ± 5.1 years; gestational age: 27.5 ± 5.5 weeks). The mean pre-pregnant BMI was 26.8 ± 6.5 kg/m²; only the 39% was gaining adequately weight as recommended by IOM (2009). By questionnaire evaluating Adherence to Mediterranean Diet we observed low fish, fruit, beans and nuts consumption, important sources of fiber, healthy fats and healthy proteins that instead could have beneficial effects on glucose metabolism and inflammatory status. Nutritional interventions to control weight gain and to increase adherence to Mediterranean Diet focusing on vegetables, nuts, beans and fish intake should be encouraged in GDM prevention and treatment.

MODE OF DELIVERY IN WOMEN WITH TYPE 1 DIABETES COMPARED TO HEALTHY POPULATION IN SLOVENIA

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INTRODUCTION The incidence of cesarean sections (CS) in Slovenia has risen from 13 % in 2002 to 20,4% in 2015. In the same period, the incidence of CS in pregnancies complicated with type 1 diabetes (DM1) stayed relatively stable (40,7 % to 39%). Recent studies showed that planned CS at term is associated with adverse health outcomes in childhood. Should a vaginal delivery be preferred also in DM1 complicated pregnancy? **METHODS** In retrospective population based study, using the data from National perinatal information system, we compared singleton term deliveries (37 weeks) in women with DM1 with non-diabetic women in the years 2013 to 2015. We compared the need for neonatal resuscitation or intensive care in five groups: 1)spontaneous onset of labour ended with vaginal delivery; 2)induced labour ended with vaginal delivery; 3)spontaneous onset ended with CS; 4)induced labour ended with CS and 5)planned CS. **RESULTS** There were 51576 deliveries in non-diabetic and 100 in women with DM1. In women with DM1 planned CS was more often (19% vs 8,3%) and significantly more vaginal deliveries resulted in CS (23% vs 11,2%). In the group 1 vacuum extractions were more common (18% vs 3,1%) and more neonates needed the minor resuscitation procedures (24% v 5,1% respectively). There were no significant differences in the need for resuscitation in the other groups. **CONCLUSION** Women with DM1 and their newborns are at higher risk for complications at delivery. Vaginal delivery should be preferred in majority of women with DM1.

PREGNANCY COMPLICATED BY HYPERTRIGLYCERIDEMIA AND IMPAIRED GLUCOSE TOLERANCE: A CASE REPORT AND DISCUSSION OF THE LITERATURE

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Background: Hypertriglyceridemia (HTG) in pregnancy can lead to pancreatitis and serious adverse outcomes. Management options include diet modification, nutritional supplements, followed by pharmacotherapy, parenteral heparin, insulin infusion (if hyperglycemic), and plasma exchange. Recommendations for a very low fat (10% of calories) diet for HTG in pregnancy differs compared with non-pregnant patients (high fibre, low trans and saturated fatty acid diet with limited simple carbohydrates) and the evidence for current practices in pregnancy is lacking. Case: We report the interprofessional dietary and pharmacological management in pregnancy of a 35 year old Filipino woman with known impaired glucose tolerance, familial HTG and history of pancreatitis. Despite 3 g daily of omega-3 with a high fibre, low fat, low simple sugar diet; rising triglycerides in the third trimester necessitated adding medium chain triglycerides and gemfibrozil to increase caloric intake and reduce triglycerides, as the patient was losing weight and had increasing triglycerides (17.39 mmol/L). Glucose intolerance was managed with insulin and metformin, keeping her HbA_{1c} under 6%. She delivered a healthy small for gestational age (SGA) child at 37+3 weeks gestation. Conclusion: Management of HTG in pregnancy requires careful attention to diet and selective use of appropriate supplements and fibrates. Updating dietary recommendations for HTG in pregnancy to limit only selected types of fat, as in the non-pregnant population, may help prevent SGA births.

IMPAIRED GLUCOSE TOLERANCE AND GESTATIONAL DIABETES IN TEENAGE PREGNANCIES

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Objective: To identify risk factors and outcomes for impaired glucose tolerance and gestational diabetes in teenage pregnancy in the region of Chania, Crete. Methods: We conducted a retrospective analysis of all teenage pregnancies using a 75 gr oral glucose tolerance test and compared with teenage mothers with normal glucose tolerance testing. Inclusion criteria included nulliparity, maternal age of 19 years or less, and documented oral glucose testing. Exclusion criteria included multiparity, unknown prepregnancy body mass index (BMI), delivery prior to 20 weeks gestation, and maternal age greater than 19 years. Results: During the study period there were 7.155 deliveries, 226 by nulliparous teenage mothers (3.16%) with ages ranging from 14 to 19 years who met inclusion criteria. Of the 226 included teenage deliveries, 15 (6.64%) women were diagnosed with gestational diabetes (n=3) or impaired glucose tolerance (n=12). The majority of 226 subjects (n=162, 71.7%) had a prepregnancy BMI greater than 25 kg/m². All maternal demographic data were similar among the two groups, except teenage mothers with gestational diabetes and impaired glucose tolerance had a significantly higher BMI (34.3±7.8 vs 30.3±6.4) and morbid obesity than controls. On postpregnancy follow up, two of the three (66.6%) teens with gestational diabetes and none of the 12 (0%) teens with impaired glucose tolerance were diagnosed with type 2 diabetes mellitus. Conclusions: Higher prepregnancy body mass index, especially morbid obesity, places the gravid teenage at higher risk for development of gestational diabetes and impaired glucose tolerance in pregnancy.

STRATEGY FOR MANAGING GESTATIONAL DIABETES AFTER GASTRIC BYPASS SURGERY

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Background: Increasing numbers of obese women undergo gastric bypass surgery (GBP) leading to weight loss and subsequently to increased fertility. Resulting pregnancies often occur soon after GBP, which increases the risk of pregnancy complications, specifically gestational diabetes (GDM). Oral glucose tolerance tests are, however, often impossible to perform due to the risk of dumping syndrome whereby developing GDM might be overlooked. The aim of this study was to profile GBP operated women in pregnancy regarding their glucose values, select pregnant women with hyperglycemia according to defined criteria, and study the outcome of these pregnancies. Methods: All GBP operated pregnant women during 2012-14 in our region in southern Sweden (n=84) were included and underwent 3-day 7-point glucose profiling daily in gestational week 12 and 28, and agreed to be included in our GDM programme if necessary. Results: Eleven (13%) women presented with 2 or more glucose levels above 8 mmol/L in the profiling and were considered and managed as GDM. Mean HbA1c week 28 was 32 ± 5 mmol/mol and mean p-glucose 6 mmol/L. Five of these eleven women (45%) continued to display hyperglycemia in follow-up and received insulin. There was no significant difference between GBP operated women regarded as having GDM, and those without, either in age, ethnicity, family history of diabetes or duration since GBP surgery. Neither did groups differ significantly regarding maternal or fetal outcome which will be presented in detailed data. Conclusion: The proposed strategy to define GDM needing treatment despite GBP seems to fulfil its purpose.

BIRTHWEIGHT AND PLACENTAL WEIGHT ARE MUCH HIGHER IN PREGNANCIES WITH DIABETES TYPE-1 COMPARED TO PREGNANCIES WITH GESTATIONAL DIABETES.

A POPULATION-BASED STUDY OF 183,646 PREGNANCIES.

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Objectives. We studied whether birthweight and placental weight differ in pregnancies with different types of diabetes, using pregnancies without diabetes as the reference. Method. We performed a population study of 183,646 singleton pregnancies by using data from the years 2009-2014 in the Medical Birth Registry of Norway. By applying linear regression analysis, we estimated differences in birthweight and placental weight (in grams) between pregnancies with diabetes type-1 (DM1)(n=790), pregnancies with diabetes type-2 (DM2)(n=424) and pregnancies with gestational diabetes (GDM)(n=4891). We used pregnancies without diabetes (n=177,541) as reference, and we made adjustment for maternal body mass index (BMI) and gestational age at birth. Results. Mean birthweight in pregnancies without diabetes was 3528.9 g. Adjusted mean birthweight was 522.0 g ($p<0.001$) higher in pregnancies with DM1 than in pregnancies without diabetes, and birthweight was 224.6 g and 130.1 g higher in pregnancies with DM2 and GDM, respectively. Mean placental weight in pregnancies without diabetes was 670.2 g. Placental weight was 109.4 g ($p<0.001$) higher in pregnancies with DM1 than in pregnancies without diabetes. Also in pregnancies with DM2 and

GDM, placental weight was higher than in pregnancies without diabetes (54.7 g and 35.7 g, respectively). Conclusion. Birthweight and placental weight were highest in pregnancies with DM1. This was a surprising finding since specialized antenatal care for women in Norway with DM1 is accessible to all and free of charge. Our findings such encourage further research to understand the different growth patterns according to type of diabetes.

ANTENATAL TREATMENT OF GESTATIONAL DIABETES AND OFFSPRING'S FUTURE CARDIOMETABOLIC RISK

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Objective: To investigate whether antenatal treatment to gestational diabetes will reduce offspring's future cardiometabolic risk Methodology: Mothers who had joined the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study in the Hong Kong Center were re-evaluated together with their child born during the study period, at 7 years post-delivery. A subgroup of 123 subjects from the HAPO study were matched with another 123 mothers who were diagnosed with gestational diabetes (according to the previous ADIP criteria) and received antenatal treatment at the same period time for the 2-hour glucose levels at OGTT. All children underwent an OGTT after 8 hour of fasting with 5-point plasma glucose and insulin levels. Results: Offspring of mothers who were untreated for GDM had a significantly higher fasting C-peptide (0.32 ± 0.41 vs 0.20 ± 0.25 , $p=0.01$) than offspring of mothers were treated for GDM. There is a trend that the post challenge glucose levels were higher among the offspring of mothers who were untreated for GDM, but does not reach statistical significance. There is no difference in insulin resistance, beta cell function, oral disposition index and the rate of childhood obesity, hypertension, prediabetes and diabetes between the 2 groups. Conclusion: Consistent with the long term follow up of ACHOIS and MFMU trials, we cannot demonstrate any reduction in childhood cardiometabolic risk with antenatal treatment of GDM below the level of overt diabetes.

THREE YEARS EXPERIENCE WITH CGM/FGM IN PREGNANT WOMEN WITH TYPE 1 DIABETES

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Background: For all women with Type 1 diabetes (T1D) pregnancy carries an increased for malformations, accelerated growth of the fetus, preeclampsia, premature delivery, sectio and neonatal intensive care. A tight blood glucose control is vital to reduce complications during pregnancy and delivery. Patients and methods: All pregnant women with T1D at our hospital are offered a CGM/FGM system during pregnancy. Since 2014 we have had 46 women who have completed the pregnancy wearing a CGM/FGM. Freestyle Libre (Abbot) is most used but in case of non-awareness of hypoglycaemia, systems with alarm, as Dexcom or Guardian (Medtronic) is preferred. Glucose values were regularly transferred via Diasend to the diabetologist. Insulin doses were adjusted by

weekly phone calls to the patients. Levels between 4-8 mmol/L were target for glucose values. Results: All women had an increase of median insulin dose from 43 to 84.5 E/day. Weight increased from 71.9 to 86.6 kg. HbA1c decreased from 56.8 to 44.1 mmol/mol. Mean glucose was 7.5±0.9 mmol/L, 51.8 % of time was spent in glucose target, 11.7% was below 4 mmol/L and 36.7% was above 8 mmol/L. Mean gestational length was 38 weeks, frequency of preeclampsia 8.7% and sectio frequency 38%. Birth weight was 3804 g and frequency of neonatal hypoglycaemia was 13%. Conclusion: It is possible to achieve almost normoglycemia in pregnant women with T1D by use of new technology. The CGM/FGM system is necessary to ensure a safe pregnancy without severe hypoglycaemia.

EXPRESSION AND ACTIVITY OF FOXO1/FOXO3A TRANSCRIPTION FACTORS AND ENOS IN HUMAN MICROVASCULAR ENDOTHELIAL CELLS

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The placenta is a highly vascularized organ that mediates the complex functional interaction between mother and fetus, being the endothelium, the main tissue involved in this interaction. Dysregulation of the endothelial function leads to pregnancy disorders such as gestational diabetes mellitus (GDM). It has been described that, human placental microvascular endothelial cells (hPMECs) from pregnancies with GDM have high basal levels of nitric oxide (NO) and respond to insulin decreasing this synthesis to levels observed in untreated non-pathological cells. In contrast, in cells from normal pregnancies insulin increases NO synthesis. NO is synthesized by endothelial nitric oxide synthase (eNOS), whose expression is regulated by the transcription factors FoxO1/FoxO3a, among others. However, the role of insulin in this pathway is unknown. We propose that FoxO1/FoxO3a control the expression of eNOS in insulin response in these cells through of differential regulation of their receptors, Insulin Receptor IR-A and IR-B. We used cell line of skin microvasculature (HMEC1) in conjunction with hPMEC of healthy and DMG placentas. In HMEC1 (exposed to high or normal glucose levels) and hPMEC (from normal and DMG pregnancies), treated and untreated with insulin, analyzed the expression of FoxO1/FoxO3a by qPCR, and nuclear/cytoplasmic localization by western blotting and immunofluorescence. Also, we evaluated eNOS expression in HMEC1 by these same methods. And we analyze intracellular NO levels by a fluorimetric assay. Preliminary results suggests that FoxO1 cytoplasmic levels decrease in microvascular endothelial cells after insulin treatment. This could be related with FoxO1/FoxO3a nuclear activity increase and therefore eNOS transcription reduction.

HYPOGLYCEMIA : AN IMPORTANT DETERMINANT OF MATERNAL DIABETES AND UNWANTED PREGNANCY OUTCOMES DESPITE TIGHT GLYCEMIC CONTROL.

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Recurrent hypoglycemia becomes inevitable while following tight glycemic targets which lead to maternal weightgain, macrosomia and low birth weight offsprings. Records of 100 pregnancy with diabetes including 25 GDM using insulin has been explored for hypoglycemia with glucometer, 21 never experienced hypoglycemia throughout pregnancy including 10 GDM. 13 delivered normal weight offsprings including all 10 GDM. 8 with preexisting diabetes gave birth to macrosomia. It has

been observed that more incidences of hypoglycemia not only led to higher maternal weight gain but also resulted in more number of macrosomia and low birth weight offsprings. None of the GDM who never experienced hypoglycemia developed type 2 DM after pregnancy was over. On the other hand 40% of those who experienced hypoglycemia developed type 2 DM after pregnancy with 60:40 ratio of macrosomia : low birth weight offsprings. Among pre pregnancy diabetic mothers, about 14.6% never experienced hypoglycemia during pregnancy despite taking insulin but only 20% of them delivered normal birth baby. Out of remaining 85.3% who experienced hypoglycemia 17.18 aborted, 18.75 delivered low birth weight, and 43.75% developed macrosomia. 20.3% delivered normal birth baby despite recurrent hypoglycemia.

Hypoglycemia contributes not only in maternal weight gain but also in maternal diabetes following GDM despite targeting tight glycemic control. Apart from that it seems an important determinant for bad outcome of pregnancy in pre diabetic mothers.

IN EARLY PREGNANCY HOME BLOOD PRESSURE IS MORE THAN FIVE MMHG LOWER THAN ROUTINELY MEASURED OFFICE BLOOD PRESSURE IN WOMEN WITH PREEXISTING DIABETES AND IN HEALTHY WOMEN

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Aim: To determine the association between home- blood pressure (BP) and office-BP in early pregnancy in women with preexisting diabetes in comparison with healthy women.

Methods: Ninety-nine women with diabetes (64 with type 1 and 35 with type 2) and 65 healthy women measured home-BP for three days with three measurements both in the morning and in the evening with an automatic device (Microlife BP 3A Plus) at median 71 days and 90 days of pregnancy, respectively. Home-BP was similar on the first and the following days of measurement in women with diabetes and in healthy women ($p=0.53$ and $p=0.94$), and therefore a mean of all 18 measurements was used. Office-BP was measured once after five minutes resting, and if values were above 140/90 mmHg further measurements were done. **Results:** In women with diabetes home-BP and office-BP were $111 \pm 9/69 \pm 7$ and $119 \pm 12/76 \pm 8$ mmHg, mean (\pm SD), respectively. The values for healthy pregnant women were $101 \pm 5/63 \pm 5$ and $109 \pm 12/73 \pm 7$ mmHg with upper normal limits for home-BP of 111/74 mmHg (mean + 2 SD). The white-coat effect was 8/7 mmHg and 8/10 mmHg, respectively. Both home-BP and office-BP were higher among women with diabetes compared with healthy pregnant women (all $p<0.01$). Four (4%) women with diabetes were on antihypertensive therapy.

Conclusion: In early pregnancy both women with diabetes and healthy women have a white-coat effect exceeding five mmHg. The upper normal limit of home-BP was 111/74 mmHg.

THE EFFECT OF REGULAR EXERCISE COMMENCED IN EARLY PREGNANCY ON THE INCIDENCE OF GESTATIONAL DIABETES MELLITUS IN OVERWEIGHT AND OBESE PREGNANT WOMEN : A RANDOMIZED CONTROLLED TRIAL

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Background: The aim of our study was to evaluate whether regular moderate exercise commenced in early pregnancy could decrease the incidence of GDM in overweight and obese women. **Methods:** We conducted a randomized controlled trial at Peking University First Hospital. Singleton non-smoking pregnant women who were ≥ 18 years old, with a prepregnancy body mass index (p-BMI) ≥ 24 kg/m² before 12⁺⁶ gestational weeks were recruited and randomly allocated to either an exercise intervention group (EG) or control group (CG). The primary outcome was incidence of GDM. This trial was registered at www.clinicaltrials.gov, identifier: NCT02304718. **Results:** From December 2014 to April 2016, 300 women with a mean p-BMI of 26.78 ± 2.75 kg/m² were recruited. We randomly assigned 150 women to each group. 132 out of 150 women in EG and 133 out of 150 in CG underwent 75g OGTT. The incidence of GDM was 22.0% (29/132) in EG, while 40.6% (54/133) in CG (odds ratio =0.41, 95%CI, 0.24-0.71). EG had lower blood glucose levels at 0h, 1h and 2h in OGTT compared to CG levels (4.76 ± 0.41 vs. 4.96 ± 0.51 mmol/L, $p=0.001$; 7.99 ± 1.67 vs. 8.57 ± 1.86 mmol/L, $p=0.009$; 6.57 ± 1.18 vs. 7.03 ± 1.62 mmol/L, $p=0.009$; respectively). There were statistical significances in secondary outcomes between EG and CG, such as elevated physical activity levels (1741 ± 798 vs. 1327 ± 1300 Met-min/week, $p=0.010$), reduced gestational weight gain (4.08 ± 3.02 vs. 5.92 ± 2.58 kg, $p0.001$) and insulin resistance levels (2.92 ± 1.27 vs. 3.38 ± 2.00 , $p=0.033$). **Conclusions:** Regular moderate exercise commenced early in pregnancy can decrease the incidence of GDM in overweight and obese Chinese pregnant women.

EFFICACY, SAFETY AND MECHANISM OF CHINESE HERBAL MEDICINES FOR GESTATIONAL DIABETES MELLITUS: EVIDENCE FROM META-ANALYSIS, ANIMAL AND CELLULAR STUDIES

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Background: Although good glycaemic control by dietary modifications, oral hypoglycaemic drugs, and even insulin therapy may reduce complications of gestational diabetes mellitus (GDM), pregnancy outcomes are still not optimal. Chinese herbal medicines (CHM) have been used for thousands of years to treat diabetes in China and most other Asian countries. Many clinical trials have been carried out, but its efficacy, safety and mechanism on GDM are still not clear. **objective:** To provide evidence of efficacy, safety and mechanism of CHM for GDM. **Methods:** Meta-analysis of clinical trials to evaluate efficacy and safety of CHM for GDM. Animal, cellular and microarray studies to investigate its therapeutic effects and actions on GDM models. **Results:** Sufficient qualified clinical trials and participants were included and showed either CHM alone or CHM in combination with other therapies was more effective than other therapies alone to control hyperglycaemic controls and improve pregnancy outcomes. Amongst all CHM, Dwarf Lilyturf Tuber (*Ophiopogonis Radix*, Maidong) was the most effective CHM to improve glucose intolerance in Lepr^{db/+} diabetic pregnant mice in dose-dependent manner. Fetal resorption, congenital malformation and macrosomia were also reduced. Furthermore polysaccharide extract of Maidong enhanced insulin secretion in Lepr^{db/+} diabetic, high

fat diet-induced diabetic mice and MIN6 insulinoma cells by inhibiting NFkB/IL1b inflammatory pathway. Conclusion: This is the first comprehensive studies to provide strong evidence of efficacy, safety and mechanism of CHM for GDM. It will form a national practice guideline of CHM for GDM in the regions. Further studies are needed before promoting to the world.

ULTRASONOGRAPHIC PARAMETERS AND IT'S RELEVANCE IN TREATMENT CONTROL OF PREGNANT PATIENTS WITH GESTATIONAL DIABETES

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Objective: German guidelines for the treatment of gestational diabetes (GDM) instruct physicians to involve fetal growth-parameters into the treatment of GDM, leading to higher blood-glucose targets if the fetus` abdominal circumference (AC) grows below the 10th and to lower targets if the fetus grows above the 75th percentile. The thickness of the fetal fat layer (FFL) has been claimed to be another even more sensitive and non-invasive marker reflecting the nutritional state of the fetus. The aim of this study was to evaluate the association of AC, FFL and estimated fetal weight (EFW) to course and outcome of patients with GDM. **Methods:** Data on fetal growth and neonatal outcome were collected prospectively in 466 patients being treated for GDM in 2012-2014 at our outpatient department. **Results:** AC, EFW and FFL increased linear with gestational age. FFL raised linear between 24 and 40wog from 2.3mm to 4.2mm in our cohort. Insulin therapy started at an average of 28.7wog. At 30wog and 34wog FFL-values were significantly discriminating pregnancies requiring insulin therapy from those on dietary control. AC differed significantly at 28wog and 36wog. No significant differences concerning EFW were found at any week of gestation. **Conclusions:** Our results implicate that measurement of the FFL in combination with the AC is a useful parameter to monitor treatment in patients with GDM and furthermore reveals first evidence that FFL between 30 and 32wog. might discriminate patients who need insulin from those who don`t. We did not find EFW to be associated to therapeutic needs.

CIRCADIAN MISALIGNMENT AND THE INFLUENCE ON INSULIN RESISTANCE IN GDM PATIENTS

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Objective: Increasing evidence supports a role for the circadian rhythm in the development of metabolic disease. In pregnant women with gestational diabetes (GDM) an increasing number presents with isolated nocturnal insulin resistance requiring therapy with long acting insulin, partly even without the need of short acting insulin. Here we attempt to relate data on circadian rhythm to the insulin therapy during pregnancy. **Methods:** Surveys assessing data on life style, sleep habits, family status, employment status and profession were mailed to 466 patients with GDM seen in our outpatient department between 20012 und 2014. **Results:** 2012 10.2%, 2013 18.7% and 2014 33.3% of 466 patients with GDM were treated with long acting insulin only. Until date 121 women replied to the survey (26%). 57 (47,1%) were treated with insulin, 64 (52,9%) with diet only. Patients receiving insulin therapy were more likely to live with children (insulin 56,1% vs. diet 43,9% p=0,02), there was no difference regarding all other life style parameters compared to dietary treated patients. Women receiving long acting insulin only tend to be more often in jobs requiring night shifts (30,8% vs. 9,8%, p=0,08). **Conclusions:** Environmental factors affecting the circadian rhythm, including nightwork, shift

work and children, influence insulin resistance in GDM patients. These should be considered as risk factors for impaired glucose control and the measurement of fasting glucose might be a mandatory extension of GDM screening if the evaluated risk factors are present.

ASSOCIATION OF FETAL MACROSOMIA IN PATIENTS WITH GESTATIONAL DIABETES – WHAT MATTERS MOST GLUCOSE CONTROL, MATERNAL BMI OR WEIGHT GAIN DURING PREGNANCY?

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Background: Recent studies suggest that gestational weight gain (GWG) and pregravid BMI are the most relevant factors for fetal macrosomia (LGA), exceeding the impact of diabetes during pregnancy. Does pregestational BMI and GWG constitute a more robust association to LGA than gestational diabetes (GDM)? Methods: We compared 466 GDM patients treated in our department in 2012-2014 with 3672 woman from our perinatal birth cohort without diabetes diagnosis, concerning LGA, pregestational BMI, diabetes and GWG. Adjusted ORs were determined using multivariate logistic regression. Maternal age, weeks of gestation, parity and gender of the newborn were included as covariates. Results: LGA (90th centile) did not differ in both groups. Pregravid BMI was categorized in underweight (5.1%), normal (65.0%), overweight (18.8%) and obese (11.1%), accordingly 30% were overweight or obese in our cohort. BMI categories differed significantly between GDM and non-GDM (p<0.01). GWG was grouped using IOM-criteria (recommended/excessive GWG) and showed no difference between the groups - 45% showed excessive GWG in each group. Multivariate analysis showed a significant influence of BMI (OR 1.039, CI 1.007-1.071), GWG (OR 1.064 CI 1.028-1.102) and IOM-criteria on LGA: recommended GWG decreased the risk for a LGA (OR 0.588 CI 0.390-0.888) while excessive GWG raised the risk (OR 1.7 CI 1.126-2.567). Diabetes alone seems to have no significant influence (OR 0.88 CI 0.579-1.338). Conclusions: Our data verify the impact of GWG and maternal BMI on fetal macrosomia and strongly support IOM- recommendations of GWG. Controlled GDM doesn't influence fetal macrosomia.

ASSOCIATION OF GENETIC VARIANTS IN THE PROMOTER AND START CODON OF PPAR γ 2 WITH GESTATIONAL DIABETES MELLITUS IN CHINESE POPULATION.

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Background: Peroxisome proliferator-activated receptor γ 2 (PPAR γ 2) is a nuclear hormone receptor of ligand-dependent transcription factor with a key role in adipogenesis and insulin sensitization in the pathogenesis of diabetes mellitus. Previous reports identified association of PPAR γ 2 polymorphisms with gestational diabetes mellitus (GDM), while our meta-analysis confirmed the association was significant only in Asian population, but not in Caucasians population. We hypothesised that genetic variants in PPAR γ 2 promoter and start codon are linked and associated with susceptibility of GDM and determine insulin sensitivity during pregnancy. Objective: To detect genetic variants by target sequencing in promoter and start codon of PPAR γ 2 and determine its linkage disequilibrium and association with GDM in Chinese population. Methods: PPAR γ 2 promoter and start codon (-2091 to +82 bp) of 400 GDM and 400 gestational-age matched control samples from Guangzhou cohort were sequenced. Haploview estimated the linkage disequilibrium of the identified SNPs. Results: We identified 15 variants. 7 common variants were not significantly associated with GDM (OR 0.710-1.208, 95% CIs 0.445-0.877 to 1.132-1.664, P<0.05) but showed significant linkage disequilibrium

($D^{\circ}0.7$, $R^20.9$). However T-A-A-T-G haplotype were not significantly associated with GDM ($\chi^2=2.461$, $P=0.117$). 5 rare variants were found in either control or/and GDM, but 3 novel variants - 807 A/C, -1769 A/T and -1789 A/C were found only in GDM. Conclusion: Most of the genetic polymorphisms in promoter and start codon of PPAR γ 2 gene were not significantly associated with the risk of GDM in southern Chinese population. Novel SNPs in GDM were newly discovered further molecular and functional characterisation is needed.

GLYCATED ALBUMIN MAY PREDICT GLUCOSE INTOLERANCE AFTER DELIVERY IN PATIENTS WITH GESTATIONAL DIABETES DIAGNOSED ACCORDING TO THE IADPSG CRITERIA

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To assess the clinical risk factors of glucose intolerance after delivery in patients with gestational diabetes (GDM). A total of 148 patients with GDM were included in this study. Of these, 30 patients were diagnosed with GDM before 20 weeks of gestation (B20w group) and 118 patients were diagnosed with GDM after 20 weeks of gestation (A20w group). An oral glucose tolerance test (OGTT) was performed on all subjects 58.0 \pm 13.3 days after delivery. In each group, the association between the OGTT results after delivery and the following factors were analyzed: maternal age, pre-gestational BMI, family history of diabetes, plasma glucose levels on diagnostic OGTT for GDM, number of abnormal OGTT values, HbA1c and glycated albumin (GA) levels at the time of GDM diagnosis, serum C-peptide levels, lipid metabolism, insulin therapy during pregnancy, and pregnancy outcomes.

Results OGTT after delivery revealed glucose intolerance in 9 (30%) patients in the B20w group and 35 (30%) in the A20w group. In the A20w group, patients with glucose intolerance had higher rates of family history of diabetes and of insulin injection therapy, higher 2-h glucose levels on OGTT, and higher GA levels than had patients with normal glucose tolerance. Logistic regression analysis showed that the GA level was an independent predictor for glucose intolerance in the A20w group. In the B20w group, no independent predictors were found.

Conclusions These results suggest that high GA levels may be associated with glucose intolerance after delivery in patients with GDM diagnosed after 20 weeks of gestation.

DIABETES MELLITUS IN PREGNANCY ACTIVATES THE INNATE IMMUNE RESPONSE ON NEONATAL MONOCYTE.

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Diabetes mellitus (DM) in pregnancy causes congenital malformation, macrosomia, respiratory distress syndrome, and other abnormalities in neonates. It has been proposed hypothesis that DM is caused by activated innate immunity, but whether maternal DM affects the neonatal innate immune system is unknown. We aimed to reveal the influence of DM in pregnancy on the toll-like receptor (TLR)-mediated innate immune response in neonates. Cord blood was collected after full-term vaginal or cesarean delivery and classified into a DM group (n=8) and non-DM (control) group (n=7). Mononuclear cells were harvested from cord blood by using density gradient centrifugation, after

which anti-CD14 magnetic beads were used to isolate monocytes from the mononuclear population. After monocytes were cultured with lipopolysaccharide (TLR4 ligand), flagellin (TLR5 ligand), Pam3CSK4 (TLR1/TLR2 ligand), zymosan (TLR2/TLR6 ligand), or macrophage-activating lipopeptide (TLR2/TLR6 ligand) for 12 h, the cytokine levels in the culture supernatants were measured. Maternal BMI was higher in the DM group than control group ($P=0.01$). Other maternal and neonatal characteristics did not have any difference in two groups. Compared with the control group, the DM group had higher concentrations of IL-8 ($P=0.01$) and tumor necrosis factor alpha ($P=0.02$) after monocyte cultures were stimulated with Pam3CSK4 and higher concentrations of IL-8 ($P=0.01$) after flagellin treatment. DM in pregnancy induces excessive inflammatory activation in neonates via a TLR5- or TLR1/2-mediated innate immune response. We have a hypothesis that this mechanism associates “Metabolic Memory”.

EXPRESSION OF TOLL-LIKE RECEPTOR 4 PATHWAY COMPONENTS IN THE PLACENTA, RECTUS ABDOMINIS MUSCLE, OMENTUM AND SUBCUTANEOUS ADIPOSE TISSUE OF PATIENTS WITH GESTATIONAL DIABETES MELLITUS

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OBJECTIVE: The toll-like receptor 4 (TLR4) signaling pathway is involved in insulin resistance and the development of metabolic syndrome. To investigate the relationship between the TLR4 pathway and the development of gestational diabetes mellitus (GDM), the expression of TLR4 pathway mediators in the rectus abdominis muscle, omentum, subcutaneous adipose tissue and both surfaces of placenta of GDM patients and normal pregnant women was examined in this study. **RESEARCH DESIGN AND METHODS:** Expression of TLR4, nuclear factor- κ B (NF- κ B) and interleukin-1 β (IL-1 β) were measured in different tissues of healthy pregnant women ($n=28$) and GDM patients ($n=22$) using real-time RT-PCR and immunohistochemical staining. The difference of TLR4 pathway components expression was further studied in both surfaces of placenta of healthy pregnant women ($n=61$) and GDM patients ($n=61$) using real-time RT-PCR. **RESULTS:** Immunohistochemical staining and quantitative RT-PCR demonstrated that the protein and mRNA levels of TLR4, NF- κ B and IL-1 β were significantly higher in tissues from the GDM group ($P<0.05$). The expression of TLR4 and downstream cytokines in the basal plate of the placenta was significantly higher in the GDM group ($P<0.05$). The expression of TLR4 was correlated with the OGTT and HbA1c values ($P<0.05$) and fetal weight ($P<0.01$). **CONCLUSION:** The expression of TLR4 and downstream cytokines was significantly higher in different tissues of GDM group and in the basal plate of the placenta, indicating a role for the innate immune system in fetal protection and GDM pathogenesis.

PREGNANCY OUTCOMES WITH DEFERRED INDUCTION OF LABOUR AMONG WOMEN WITH WELL CONTROLLED GESTATIONAL DIABETES IN A SINGLE CENTRE IN THE NETHERLANDS.

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Background We conducted a retrospective cohort study aimed at describing pregnancy outcomes in term gestational diabetes mellitus (GDM) in the Amsterdam Medical Centre. The maternal and neonatal outcome of term and post term pregnancies was described. **Methods** A retrospective cohort of women with GDM was selected from our electronic patient data system. Women were included if they had GDM, were not using insulin, had singleton pregnancy, and term or post-term (37wks-42wks) delivery. Women were treated according to national GDM protocols, compliant with WHO requirements. Management included monitoring maternal glycemia. Labour wasn't routinely induced

in women with dietary well-controlled GDM. Data was collected on GDM management, mode of delivery and perinatal outcomes (shoulder dystocia, hyperbilirubinemia, neonatal hypoglycemia, macrosomia and Apgar score). Results From January 2010 till December 2015 we included 159 women with GDM on dietary therapy. The rate of secondary caesareans was 19.2% before 39 weeks compared to 26,6% after 41 weeks gestation. Compared to 3,8% before 39 weeks, shoulderdystocia complicated 14,3% after 41 weeks gestation. Neither finding reached statistical significance. The incidence of macrosomia was lowest in the 39th week, OR 0,19 (0,04-0,86) compared to babies born before or after the 39th week of pregnancy. Conclusions Although statistically not robust, our findings highlight the need for larger randomized trials to address the question of necessity and timing of labour induction in mild GDM.

SCREENING FOR MACROSOMIA IN GESTATIONAL DIABETES: A METANALYSIS OF DIAGNOSTIC TEST ACCURACY

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Aim: Gestational diabetes (GDM) is common and is associated with neonatal complications such as macrosomia (birthweight 4kg). There is an urgent need to identify infants at risk of macrosomia earlier in pregnancy to allow for appropriate intervention. The aim of this study was to perform a metanalysis of diagnostic accuracy for the use of fetal abdominal circumference (AC) on ultrasound to predict infants at risk of macrosomia. **Method:** We performed a literature search on EMBase, CINAHL & PubMed with inclusion criteria: 'singleton pregnancies, 20-32 weeks' gestation', keywords: abdominal circumference (AC), large for gestational age (LGA), macrosomia, birthweight, gestational diabetes mellitus (GDM), pregnancy. A metanalysis of diagnostic accuracy was performed and a hierarchical summary receiver-operator curve (HSROC), which shows how average sensitivity relates to average specificity, was constructed. The area under the curve (AUC) was reported to measure the trade-off between sensitivity and specificity for using AC as a screening test.

Results: Literature search yielded 3 papers, 6 sub-populations (n=3813) from France, Ireland and Netherlands, including 5 GDM (n=364) populations and 1 healthy population (n=3449) that assessed AC as a screening test. The HSROC yielded an AUC 0.75±0.125. Overall sensitivity was 0.61 (95%CI 0.47-0.73) and specificity was 0.79 (0.69-0.86). **Conclusion:** Our metanalysis of diagnostic accuracy revealed that AC was a reasonable predictor of macrosomia overall although the sensitivity was low and confidence intervals were wide due to the small number of eligible studies. Specificity was reasonable suggesting that AC could be used to exclude infants at low risk of macrosomia.

GESTATIONAL DIABETES: CAN AN EARLY ULTRASOUND MEASUREMENT OF FETAL ABDOMINAL CIRCUMFERENCE BE USED TO IDENTIFY THOSE AT RISK OF MACROSOMIA AND LARGE-FOR-GESTATIONAL-AGE AT TERM? A META-ANALYSIS.

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Gestational diabetes can affect up to 5% of pregnancies. Infants exposed to maternal hyperglycaemia are at higher risk of accelerated growth *in utero*, causing macrosomia (birth weight >4kg). Prediction of birth weight depends on unreliable measures such as clinical palpation and uterine fundal height. We performed a meta-analysis to investigate the use of fetal abdominal circumference in ultrasound as a predictive tool for earlier identification of infants at risk of macrosomia.

Using PubMed, CINAHL and EMBASE, a literature search was performed with inclusion criteria: 'singleton pregnancies, 20-32 weeks' gestation', key terms: fetal abdominal circumference (AC), large-for-gestational-age (LGA), macrosomia, birth weight, gestational diabetes mellitus (GDM), pregnancies, and normal pregnancies. A meta-analysis was performed using a fixed effects model with outcome measured as the odds ratio (OR). Heterogeneity was assessed with the I^2 statistic. 7 subgroups (n = 7173) were identified, predicting LGA, macrosomia and birth weight in normal and GDM populations. Data showed that AC is a predictor of these outcomes with an OR of 2.02 [1.753-2.327], p = 0.000. An increased effect was seen earlier in pregnancy (20-22 weeks; OR 2.983 [2.313-3.848]) compared to 28-32 weeks (OR 1.695[1.427-2.014]). There was no significant difference between GDM and normal populations. Heterogeneity was increased in normal populations compared with GDM. ($I^2 = 75.624\%$, p=0.003 vs 0.000%, p=0.541). AC can predict LGA, macrosomia and birth weight between 20-32 weeks. It may be useful in predicting LGA earlier in pregnancy, but the difference between outcomes between populations (normal vs GDM) is not clear.

DECIDE STUDY: CHANGING DIAGNOSTIC CRITERIA AMONG 3678 WOMEN SCREENED FOR GESTATIONAL DIABETES MELLITUS: IMPACT ON PREVALENCE AND PERINATAL OUTCOME

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Introduction: The impact on prevalence and perinatal outcomes of the introduction of new diagnostic thresholds for gestational diabetes mellitus (GDM) by the IADPSG (2010), compared with previous WHO 1999 criteria, is not well established. **Methods:** 3678 pregnant women with a risk factor for GDM underwent a 75-g OGTT between January 2011 to October 2016 in a single centre in the Netherlands. We compared GDM prevalence, maternal characteristics and pregnancy outcomes between four diagnostic groups 1:no GDM according to both criteria(-/-); 2:GDM according to WHO but not to IADPSG criteria(+/-); 3:GDM according to IADPSG but not to WHO criteria(-/+); 4:GDM according to both criteria(++). **Results:** When applying IADPSG criteria, GDM prevalence increased from 22.8% to 36.3%, with discordant results between criteria(+/- and -/+) in 22.1% of women. Compared to women in the non-GDM(-/-) group, patients in group 3, i.e. diagnosed by IADPSG criteria only(-/+), were older, had a higher BMI, were more likely to develop hypertension (18.8% vs 14.2%; P=0.005), showed more fetal macrosomia (21.6% vs 16.0%; P=0.001), more often large-for-gestational-age birth weight (15.9% vs 10.3%; P=0.001) and more often low 5-minute Apgar scores (3.8% vs 1.9%; P=0.011). No differences were observed for preterm birth, secondary caesarean and assisted vaginal delivery rates. **Conclusion:**

In this Dutch population, applying the IADPSG criteria identified a group at higher risk of adverse outcome, but also resulted in a dramatic increase in GDM prevalence. Whether standard GDM treatment is able to amend this increased perinatal risk remains to be established.

Fetal Cardiology

DECIDE STUDY: CHANGING DIAGNOSTIC CRITERIA AMONG 3678 WOMEN SCREENED FOR GESTATIONAL DIABETES MELLITUS: IMPACT ON PREVALENCE AND PERINATAL OUTCOME

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In this Dutch population, applying the IADPSG criteria identified a group at higher risk of adverse outcome, but also resulted in a dramatic increase in GDM prevalence. Whether standard GDM treatment is able to amend this increased perinatal risk remains to be established.

BIVENTRICULAR IMPACT OF PRENATAL PULMONARY VALVE STENOSIS

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Objectives: To define the pattern of fetal echocardiographic changes associated with isolated pulmonary valve stenosis (PS) and its correlation with postnatal pulmonary valvuloplasty. **Methods:** A prospective cohort study including 16 fetuses with isolated PS and 48 controls. Fetal comprehensive echocardiography were performed in all cases at diagnosis and followed-up until 12 months of life for the need of postnatal pulmonary valvuloplasty. **Results:** Median gestational age at PS diagnosis was 33.4 weeks (range 20.0-36.5), most cases corresponded to mild and moderate PS and 37.5% required postnatal valvuloplasty. Fetuses with PS presented with a larger, hypertrophic and more globular hearts together with increased cardiac output and right ventricular (RV) diastolic dysfunction (increased ductus venosus pulsatility index and E/E' ratio (7.5±3.1 vs 5.7±1.8, p0.02)). Additionally, fetuses with PS displayed a compensatory increase in left ventricular (LV) motion (increased ejection fraction (79.3% ± 8.2 vs. 67.6% ± 11.3, p0.003) and mitral annular-plane systolic excursion (5.94 ± 1.38

mm vs. 5.0 ± 1.22 mm, $p0.03$). Finally, fetuses requiring a postnatal valvuloplasty showed significantly smaller RV and pulmonary valve diameter, reduced tricuspid annular-plane systolic excursion (5.08 ± 1.59 mm vs. 8.07 ± 1.93 mm, $p 0.02$), increased LV cardiac output and more pronounced LV diastolic dysfunction (mitral E' velocity, 7.78 ± 0.90 cm/s vs. 8.16 ± 1.58 cm/s, $p0.008$). Conclusions: Fetuses with PS presented with larger, globular and hypertrophic hearts with impaired relaxation and increased LV motility in the third-trimester of pregnancy. Our data suggest that RV and LV functional parameters could be useful for predicting the need for postnatal pulmonary valvuloplasty.

FETAL CARDIAC REMODELLING AND MITOCHONDRIAL TOXICITY IN HIV-INFECTED PREGNANCIES

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Background: HIV-exposed but uninfected (HEU) children are generally considered healthy, although several studies have reported differences in cardiac structure and function. The underlying mechanism of these cardiac changes remains to be elucidated, but mitochondrial toxicity from combined antiretroviral therapy (cART) during fetal life is suggested as a pathogenic pathway. Our aim was to evaluate fetal cardiac function and mitochondrial toxicity in HIV pregnancies. Methods: Prospective cohort study including 31 non-infected fetuses from HIV pregnant women on cART and 30 fetuses from non HIV-infected women. Fetal echocardiography was performed at 26-32 weeks of pregnancy. Neonatal cord blood mononuclear cells were collected at delivery to study mitochondrial parameters including mitochondrial DNA content (ND2/18SrRNA) by rtPCR and mitochondrial function (enzymatic activities) normalized by the number of mitochondria (CS), by spectrophotometry. Results: Fetuses from HIV pregnant women on cART presented larger hearts (cardiothoracic ratio: HIV-exposed mean 0.30 (SD 0.04) vs. controls 0.27 (0.03)) and mild pericardial effusion together with signs of diastolic dysfunction (isovolumic relaxation time: 51 ms (12) vs. controls 43 ms (7.7); $p=0.003$). Despite preserved mtDNA content, HEU newborns showed reduced mitochondrial complex IV activity (COX/CS HIV 0.44 (0.27) vs. controls 0.61 (SD 0.36); $p 0.049$) as a result of a compensatory increase in the number of mitochondria in order to maintain the global mitochondrial activity in HIV pregnancies. Conclusions: Uninfected fetuses from HIV-infected mothers on cART present cardiac remodelling and mitochondrial dysfunction at birth. Future studies are warranted to evaluate the isolated contribution of the virus and the toxicity of different cART combinations on the fetal heart.

FETAL ATRIAL SEPTAL ANEURYSM: POSTNATAL OUTCOME IN A SERIES OF 29 CASES.

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Background/hypothesis Atrial Septal Aneurysm (ASA) has been associated with atrial septal defects, atrioventricular valve obstruction and prolapse, pulmonary venous obstruction and arrhythmias. Its significance as an isolated finding is not clearly known. Materials and methods Retrospective study (2011-2016) including 29 fetuses with ASA, defined as a redundant atrial septal tissue extending at least halfway across the left atrium diameter. Data on prenatal, perinatal and postnatal outcome was reviewed. Results ASA was diagnosed in 28 fetuses at a mean gestational age of 33.2 weeks. Fetal echocardiography was performed mainly for the suspicion on screening ultrasound. Eighteen fetuses (62%) presented other cardiac abnormalities, to highlight significant right heart dominance, present in 15 cases. Four of which were considered as with high risk for aortic coarctation. Chromosomal abnormality was present in one case with a significant VSD, in which TOP was performed. GA at delivery, birthweight and Apgar score, were normal in all the newborns. Postnatal follow-up was available for all newborns, with a mean follow-up of 29 months. Aortic coarctation was not confirmed in any case despite right dominance, while pulmonary hypertension and mitral stenosis was diagnosed in one case prenatally considered of high risk for aortic coarctation. Atrial-septal defect was present in 11(38%) cases after delivery, with spontaneous closure before one and two years in 7 and 1 cases respectively. Conclusions Our results support the convenience of performing a postnatal echocardiography in prenatally diagnosed ASA, in order to exclude the presence of atrial-septal defects.

COMPARATIVE STUDY BETWEEN EARLY FOETAL ECOCARDIOGRAPY PERFORMED AT 13-14 WEEKS AND AT 16 WEEKS GESTATION

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Introduction Many of the congenital heart diseases (CHD) can be diagnosed or suspected as early as the first trimester of gestation. One of the main limitations for the early diagnosis of CHD is foetal heart size. Objective To compare foetal echocardiography performed at 13-14 weeks gestation, through vaginal and abdominal scan, to foetal echocardiography performed at 16 weeks gestation, through abdominal scan, in two study populations: low BMI (25) and high BMI (≥ 25). Material and methods This is a prospective, non-randomized study. An advanced foetal cardiac examination was performed on each patient at 13-14 weeks of gestation by transvaginal and abdominal routes and at 16 weeks, by the abdominal route. Results A total of 47 patients were recruited, 23 with a BMI 25. The ultrasound examination was successful in 95.7% at 13-14 weeks, in at least one of the routes (vaginal or abdominal), and in 94, 8 % at 16 weeks gestation. The best route for the ultrasound scan at 13-14 weeks in patients with BMI 25 the vaginal route was the best. The 16 weeks scan was the fastest while the slowest was the vaginal route at 13-14 weeks. Conclusions Foetal cardiac examination at 13-14 weeks may be as successful as screening at 16 weeks in patients with low and high BMI. The transvaginal route is an alternative to the abdominal route in patients with a poor acoustic window.

BIVENTRICULAR FUNCTION IN FETUSES WITH AORTIC COARCTATION

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Background: In fetal life, aortic coarctation (AC) induces significant right ventricular dominance, but no specific ventricular functional pattern has been described. **Methods:** a comprehensive echocardiography was performed at third trimester of pregnancy in 21 fetuses with confirmed AC (2011-2016). Two gestational-age-matched controls were selected for each case. Gestational age (GA), estimated fetal weight (EFW) and standard morphometric and Doppler parameters were obtained. Biventricular systolic and diastolic function was assessed by M-mode, pulse-wave and tissue Doppler imaging (TDI) techniques, including: stroke volume (SV), cardiac output (CO), peak ventricular filling velocities and ratio (E/A ratio), mitral and tricuspid annular displacement (MAPSE and TAPSE) and peak annular velocities (S', E', A' and E/E' ratio). **Results:** GA and EFW at echocardiography were similar between groups (31.2 vs. 32.2 and 2034g vs. 1837g, p=0.3). Fetuses with AC showed a higher tricuspid to mitral ratio (1.5 vs. 1.03, p=0.001) with significant tricuspid regurgitation and reverse flow at the aortic isthmus in 27% and 25% of cases, respectively. While the left function was mainly preserved, the right ventricle showed an elevated cardiac output (421 vs. 226 ml/kg/min, p=0.001) compared to controls, which was associated with an increased longitudinal function: higher E' (9.21 vs. 7.69 cm/s, p=0.006) and S' (8.02 vs. 7.37 cm/s, p=0.037) velocities, and signs of diastolic dysfunction: decreased E/A (0.69 vs. 0.77, p=0.028) and E/E' ratios (5.1 vs. 5.9, p=0.042). **Conclusions:** Right ventricular dominance is associated increased right ventricular longitudinal systolic function and abnormal diastolic function in fetuses with confirmed AC. Despite a lower stroke volume, left ventricular functional parameters remains relatively preserved.

Hypertension in Pregnancy

USEFULNESS OF THE PROTEINURIA - CREATININURIA INDEX (IPC) AS AN ISOLATED SAMPLE REGARDING 24 - HOUR PROTEINURIA IN PATIENTS UNDERGOING PREECLAMPSIA. PILOT STUDY AT A REGIONAL REFERRAL CENTER IN CHILE.

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INTRODUCTION: Preeclampsia (PE) is a pathological entity with an approximate incidence in our country of 3-5%. For diagnosis, two blood pressure values separated by 6 hours (140/90 mmHg), associated with proteinuria in 24 hours 300mg are required. This test is difficult and delays up to 48 hours diagnosis. Therefore, an index, the proteinuria: creatininuria (IPC) ratio in an isolated sample, was evaluated for the diagnosis of PE. **OBJECTIVE:** To evaluate the clinical utility of IPC in our center, related to the results of proteinuria in 24 hours. **MATERIAL AND METHOD:** A database was made, recording results of IPC and proteinuria in 24 hours. We take values of IPC ≥ 0.3 and of 300 mg in 24-hour proteinuria for diagnosis of Pre-eclampsia. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and Likelihood Ratios (LR) were calculated for the evaluation. **RESULTS:** There were 47 women. 5 were False Positives, 7 False Negatives, 23 True Negatives and 11 True Positive. The sensitivity of the index was 61% and the specificity was 82%, with a PPV of 68% and a NPV of 76%. The positive LR was 3.3 and the negative LR was 0.4. **CONCLUSION:** The sensitivity, positive predictive value and negative LR presented do not allow us to postulate the IPC as a diagnostic index for pre-eclampsia at present. However, both the specificity and the positive LR, would allow us to consider a CPI at 0.3 as a high suspicion value of PE.

ASSESSMENT OF THE RELATIONSHIP OF TARGET BLOOD PRESSURE IN PREGNANCY HYPERTENSION WITH ADVERSE MATERNAL AND PERINATAL OUTCOMES

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The aim of our study was to estimate the impact of achieving the target blood pressure (BP) $\leq 140/90$ mm Hg to 27-28 weeks of gestation on adverse maternal and perinatal outcomes in women with chronic (CH) and gestational hypertension (GH). In a prospective cohort study were included 300 pregnant women: group 1 - 103 women without achieving target BP (74 with CH, 29 with GH); group 2 - 97 women who achieved target BP (53 with CH; 44 with GH); control group - 100 women without hypertension. Women without achieving target BP (gr. 1) were more often had IUGR (14.6% vs 2.0%, $p=0.002$), PE (27.2% vs 3.1%, $p=0.001$); stillbirth (4.9% vs 0%, $p=0.06$), premature delivery (27.2% vs 3.1%, $p=0.001$) and SGA babies (24.3% vs 3.1%, $p=0.001$) compared to gr. 2. In gr. 1 a higher frequency of allele D of ACE gene (I/D) and C allele of ATR1 gene (A1166C) and allele M of ATG gene (T174M) were observed and compared with gr. 2 and a control gr. The factors independently associated with combined adverse outcome (IUGR \pm premature delivery \pm SGA) in logistic regression analysis were: previous premature delivery (OR 5.93, 95% CI 1.83-19.2; $p=0.003$), PE during pregnancy (OR 3.68, 95% CI 1.48-9.16; $p=0.005$) and achievement of target BP $\leq 140/90$ mm Hg to 27-28 weeks of gestation (OR 0.12, 95% CI 0.05-0.28; $p=0.001$). Achievement of target BP in pregnant women to 27-28 weeks of gestation may be partly based on renin-angiotensin system gene polymorphisms. Failure to achieve target BP is associated with adverse maternal and perinatal outcomes.

PLACENTAL EXPRESSION OF ERYTHROPOIETIN AND CELL RENOVATION MARKERS IN EARLY-ONSET AND LATE-ONSET PREECLAMPSIA

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The aim of our research was to study erythropoietin (EPO) placental expression in early-onset and late onset preeclampsia (PE). In a case-control study we included 15 pregnant women with early-onset PE and 13 women – with late-onset PE. We have studied placental expression of EPO, cell proliferation marker ki-67, markers of antiapoptosis bcl-2 and proapoptosis p53 in syncytium, capillaries endothelium, villi stroma macrophages. In early-onset and late-onset PE EPO expression was a higher ($p=0.001$) in villi syncytium (31.61 ± 1.05 and 27.57 ± 0.79 respectively) in comparison with expression in capillaries endothelium (24.94 ± 0.86 and 19.71 ± 0.58 respectively) and in stroma macrophages (25.94 ± 0.85 and 21.07 ± 0.91 respectively). Placental expression of EPO in early-onset PE were higher than in late-onset PE ($p=0.001$). In early-onset PE bcl-2 expression was lower in syncytium (5.22 ± 0.78 vs 10.21 ± 0.75 , $p=0.001$) and stroma macrophages (29.94 ± 0.83 vs 32.86 ± 0.75 , $p=0.022$) and higher in capillaries endothelium (16.72 ± 0.42 vs 15.14 ± 0.55 , $p=0.02$) compared to late-onset PE. In early-onset PE p53 expression was lower in syncytium (7.89 ± 0.59 vs 11.93 ± 0.63 , $p=0.001$), capillaries endothelium (3.89 ± 0.54 vs 6.43 ± 0.42 , $p=0.002$), stroma macrophages (9.94 ± 0.74 vs 15.07 ± 0.83 , $p=0.001$) and ki-67 expression was enhanced (24.61 ± 0.89 vs 19.85 ± 0.95 , $p=0.005$; 20.28 ± 0.70 vs 14.93 ± 0.62 , $p=0.001$; 24.33 ± 0.99 vs 17.86 ± 0.94 , $p=0.001$ respectively) compared to late-onset PE. Placental EPO-expression increases in early-onset PE that is probably compensatory-adaptive reaction. Despite the high expression of EPO, the degree of adaptive changes, particularly in syncytium, was insufficient and that

was accompanied by dystrophic changes in placenta (ischemic infarcts, immature chorionic villi) with the realization of proapoptosis and cell proliferation programs.

MATERNAL BIOCHEMICAL MARKERS IN SEVERE PREECLAMPSIA

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Introduction Preeclampsia is considered as a failure of body's adaptive mechanisms. Maternal immune system is involved in maternal endothelial dysfunction and the subsequent systemic reaction seen in preeclampsia. Studying production of pro-inflammatory (IL-1 β , IL-8), anti-inflammatory (IL-10), CRP and TNF alpha in moderate and severe preeclampsia in third trimester of pregnancy. Patients and methods 50 women with pregnancies complicated by preeclampsia were evaluated in the third trimester of pregnancy and 50 women with normotensive pregnancy. Levels of IL-1 β , IL-8, IL-10, and TNF alpha were measured by using a solid-phase enzyme immunoassay. Statistical data processing was done using the application program SPSS for Windows 13, 0. To describe the distribution of analyzed variables was used descriptive methods (mean, median, minim and max). Results IL-10 in severe preeclampsia has a downward trend, IL-8 is a relatively stable parameter, and CRP (C-reactive protein) levels tend to be higher in women at the risk of developing preeclampsia. Increasing levels of TNF-alpha IL- β between 28-40 weeks of gestation may be considered a prognostic marker for the development of preeclampsia. Conclusion In conclusion cytokines play critical, essential roles in signaling between cells of the immune system, with a prolific range of regulatory activities including the recruitment, activation, stimulation, killing, and suppression of immune and nonimmune cells.

THIRD TRIMESTER OF PREGNANCY AND MATERNAL CYTOKINES

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Aim The purpose of the actual study was to evaluate the relationship between the formation of anti-inflammatory IL10 cytokine and several indicators of moderate and severe preeclampsia in the third trimester of pregnancy. Material and methods Examination of the indicators of preeclampsia and maternal IL10 levels was conducted in 50 women with pregnancies complicated by varying degrees of preeclampsia in the third trimester of gestation and in 50 normotensive patients, hospitalized at the University Clinic of Gynecology and Obstetrics, Skopje, Republic of Macedonia. Patients with preeclampsia were categorized into moderate and severe preeclampsia group according to the degree of preeclampsia. Logistic regression analysis was used to determine the predictive value of the different parameters for the occurrence of severe preeclampsia. Results The regression analysis detected systolic blood pressure of 160 mmHg or higher, diastolic blood pressure of 100 mmHg or higher, persistent proteinuria in pregnancy, serum LDH concentration of 450 U/L or higher and reduced serum concentrations of IL10 as significant predictors of severe preeclampsia in pregnant women after adjusting for age. Conclusion The findings of significantly lower IL10 concentrations in serum in patients with severe preeclampsia in comparison with respective concentrations in patients with moderate preeclampsia can be considered as major pathognomonic laboratory sign of severe preeclampsia. Key words Indicators, preeclampsia, cytokines, biochemical markers, correlation

THE PREECLAMPSIA AND CHRONIC ARTERIAL HYPERTENSION: THE RISK OF MATERNAL AND NEONATAL ADVERSE OUTCOMES

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Preeclampsia is the one of the most common complications of pregnancy. We have analysed the history of 77 cases of mild and severe preeclampsia (including HELLP syndrome) in 2014-2015 year. We have also performed a telephone survey in order to learn whether patients have high arterial blood pressure (140/90 mmHg) after birth. The incidence of chronic arterial hypertension/the fetal growth restriction was 41% and 49% respectively. In the group with the chronic arterial hypertension the rate of the fetal growth restriction syndrome was 40,7%. The prevalence of caesarean section and natural birth was 88% (the medium age of gestation = 35,2 weeks (SD+/-3,28 weeks) and 12% (38,2 weeks, +/- 2 weeks) respectively in the common group. In the group with the chronic arterial hypertension and without fetal growth restriction the Apgar score at the 1st and 5th minute was the 7,4 and 8,2 respectively compared to the group with fetal growth restriction and without chronic arterial hypertension 6,3 and 7,25 respectively (p=0,05). The incidence of adverse neonatal outcomes (cerebral palsy) was 6.8% and was strongly associated with the fetal growth restriction syndrome (p=0,01). According to the survey, the prevalence of the postpartum arterial hypertension after birth in the group with chronic arterial hypertension before pregnancy was 50%. The 17% women without chronic arterial hypertension before pregnancy have the chronic arterial hypertension after birth. The adequate postpartum management of women with preeclampsia with/without chronic arterial hypertension is the key factor of the future prevention of cardiovascular disease.

USE OF CORTICOSTEROIDS IN HELLP SYNDROME IN SECOND TRIMESTER OF PREGNANCY

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BACKGROUND 4-18% of de cases of preeclampsia will become severe or evolve into HELLP syndrome. Use of corticosteroids has been proposed as management of HELLP syndrome, especially for thrombocytopenia. CASE REPORT Pacient Information Primiparous, 41 years old. Pregnancy of 25+6w, obtained with assisted fertilization treatment. During antenatal visit at Clinica Tabancura for IUGR stage 2, elevated blood pressure was found. She was admitted to the clinic. Initial Diagnosis Patient persisted with elevated blood pressure. 24-hour protein was 7,5 grs. On laboratory tests, no severe features was shown. PIERS 4,4%. Fetal growth was lower then 1th percentil, with vasodilation of MCA, and elevated PI of ductus venosus. On the third day patient developes hypertensive crisis, and laboratory parameters showed Hellyp syndrome. The patient was taken to Intesive care unit. Intervention On the ICU Labetalol was used for the management of elevated blood pressure. GOT:75, Plateletes 98.000, LDH: 811. PIERS 12,3%. Dexametason (10mg 2 times a day, iv) was started. After 24 hours patient was stable without hypertensive crisis, improvement of severe features and fetal doppler (normalization of VD). PIERS 4,6%. After 48 hour methylprednisolone 40 mg 2 times a day, was started. Results Maternal and fetal conditions were stable up to 7 days after starting of corticosteroids administration. After that, she presented recurrent hypertensive crisis and delivery was indicated. CONCLUSIONS The use of dexametasone/methylprednisolone might be

beneficial in patients with early onset HELLP syndrome, under strict management in intensive care unit. Further studies are needed to determine the real effectiveness.

IMPACT OF MATERNAL OBESITY ON PREGNANCY OUTCOMES IN WOMEN WITH PREECLAMPSIA

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Introduction The role of obesity to increase Type 2 diabetes and cardiovascular disease prevalence is well recognized. However, obesity also has important implications for pregnancy outcomes. In addition to “mechanical issues” associated with morbid obesity there is an increased frequency of other adverse outcomes. Aim was to examine the impact of maternal obesity on maternal and neonatal outcomes in pregnancies complicated with Preeclampsia. **Patients and methods** This retrospective cohort study was conducted from 2005 to 2015 among prime gravid women with a singleton uncomplicated pregnancy with cephalic presentation of 38 weeks of gestation or more, we collected data about height and weight of participants during the first prenatal care, after the positive pregnancy test was done. Then the body mass index (BMI) was calculated according to the formula (referenca): $BMI = \text{weight (kg)} / [\text{height (m)}]^2$. During labour and birth, data about the: preeclampsia, induction of labour, caesarean section, preterm delivery, postdate delivery, and weight of the newborn were collected. **Results** Women with an above-normal Body Mass Index had a higher incidence of preeclampsia, induction of labor, caesarean section, pre-term labor, and macrosomia than women with a normal Body Mass Index (controls). There was no significant difference in the incidence of post-term delivery between the control group and other groups. **Conclusion** Increased BMI increases the incidence of induction of labor, caesarean section, pre-term labor and macrosomia.

INTRAUTERINE GROWTH RESTRICTION AND PLACENTAL GENE EXPRESSION IN SEVERE PREECLAMPSIA, COMPARING EARLY-ONSET AND LATE-ONSET FORMS

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Objective: To evaluate placental gene expression in severe early- or late-onset preeclampsia with intrauterine growth restriction compared to controls. **Study Design:** Chorionic villus sampling was conducted after cesarean section from the placentas of five women with early- or late-onset severe preeclampsia and five controls for each preeclampsia group. Microarray analysis was performed to identify gene expression differences between the groups. **Results:** Pathway analysis showed over-representation of GO biological process terms related to inflammatory and immune response pathways, platelet development, vascular development, female pregnancy and reproduction in early-onset preeclampsia. Pathways related to immunity, complement and coagulation cascade were over-represented in the hypergeometric test for KEGG database. Ten genes (*ABI3BP*, *C7*, *HLA-G*, *IL2RB*, *KRBOX1*, *LRRC15*, *METTL7B*, *MPP5*, *RFLNB* and *SLC20A*) had a $\geq \pm 1$ fold expression difference in severe early-onset preeclampsia group compared to early controls. There were 362 genes that had a $\geq \pm 1$ fold expression difference in severe early-onset preeclampsia group compared to late-onset preeclampsia group including *ABI3BP*, *C7*, *HLA-G* and *IL2RB*. **Conclusion:** There are significant differences in placental gene expression between severe early- and late-onset preeclampsia when both are associated with intrauterine growth restriction. *ABI3BP*, *C7*, *HLA-G* and *IL2RB* might contribute to the development of early form of severe preeclampsia.

DIASTOLIC BLOOD PRESSURE IS A POTENTIAL MODIFIABLE RISK FACTOR FOR PREECLAMPSIA IN WOMEN WITH TYPE 1 AND TYPE 2 DIABETES

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Aim: To assess the prevalence of pregnancy-related hypertensive disorders and to identify early clinical, modifiable predictors of preeclampsia in women with type 1 and type 2 diabetes. **Methods:** A population-based cohort study of 494 women with pre-existing diabetes (307 type 1 and 187 type 2 diabetes), included at their first antenatal visit (11±6 weeks of gestation (mean±SD)) from 2012 to 2016. The prevalence of microalbuminuria, diabetic nephropathy, retinopathy, chronic hypertension, gestational hypertension and preeclampsia was recorded. Predictors of preeclampsia present at first antenatal visit were sought identified. **Results:** At the first antenatal visit HbA1c was 6.9±2.3 % (50.8±10.1 mmol/mol) vs. 6.8±2.6 % (48.7±13.7 mmol/mol) and blood pressure 120±12/76±8 mmHg vs. 122±14/79±10 mmHg, $p=0.16/p=0.001$ in women with type 1 and type 2 diabetes, respectively. The prevalence of microalbuminuria was 6% (6% vs. 6%) diabetic nephropathy 1% (1% vs. 2%) and chronic hypertension (without diabetic nephropathy or microalbuminuria) 6% (3% vs. 10%, $p=0.003$). Preeclampsia developed in 8% (9% vs. 7%) and gestational hypertension in 8% (9% vs. 6%). Univariate analysis identified nulliparity, presence of retinopathy, diabetic nephropathy including microalbuminuria and blood pressure as predictors of preeclampsia. At the first antenatal visit, presence of diabetic microangiopathy (nephropathy, microalbuminuria and/or retinopathy) and diastolic blood pressure, were independently, positively associated with the development of preeclampsia. **Conclusion:** The prevalence of pregnancy-induced hypertensive disorders was comparable between type 1 and type 2 diabetes. At the first antenatal visit, diastolic blood pressure was the only independent, potentially modifiable risk factor for preeclampsia, in women with pre-existing diabetes.

MISCONCEPTIONS ABOUT PRE-ECLAMPSIA AND ECLAMPSIA AS PREDICTORS OF POOR TREATMENT SEEKING BEHAVIOR CUM POOR PREGNANCY OUTCOMES: MIXED GENDER VIEWS IN NIGERIA.

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Introduction Although it is medically known that hypertension and significant proteinuria occurring after 20 weeks of gestation are disorders in pregnancy and diagnostic of pre-eclampsia which often leads to eclampsia if poorly managed, women and men in Nigeria misconceive importance of these findings. This phenomenal misperception could lead to inappropriate care-seeking behaviors and results in maternal and perinatal mortality. **Objective** This study evaluated misconceptions about pre-eclampsia and eclampsia and the resultant poor care-seeking behaviors and adverse pregnancy outcomes. **Methods** The study was cross-sectional, qualitative method involving 28 focused group discussions (FGDs) among rural and urban married men and women across 6 geopolitical zones in Nigeria. Four FGDs were conducted per state. A total of 224 men and women (n=112 per category) aged 18-49 years with personal, spousal or community experience of pre-eclampsia/eclampsia were

purposely selected. The interviews were recorded, transcribed, coded and analyzed with QSR Nvivo 11. Results Both men and women misconceived pre-eclampsia and eclampsia to be associated with witch crafty/evil spirit possessions/attack, and this misconception led to inappropriate health seeking behaviors with affected women seeking care either from faith-based leaders, traditional birth attendants or herbalist. Those who sought inappropriate care reported maternal death, fetal death/still birth, injuries including paralysis as the outcomes of their pregnancies. Conclusions Misperceptions of pregnancy complications such pre-eclampsia and eclampsia are major hindrances to uptake of quality maternal health care services. Improving community knowledge about causes of pre-eclampsia and eclampsia and where to seek appropriate treatment can reduce poor pregnancy outcomes.

DOPPLER ASSESSMENT OF THE UTERINE ARTERY IN PREGNANCIES WITH RISK FACTORS FOR PREECLAMPSIA

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Preeclampsia remains an important issue of Obstetrics, being a main cause of maternal and fetal morbidity and mortality. We have performed Doppler ultrasound of the uterine artery in the first and second trimester of pregnancy in women with risk factors, using the pulsatility index and/or the presence of the notch to predict the early onset of Preeclampsia.

Doppler examination of the uterine artery in the first trimester of pregnancy showed a pathological PI in 26.9% of the patients with Preeclampsia and in 13.8% in patients without Preeclampsia. Bilateral notch in the first trimester was found in 61.5% of the patients with Preeclampsia and in 41.5% of the patients without Preeclampsia. The global evaluation of altered Doppler parameters in the first trimester showed pathological PI, notch or their association in 65.4% patients with Preeclampsia and 48.9% of the patients without Preeclampsia. Doppler examination of the uterine artery in the second trimester of pregnancy showed a pathological PI in 53.8% of the patients with Preeclampsia and in 13.8% in patients without Preeclampsia. Bilateral notch in the second trimester was found in 34.5% of the patients with Preeclampsia and in 10.6% of the patients without Preeclampsia. The global evaluation of altered Doppler parameters in the second trimester showed pathological PI, notch or their association in 73.1 % patients with Preeclampsia and 23.4% without Preeclampsia.

Doppler examination of the uterine artery is an efficient non-invasive screening test for the onset of Preeclampsia in pregnancies with risk factors.

PRE-PREGNANCY LIVER ENZYME LEVELS AND THE DEVELOPMENT OF PREECLAMPSIA IN SUBSEQUENT PREGNANCY

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Purpose: The aim of this study was to investigate the association between pre-pregnancy liver function test and the development of preeclampsia. Methods: We enrolled 618,236 Korean women who had their first delivery between January 1, 2008 and December 31, 2014 and had undergone a national health screening examination through the National Health Insurance during the 1-2 years before delivery. Results: Preeclampsia developed in 12,315 (2.0 %). The rate of development of preeclampsia was higher in women with pre-pregnancy abnormal liver enzyme compared with those with normal liver enzyme. On multivariate analysis, women with abnormal alanine aminotransferase(ALT) had a 1.32-fold increased risk of developing preeclampsia compared to that in

those with normal ALT, after adjusting for age, family history of HTN, smoking, alcohol status, pre-pregnancy BMI and BP. Pre-pregnancy γ -glutamyl transferase and aspartate aminotransferase were not associated with the risk of development of preeclampsia. Conclusion: Abnormal pre-pregnancy ALT was associated with the development of preeclampsia in subsequent pregnancy. Further studies are needed to evaluate whether early intervention for liver function prior to pregnancy can decrease the risk of preeclampsia.

PREGNANCY INDUCED HYPERTENSION IN WOMEN WITH GESTACIONAL DIABETES MELLITUS.

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BACKGROUND AND OBJETIVES: Pregnancies complicated with gestational Diabetes Mellitus (GDM) are at higher risk of undergoing pregnancy-induced hypertension (PIH). This study could try to identify at an early stage markers that could define a population at risk of developing PIH and preeclampsia. **MATERIALS AND METHODS:** We performed a prospective case-control study within a sample of a total of 133 pregnant women (70 with GDM, 63 controls). Both groups were analyzed for clinical data, and perinatal and obstetrics results. **RESULTS:** The pregestational BMI was 27.31 ± 5.39 and 23.64 ± 3.95 , respectively ($p = 0.0001$). The rate of PIH in GDM was 7% and 3% in controls, and the rate of preeclampsia was 4% and 3% respectively (no significant differences). Weeks at delivery were $38,97 \pm 1,50$ vs. $39.64 \pm 2,11$ ($p=0.04$); caesarean delivery 28% vs. 9% ($p=0.006$); and macrosomia 14 vs. 4% ($p=0.006$). Women with GDM who developed PIH had a higher BMI ($P=0.001$) than controls. **CONCLUSIONS:** Pre-pregnancy maternal obesity is the most important modifiable risk factor for the development of PIH in women with GDM. The effect of the other risk markers of PIH and the impact that could have on perinatal/obstetric morbidity should be studied more extensively

EARLY-ONSET PREECLAMPSIA IS ASSOCIATED WITH PERINATAL MORTALITY AND SEVERE NEONATAL MORBIDITY

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Objective: To evaluate neonatal outcomes of pregnancies complicated by early-onset preeclampsia (PE) and compare these outcomes to those of gestational age matched neonates born to mothers whose pregnancy was not complicated by early-onset PE. **Methods:** We analyzed the outcome in 97 neonates born to mothers with early onset PE (24-32 weeks amenorrhea at diagnosis) and compared it to that of 680 gestational age-matched neonates born between 25-36 weeks due to other etiologies and admitted to the Neonatal Intensive Care Unit of a tertiary referral hospital in the Netherlands. We used Chi-square test, Wilcoxon test, and logistic regression analyses. **Results:** Neonates born to PE mothers had a higher perinatal mortality (13% vs. 7%, $p=0.03$) and infant mortality (16% vs. 9%, $p=0.03$), a 20% lower birth weight (1150 vs. 1430 grams, $p0.001$), were more often SGA (22% vs. 9%, $p0.001$) and had more neonatal complications as compared to neonates born to mothers without PE. **Conclusions:** Overall adverse perinatal outcome is significantly worse in neonates born to mothers with early onset PE. The effect of early-onset PE on perinatal mortality seems partially due to SGA. Whether these differences are due to uteroplacental factors or intrinsic neonatal factors remains to be elucidated.

PATTERN RECOGNITION LECTINS IN PATHOGENESIS AND PREDICTION OF CLINICAL PREECLAMPSIA IN FIRST TRIMESTER OF PREGNANCY

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Background: Previously we identified recruitment of pattern recognition lectins from maternal circulation to preeclamptic placenta for specific-binding and clearance of apoptotic trophoblasts. Subsequent lectin-complement pathway activates local and systemic innate immunity and triggers oxidative stress responses in preeclamptic women. **objective:** To detect changes of circulating lectins and soluble apoptotic proteins from the first trimester of pregnancy to the clinical syndrome of preeclampsia developed. **Methods:** Nested case control cohort of pregnancies for non-invasive prenatal diagnosis, dating and morphological scans, and OGTT screening. **Results:** Plasma lectins and apoptotic proteins increased in both normal and preeclamptic pregnancies. Compared with normal pregnancies, H-ficolin, L-ficolin and MBL concentrations were significantly lower in first, second and third trimesters of preceded preeclampsia, suggesting defective trophoblast signaling to maternal decidua become weak and fail to stimulate normal innate immune collaboration. These changes of lectins in preeclamptic pregnancies corresponded with significant increased apoptotic Fas and TRAIL proteins in the first trimester, indicating poorly perfused placenta result in trophoblast apoptosis in early pregnancy. Compared with placental angiogenic markers endoglin and sFlt/PlGF, abnormal changes in lectins and apoptotic proteins can be detected as early as in 8 weeks of gestation, at least 25 weeks before clinical preeclampsia established, revealing defected trophoblastic innate immune response and inhibited villous angiogenesis prior to poor spiral vessel modeling in preeclamptic placenta. **Conclusion:** Superior early changes in lectins and apoptotic proteins than angiogenic factors not only dictate the underlying pathogenesis of preeclampsia, but also predict the risk of clinical preeclampsia in the first trimester of pregnancy.

Labor and Delivery

MATERNAL OUTCOME AFTER COMPLETE UTERINE RUPTURES

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Objective: To identify risk factors associated with serious maternal outcome following complete uterine ruptures. **Methods:** we studied medical records of 250 complete uterine ruptures, identified through medical birth registry of Norway (MBRN) and patient administration system (PAS), in all maternities (1967-2008) (N= 2 209 506). Cross tabulations and logistic regressions were applied. **Results:** Complete ruptures comprised 167 scarred and 83 unscarred uteri, resulting in 161 severe PPH (64.4%), 51 hysterectomies (20.4%), and 3 maternal deaths (1.2%). Ruptures in unscarred vs scarred uteri had significantly higher risk for severe PPH (AOR: 5.0; 95% CI: 2.3-10.9) and hysterectomy (AOR: 2.6; 95% CI: 1.3-5.3), adjusted for decades of births. Ruptures of unscarred uteri were outside lower uterine segment (LUS) in 78.3% while only 25.1% of scarred uteri ruptures were outside LUS. Adjusted for unscarred uteri and decades of birth, Severe PPH was significantly increased by maternal age ≥ 35 years old (AOR: 2.0; 95% CI: 1.1-3.9), Parity ≥ 3 (AOR: 4.3; 95% CI: 1.5-12.3), Induced labour (AOR: 2.0; 95% CI: 1.1-3.7), prolonged second stage (AOR: 2.2; 95% CI: 1.2-4.2), Manipulation at delivery (OR: 6.5; 95% CI: 1.4-30.0), and Postpartum detection of rupture after vaginal delivery (AOR: 5.0; 95% CI: 2.2-11.7). Hysterectomy increased by maternal age ≥ 35 years old (OR: 3.3; 95% CI: 1.6-6.9), Parity ≥ 3 (OR: 3.6; 95% CI: 1.5-12.3), and postpartum detection (OR: 2.1; 95% CI: 1.1-4.3). **Conclusion:** Ruptures of unscarred uteri, manipulation, and postpartum

detection significantly increased serious maternal outcome, indicating delayed diagnosis, and catastrophic rupture site in these mothers.

PERINATAL OUTCOME AFTER COMPLETE UTERINE RUPTURE

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Objective: To identify risk factors associated with serious perinatal outcome following complete uterine ruptures.

Methods: we studied medical records of 256 births with complete uterine ruptures after start of labour, identified through Medical Birth Registry of Norway and Patient Administration System), in all births (1967-2008) (N= 2 236 959). Cross tabulations and logistic regressions were applied. **Results:** Births with complete ruptures comprised 169 scarred and 87 unscarred uteri, resulting in 38 intrapartum fetal deaths (14.8%), 26 neonatal deaths (10.2%), 22 hypoxic encephalopathy (8.6%), and 95 admissions to neonatal intensive care unit (NICU) (37.1%). Ruptures in unscarred vs scarred uteri were not significantly associated with increased serious perinatal outcome. Ruptures occurring in the 1967-1977 vs ruptures in 2000-2008 were significantly associated with increased intrapartum fetal deaths (OR: 16.9; 95% CI: 6.5-44.0). Adjusted for decades of births, Intrapartum fetal deaths were significantly increased with sudden loss of contractions (AOR: 5.0; 95% CI: 1.9-13.4), placental abruption (AOR: 21.4; 95% CI: 6.5-69.9), and infant in abdominal cavity (AOR: 4.8; 95% CI: 1.6-14.5). Neonatal deaths were significantly increased with placental abruption (AOR: 3.9; 95% CI: 1.6-9.2). Hypoxic encephalopathy was increased by prolonged second stage of labour (AOR: 4.6; 95% CI: 1.7-12.3), instrumental vaginal delivery (AOR: 5.7; 95% CI: 2.1-15.0), and postpartum rupture detection after vaginal delivery (AOR: 2.7; 95% CI: 1.1-7.1). **Conclusion:** Placental abruption, sudden contractions loss, and infant expulsion into abdominal cavity increased the risk for perinatal deaths following ruptures while postpartum diagnosis of rupture after vaginal delivery is more associated with infant morbidity

PREGNANCY OUTCOMES IN WOMEN WITH GESTATIONAL DIABETES: RISK-STRATIFICATION AS A TOOL TO OPTIMISE PERIPARTAL AND POSTPARTUM CARE

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Objectives: Previous studies indicate, that gestational diabetes mellitus (GDM) might be etiopathogenetically diverse metabolic abnormality posing unequal risks and for distinct subgroups of GDM women at the time of delivery and postpartum. We therefore retrospectively classified cohort of GDM women into "high" and "low" risk and conducted case-control study to compare (i) the incidence of peripartal morbidity and (ii) to analyse the potential effect of selected comorbidities (i.e. obesity, hypertension, thyreopathy, polycystic ovary syndrome, trombophilia, anemia, allergy and smoking) on pregnancy outcomes. **Methods:** Using a cohort of 364 women with GDM following parameters were assessed: ultrasound examination before delivery, gestational week, duraton of labour, need for induction, perinatal complications, post-delivery complications, section, abnormality in pH, base excess, Apgar score, offspring's birth weight. GDM was diagnosed by oGTT test in 24-28th week of gestation. Criteria for "high risk" GDM group were: BMI $\geq 30\text{kg/m}^2$, hypertension in pregnancy, need for insulin therapy, macrosomia, weight gain during pregnancy $\geq 20\text{kg}$. **Results:** "High risk" GDM subgroup revealed significantly more frequent labour inductions (P=0.0004), Caesarean sections (P=0.0017) and instrumental deliveries (P=0.0013, all chi-square test).

New-borns of “high risk” GDM mothers had significantly more often worse perinatal outcomes (Apgar score and macrosomia, chi-square test). Conclusion: Risk stratification of GDM subjects appears justified and might be a reliable tool for personalisation of prenatal and obstetric care. The possibility to predict also maternal postpartum metabolic outcomes using such risk stratification is a subject of our ongoing studies. Acknowledgement: Grant of Czech Ministry of Health no. 16-28040A

CERVICAL BALLON VS VAGINAL PROSTAGLANDINS FOR CERVICAL RIPENING AND LABOR INDUCTION AT TERM.

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Background: Transcervical balloon catheters provide an alternative to prostaglandins for labor induction, particularly when these are not available or are contraindicated. Objective: To compare the interval to active stage of labor (4 centimeters of cervical dilatation) in pregnant at term who underwent labor induction and cervical ripening with mechanical [double balloon catheter (DBC)] vs nonmechanical cervical ripening agents [vaginal prostaglandins (Dinoprostone or Misoprostol)]. Materials and methods: We performed a prospective observational study in our hospital of 60 pregnant. Inclusion criteria were women with singleton gestations at term, without previous cesarean section, who underwent labor induction. Women were subdivided into three groups according to the method of labor induction: Group A [mechanical cervical ripening agents (20 patients)], group B [vaginal dinoprostone (20 patients)], and group C [vaginal misoprostol (20 patients)]. The groups were compared regarding time from induction until active stage of labor. Results: The mean gestational age for induced labors was 39 weeks and the mean baseline Bishop scores were 3.25 (groups A and B) and 4.2 (group C). The time from induction until delivery differed between the three groups: 6.75 hours (group A), 8.6 hours (group B) and 7.4 hours (group C). There was no difference between the groups in terms of neonatal outcomes. Conclusion: Labor induction with mechanical cervical ripening agents is safe, effective and successful regardless of the initial Bishop score, gestational age or parity. It does not influence neonatal outcomes.

FETAL MIDDLE CEREBRAL ARTERY DOPPLER AT 40 WEEKS` GESTATION IN THE PREDICTION OF EMERGENCY DELIVERY FOR FETAL DISTRESS IN LABOR.

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Objective: To evaluate whether fetal middle cerebral artery pulsatility index (MCA PI) and cerebro-placental ratio (CPR) were associated with emergency delivery for fetal distress during labor in normal fetuses at term of pregnancy. Methods: Prospective cohort of singleton pregnancies with an estimated fetal weight 10th centile at routine third trimester ultrasound underwent a scan for the assessment of fetal MCA PI and umbilical artery PI in the context of the 40 weeks' visit. In all cases, Doppler assessment was carried out within 7 days of delivery. The relationship between Doppler measurements

and the risk of emergency delivery for fetal distress was analyzed by logistic regression. Results: From a total of 403 pregnancies, 75 fetuses (18.6%) showed signs of fetal distress during labor requiring an emergency cesarean section (n=57, 76%) or operative vaginal procedure (n=18, 24%). Compared with the 328 fetuses undergoing a normal vaginal delivery, those 75 fetuses had a significantly lower mean MCA PI (1.30 vs. 1.16; p=0.001) and mean CPR (1.78 vs. 1.61; p=0.001) at the time of the 40 weeks' examination. Multivariate analysis showed that a significant contribution to the need for emergency delivery for fetal distress was only provided by mean MCA PI (p=0.001). Detection rate (DR) was 49% and 63% for a false positive rate (FPR) of 20% and 30%, respectively (AUC: 0.70 [95%CI: 0.62-0.77]). Conclusions: In normal term fetuses, a low MCA PI is associated with an increased risk of emergency delivery for fetal distress during labor. Larger prospective studies are required.

DELIVERY MODE CHANGES IN PATIENTS WITH TYPE 1 & 2 DIABETES MELLITUS DURING THE TWO DECADES

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Background and aims: The aim of study was to analyse delivery mode changes in women with diabetes mellitus type 1 (T1DM) & type 2 (T2DM) in tertiary unit centre in Bratislava. Methods: The retrospective study was based on hospital data obtained in the 1st Department of Obstetrics & Gynaecology in 2 periods of years: 1994 - 2000 and 2003 - 2015. Results: Frequency of caesarean section (CS) in T1DM before 2000 year was 36 %, but after that increased to 77 % (p 0.0001). Frequency of CS in T2DM before 2000 year was 56 %, but after that increased to 70 %. Total frequency of CS in patients with T1DM & T2DM increased during observed period from 39 % to 76 % (p 0.0001). During observed period general frequency of CS in Slovakia increased from 11.3 to 30.2 %. Preparation for pregnancy before the year 2000 had 12 % of diabetic mothers, after 2000 it was only 9 %. Mean maternal age at the time of delivery in general population increased in Slovakia since 1994 to 2015 from 25.6 to 29.5 year. In T1DM increased mean age from 24.4 to 28.3 years, but in T2DM decreased from 35 to 33 years. Conclusions: In the new millennium the frequency of CS in diabetic mothers (T1&T2 DM) is increasing, preparation for pregnancy is worsening and the childbearing age is increasing. It is very important to improve preparation for pregnancy in all young diabetic women in childbearing age.

CLINICAL AND ULTRASONOGRAPHIC MODEL FOR PREDICTION OF FAILED CERVICAL RIPENING AT TERM

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Objective To develop a model combining clinical and ultrasonographic parameters, able to predict failure of cervical ripening at term. Methods Prior to placement of intracervical Foley catheter and/or prostaglandin administration, ultrasonographic images of uterine cervix were obtained. 75 variables were selected for testing. Findings were blinded to clinicians. Main outcome was failed cervical ripening, defined as the failure to achieve active labor after mechanical or pharmacological methods. Clinical information, offline image measurements and outcomes of IOL were collected. Logistic regression analysis was performed to develop the predictive model. Results 218 singletons at term, with unfavourable cervical conditions (Bishop's score ≤ 6) and medically indicated induction of labor were consecutively recruited for participation. Main outcome occurred in 42.7% (93/218) of patients. After discarding collinear variables, forward stepwise logistic regression with remaining

characteristics resulted in a model including 9 parameters: antepartum BMI \geq 25, previous vaginal delivery, use of dinoprostone for cervical ripening, PROM, presence of IUGR fetus, gestational age at start of procedure, Bishop's index, cervical length and shortening of the cervix while applying fundal pressure. Area under the ROC curve was 0.8756. A cutoff point \geq -0.4783 was suggested to predict failed cervical ripening, with values of sensitivity, specificity, positive and negative predictive values of 78.6%, 80.0%, 75.9% and 82.4%, respectively. 79.4% of patients were correctly allocated. Conclusions This model adequately predicted patients with a high probability of failed cervical ripening. The application of these findings could help to adequate IOL procedures, in order to select women who may benefit from different strategies.

A CASE OF UTERINE SCAR RUPTURE FOLLOWING THREE PREVIOUS MYOMECTOMIES

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Uterine scar rupture in pregnancy is an obstetric emergency with risk of maternal and fetal mortality. The incidence of uterine scar rupture following a myomectomy is reported in literature to be between 0.4-1%. A large proportion of these cases occurred after one myomectomy, in the third trimester and before trial of labour. We report a case of a 46 year-old-female with a spontaneous uterine rupture at 26 weeks gestation. She had a history of an open myomectomy followed by two laparoscopic myomectomies prior to this pregnancy. She presented with an acute onset of severe lower abdominal pain, hypotension and tachycardia. Ultrasound performed revealed haemoperitoneum with a viable foetus. Emergent caesarean section was performed with uterine rupture site seen on the posterior uterine wall. Both mother and foetus survived. Caution must be exercised in performing repeated myomectomies in women desiring fertility.

CHARACTERISTICS OF WOMEN WHO NEEDED FETAL BLOOD SAMPLING DURING DELIVERY

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Objective: To evaluate the clinical characteristics of the parturients and neonates who needed fetal blood scalp sampling (FBS) during vaginal delivery. Methods: All pregnant women from 5/2013 to 10/2014 who delivered in Kuopio University Hospital and needed FBS for fetal reassurance (abnormal cardiotocography) during vaginal delivery were included. The data of maternal characteristics and neonatal outcomes were retrospectively collected and compared to normal parturient population in our hospital. Results: During the study period 187 women needed FBS during vaginal delivery attempt and 3564 babies were born. Excluding women who underwent elective Cesarean deliveries, FBS were taken in 5.3% of all parturients. Samples were taken more often in older (40 year-old 5.4% vs. 1.9%), nulliparous (70.8% vs. 40.6%) and women with higher BMI \geq 25 (45.4% vs. 34.0%). Deliveries were more often induced (42.2% vs. 24.9%) and with meconium-stained amniotic fluid (32.6% vs. 12.0%). Of sampled women, 48.1% delivered spontaneously and 51.9% underwent either Cesarean or vacuum deliveries. Compared to all deliveries and excluding elective cesarean sections during the study period there were 8,2% cesarean sections and 7,1% vacuum deliveries in our hospital. Apgar 7 at 5min age were a little lower (6,4% vs. 2,4%). Surprisingly, neonates with FBS sampling were less often admitted to NICU (11.8% vs. 14.3%) and UA pH values were equally often 7.0 (0.6% vs. 0.8%). Conclusion: Need for FBS is higher in nulliparous, older and obese women and after induction. However, nearly 50% of sampled women had spontaneous delivery and neonatal outcomes were comparable to general.

ELEVATED GLUCOSE LEVELS IN EARLY PUERPERIUM, AND ASSOCIATION WITH HIGH CORTISOL LEVELS DURING PARTURITION

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ABSTRACT Background: Gestational diabetes is one of the commonest metabolic problems associated with pregnancy

and an accurate diagnosis is critical for the care. Research has shown that pregnant women have high levels of cortisol during the last stage of parturition. As cortisol is a diabetogenic hormone causing increased glucose levels, we wanted to study the association between cortisol and glucose levels during parturition. Materials and methods: Glucose and cortisol were analyzed during parturition in 50 females divided according to slow (n.11) and normal labors (n.39). Blood samples were analyzed three times during the parturition and four times in the first day after delivery. Glucose levels were also measured once in each trimester. Results: In the normal group, the glucose concentration increased from 6.2 (IQR

5.6–8.0) mmol/L in the latency phase to 11.6 (10.0–13.3) mmol/L at aftercare (p0.05). After parturition the glucose concentrations decreased gradually. There were significant Spearman rank correlations between glucose and cortisol values. Conclusions: The changes associated with birth cause significant elevations of cortisol and glucose around parturition.

WATER BALANCE DURING PARTURITION AND EARLY PUERPERIUM:A PROSPECTIVE OPEN TRIAL

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Objectives: To investigate how water balance is regulated during labor and 27 h postpartum. **Design and methods:** A prospective open trial with 49 women giving birth vaginally. Ringer-acetate was infused intravenously and combined with epidural analgesia in seven women (fluid group). Intravenous infusions of oxytocin in 5% glucose were given to 12 women (oxytocin group). Thirty women delivered their babies without infusion (nofluid group). Blood and urine samples were collected at arrival, at early stage 1, at early stage 2, and at aftercare, and 9, 15, and 27 h postpartum. Plasma osmolality, sodium, cystatin C, vasopressin, oxytocin, urine flow, urine osmolality, and urine sodium were measured. **Results:** The oxytocin group had significantly lower plasma osmolality than the nofluid group before parturition, and they had lower plasma sodium concentration at early stage 1 and 2. Plasma vasopressin concentration was low and did not differ between groups or before and after parturition. Water diuresis developed postpartum in all groups. The cystatin C concentration decreased significantly after parturition in the oxytocin and nofluid groups. **Conclusions:** The vasopressin levels were suppressed during parturition irrespective of the P-osmolality and the nongravid regulation of water balance had not returned within 27 h postpartum.

IMPACT OF MODE OF DELIVERY, BMI AND WEIGH GAIN OVER PREGNANCY IN MATERNAL GUT MICROBIOME AT BIRTH TIME

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Introduction: Microbial colonization develops in parallel with the infant immune system maturation. Emerging evidence suggests that microbial contact begins already in the utero. Maternal microbiome constitutes the first inoculum for neonatal microbiota, although perinatal and genetic factors affecting the mother-infant microbial transference are still uncovered. Objective: Our objective was to characterize the impact of the delivery mode and other maternal parameters on the meconium and mother intestinal microbiome at delivery time. Methods: Maternal stool samples (n=53 mothers) were collected at the birth time. Microbiome composition was analyzed by 16S rRNA gene sequencing. Results: Significant differences in maternal gut microbiota between vaginal delivery and cesarean section (p=0.002) at OUT level were observed in mother stool samples collected at the birth time. Bacterial genera including *Fingoldia* (p0.0001), *Peptoniphilus* (p=0.005) and *Peptococcus* (p=0.007) groups were significantly more represented in maternal stool in C-section deliveries. Regarding the maternal parameters, higher *Prevotella* relative abundance was associated with weight gain over pregnancy in the normal weight woman (p= 0.055) but not in the overweight woman (p=0.12). Moreover, *Bacteroides* genus was negatively correlated with BMI (p=0.064). Conclusions: Maternal gut microbiota at the delivery time is affected by the mode of delivery and other parameters, including the pre-pregnancy BMI and weight gain during the pregnancy. Our study suggests these perinatal factors are influencing maternal microbiota and that may have an influence in the microbial colonization of the newborn.

PREGNANCY AND DELIVERY AMONG ADOLESCENTS

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Objective: To evaluate the obstetric and neonatal outcomes of teenage pregnancy in the region of Chania, Crete. Methods: We reviewed obstetric and perinatal outcomes of teenage nulliparous pregnant women with singleton pregnancies aged 14 to 19 years, delivered at General Hospital of Chania. Results: During the study period there were 7.155 deliveries, 226 by teenage women aged 14 to 19 years (3.16%) and comprised the study group. There were no significant differences in the number of deliveries between 32–36 weeks (15% vs 10%), polyhydramnios (3% vs 1%), gestational hypertension (13% vs 8%) and preeclampsia (8% vs 6%) between the two groups. When compared with older women, the proportion of very preterm deliveries (7% vs 3%), preterm premature rupture of membrane (19% vs 11%), oligohydramnios (6% vs 1%) and anemia (58% vs 44%) were significantly higher in teenage women. The proportion of cesarean deliveries was significantly higher in older women compared to teenagers (20% vs 10%). The proportion of very low birth weight (1.500g) born to teenage women was 13-times that of older women (3.9% vs. 0.3%). Because of this, teenage women had significantly lighter babies (2.750±690 vs 2.890±480) and more babies were admitted to NICU (8% vs. 5%), but this difference did not reach statistical significance. The two groups had similar proportion of congenital malformations (3.3%). Conclusion: The major risk associated with teenage pregnancies in our hospital was confined to preterm labor and low birth weight, but these were not associated with an adverse neonatal outcome.

Long Term Consequences

MATERNAL HYPERTENSIVE DISORDERS OF PREGNANCY AND THE RISK OF LONG-TERM PEDIATRIC NEOPLASTIC MORBIDITY OF THE OFFSPRING

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Objective: To determine whether maternal hypertensive disorders of pregnancy (HDP) influence the risk of long-term neoplastic morbidity of the offspring. **Study design:** A population-based cohort analysis was performed including all deliveries occurring during 1991-2013 at a single tertiary hospital. A comparison was performed between singletons exposed and unexposed to HDP. Multiple gestations, fetuses with congenital malformations, lack of prenatal care and perinatal deaths were excluded. Pediatric hospitalizations of the offspring up to the age of 18 years, involving neoplastic morbidity were evaluated. A Kaplan-Meier survival curve was used to compare cumulative morbidity incidence. A Cox regression model was used to control for confounders. **Results:** During the study period 238,622 deliveries met the inclusion criteria; 5.1% of which were deliveries with maternal HDP (n=12,051) and 94.9% (n=226,571) composed the comparison group. Total hospitalizations of the offspring involving neoplastic morbidity were not significantly different between the two groups (0.69% vs 0.62% respectively, $p=0.341$). The incidences of the different neoplastic types evaluated (e.g. head and neck, bone, kidney, brain, lymphoma, leukemia, benign neoplasms, etc.) was found to be comparable as well. The survival curve demonstrated similar cumulative incidences of neoplastic morbidity over time (log rank $p=0.972$). Using a Cox hazards model while controlling for maternal age, gestational age, and maternal diabetes, maternal HDP were not shown to be independently associated with long-term neoplastic morbidity of the offspring (adjusted HR=0.925, 95% CI 0.739-1.157, $p=0.495$). **Conclusion:** Maternal HDP do not appear to be a significant risk factor for long-term pediatric neoplastic morbidity of the offspring.

CARDIAC REMODELING IN ASSISTED REPRODUCTIVE TECHNOLOGIES: A FOLLOW-UP STUDY FROM FETAL LIFE TO CHILDHOOD

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Background. Offspring from assisted reproductive technologies (ART) associate increased long-term cardiovascular risk. Our aim was to assess the impact of ART on offspring' cardiovascular system from fetal life to childhood. **Methods.** A prospective cohort study in singletons including 80 pregnancies conceived by ART and 80 spontaneously conceived (SC). Comprehensive echocardiography was performed in the third trimester of pregnancy and postnatally (3 years of age). **Results.** As compared to SC, ART fetuses showed more globular ventricles (right ventricular sphericity index (RVSI): SC mean 1.7 (SD 0.33) vs. ART 1.4 (0.21), $p0.001$), thicker myocardial walls, larger atria (right atrial area: SC 1.47cm² (SD0.35) vs. ART 1.62cm² (0.35), $p 0.004$) and signs

of systolic (tricuspid annular plane systolic excursion (TAPSE): SC 6.6mm (0.9) vs. ART 5.6mm (0.8), p0.001) and diastolic (isovolumic relaxation time (IRT): SC 47ms (7.5) vs. ART 51ms (8.2), p0.001) dysfunction. Most cardiac changes persisted postnatally with ART children showing globular ventricles (RVSI: SC 1.8 (0.5) vs. ART 1.6 (0.2), p0.001), larger atria (SC 4.9 cm² (0.9) vs. ART 5.5 cm² (0.9), p0.001) and dysfunction (TAPSE: SC 18mm (2) vs. ART 16mm (3), p0.001; IRT: SC 68ms (12) vs. ART 79ms (SD), p0.001). ART children also presented increased systolic blood pressure (SC 90 mmHg (6) vs. ART 94 mmHg (5), p0.003) and carotid intima-media thickness (SC 0.52µm (0.14) vs. ART 0.60µm (0.16), p0.001). Conclusions. Fetuses and children conceived by ART manifest cardiovascular remodeling and dysfunction opening opportunities for early detection and potential intervention to improve their long-term cardiovascular health.

PREVENTION OF TYPE 2 DIABETES IN WOMEN WITH A HISTORY OF GDM: A LIFESTYLE INTERVENTION PROGRAM

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Background: Healthy lifestyle habits are modifiable factors to prevent or delay the development of type 2 diabetes (T2DM). The FINDRISC is a simple, fast, inexpensive tool to identify individuals at high risk for T2DM. Aim: Verify whether the risk to develop T2DM, assessed by FINDRISC questionnaire, should be reduced by a 6-month lifestyle intervention among women with a history of GDM. Methods: Among 255 females with a history of GDM, 88 non-pregnant Caucasian women were recalled. Every three months, they received an individual counselling session about healthy diet, physical activity, diabetes and risk factors, maintenance of a healthy lifestyle. At every scheduled visit, anthropometric parameters were assessed and FINDRISC questionnaire was administered. The study was approved by local Ethics Committee. Results: 71.5% of women had family history of DM2, 5.7% used blood pressure medications. All the modifiable factors improved after educational intervention. BMI (baseline vs 3-months vs 6-months: 26.7±5 vs 26±5 vs 25.8±6 Kg/m²) and waist circumference (87±12 vs 85±12 vs 84.5 ±12 cm) decreased; physical activity (12.2% vs 28.6% vs 51%) and daily consumption of vegetables and fruits (39.7% vs 57.1% vs 59.2%) improved. The FINDRISC score was significantly reduced (49.9% vs 38.2% vs 36.1% ; p0.05), with a mean change – 2.18 points from baseline. Conclusions: lifestyle intervention programs may have a significant effect in people with high risk to develop diabetes. Action should be taken to encourage women with GDM in order to allow the prevention and/or early detection of T2DM in Italy.

IS IT WORTHWHILE TO WORK ON THE LIFESTYLE OF WOMEN WITH GESTATIONAL DIABETES?

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Nowadays Gestational diabetes (GDM) affects many pregnancies and causes problems in a high percentage of them and, if not properly diagnosed and treated, poses a risk for both the mother and the unborn child. It is therefore useful a proper diabetes management that enhances compliance in women patients, entailing an adjustment to a new *lifestyle* in a short time, and the will to maintain it in the future. Since 2000 we have activated a multi-professional team taking care of patients. In the last years, building on the twenty-year experience gained by the clinic so far, this team, supported by scientific literature, has tried to consider the lifestyle of its women patients, and consequently has started to think of feasible educational initiatives to support the acquired knowledge and the team core

beliefs. Therefore, since 2013, *Therapeutic Education* has been developed, thanks to the self-production of materials (educational and informative), and expanded, scheduling a periodic meeting of a psycho-educational group. The data analysis that followed has brought to light a significant and amazing increase of women patients adhering to the follow-up (more than 80%); this could be viewed as a sign of greater awareness and its likely positive effect in terms of health. The excellent performance achieved leads us today to work on new projects that aim to encourage and motivate our women patients to maintain a healthy lifestyle for themselves and for their children (e.g.: one-year-old visit, “Conversation Map” sessions, etc.).

LONG-TERM EFFECTS OF FETAL EXPOSURE TO ORAL ANTIDIABETIC DRUGS: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS.

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BACKGROUND Despite the fact that long-term effects on offspring are still unknown, various international guidelines advise oral anti-diabetic drugs (OADs) to treat gestational diabetes (GDM). **METHODS** This systematic review summarizes evidence of randomized controlled trials (RCTs) reporting on long-term effects of fetal exposure to OADs. A literature search was performed in MEDLINE, EMBASE and CENTRAL from inception to 02-May-2016. Two independent researchers extracted and selected data. The Cochrane Collaboration's tool was used to assess risk of bias and methodological quality. **RESULTS** Eight studies were eligible, comprising 790 infants, aged 1-8 years, of mothers who were randomized to either metformin or insulin/placebo during pregnancy. Treatment indication was GDM (6 studies) or polycystic ovary syndrome. Meta-analysis showed that metformin was associated with heavier offspring (0.48kg CI[0.23-0.72];p0.001) at age 1-2 with similar height. Larger mid-upper arm circumferences and biceps skinfolds were reported at age 2. Effects were small and variable between studies. A small study (N=25) reported increased fasting glucose but lower LDL cholesterol at age 8. No differences were reported for body composition, blood pressure, social-, motor- or neurodevelopmental outcomes and testicular size. **DISCUSSION** Metformin appears to increase offspring weight, mid-upper arm circumference and fasting glucose, but lower LDL cholesterol in childhood. Trials studying OADs in pregnancy should consider long-term offspring outcomes to better inform patients and health care providers on the preferred therapeutic drug for women with GDM.

PROGRAMMING OF THE DEVELOPING HEART BY MATERNAL DIABETES

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Despite improved obstetric care and better management of maternal hyperglycemia over the last few decades, miscarriage and congenital abnormality rates still remain several-fold higher in pregnancies complicated by diabetes than in the healthy population. Besides direct teratogenicity, the maternal diabetic environment plays a somewhat important role in predisposing the offspring to a number of chronic diseases later in life, indicating a role for in utero or early post-natal influences on the developing child. This phenomenon is also termed “fetal”, “intrauterine” or “developmental” programming. However, the precise mechanisms for underlying penetrance and disease predisposition remain poorly understood. Previously, we have shown that a global partial deficiency of HIF-1 α increases the incidence of heart malformations and embryonic lethality under maternal diabetes conditions. We have hypothesized that HIF-1 α regulates embryonic responses to maternal diabetes, and that HIF-1 α deregulation may also influence the increased risk for diabetic cardiomyopathy in maternal diabetes-exposed offspring. Echocardiographic analysis showed that the main parameter of the systolic function of the left ventricle, fractional shortening, was significantly decreased in diabetes-exposed offspring with HIF-1 α deficiency, indicating dysfunction in heart muscular contractility. Using RNAseq, we identified that 71% of differentially expressed genes in diabetes-exposed HIF-1 α deficient offspring are associated with heart dysfunction. We also detected a large number of affected genes, encoding proteins involved in metabolic processes (34%) and embryonic development (27%). These results show molecular changes in metabolism and fetal gene reprogramming in the left ventricle, indicating changes, which are associated with failing heart reprogramming.

ASSISTED REPRODUCTION, DIABETES AND PREGNANCY OUTCOME IN ONE-CHILD MOTHERS: A POPULATION BASED COHORT STUDY

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Introduction: Studies found increased cardiovascular mortality among women with only one child. Our previous study found higher number of diabetes and assisted reproductive treatment (ART) among one-child mothers in a small sample. The aim was to estimate the risk of diabetes and ART in large population-based sample. Adverse pregnancy outcomes in first pregnancy were evaluated as potential reason for family size limitation. **Material and methods:** Population-based cohort study of 1 110 204 women with singletons (1967-2014) was conducted using data from the Medical Birth Registry of Norway. Mothers were linked to all their pregnancies using the unique personal identification number. Odds ratio (OR) for diabetes, ART and adverse pregnancy outcomes in one-child mothers was calculated compared to pregnancies in mothers with 2 or more births (first vs. first) using logistic regression. Adjustments included maternal age at first delivery, education and year of birth. We excluded women with history of hypertension and diabetes. **Results:** The ORs for diabetes and ART were 1.3 (95% CI: 1.2-1.4) and 1.5 (95% CI: 1.5-1.6), respectively, for one-child mothers compared to women with two or more children. One-child mothers showed 1.3-fold increase in risk of low birth weight (95% CI: 1.2-1.3). Moderate or no risk increase was found for remaining pregnancy outcomes. **Conclusion:** We have confirmed our previous finding of increased risk of diabetes and ART among one-child mothers in population-based sample, possibly implicating metabolic impairments. One-child mothers had no to moderately increased risk of adverse pregnancy outcome compared to mothers with two or more children

EFFECT OF INSR/FOXO1 ON THE EXPRESSION OF POMC IN THE BRAIN OF THE OFFSPRING OF INTRAHEPATIC CHOLESTASIS OF PREGNANCY RATS.

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To study the effect of InsR/FoxO1 on the expression of POMC in the brain of the offspring of intrahepatic cholestasis of pregnancy rats. **Methods:** 40 clean SD pregnant rats were selected and divided into two groups at random. 20 in every group. Since the 13th day of pregnancy, Control group was injected subcutaneously with refined vegetable oil 2.0ml·kg·d⁻¹, ICP group was injected subcutaneously with the 17- α -ethynylestradio(EE) 1.0mg·kg·d⁻¹. 20 female Offspring in Both ICP group and control group were selected at random and feed to six months.. At the 24 weeks of age ,offspring underwent a glucose tolerance test. All rats were killed at the six months. The mRNA of InsR、 FoxO1 and pomc were examined by real –time PCR and westblot. The expression of pomc in brain also examined by immunohistochemistry at 6 months offspring. **Result:** The glucose values of femalet 0min,15min,30min, 60min, respectively)in ICP group were higher than that of control group offspring at 0min,15min,30min, 60min (P 0.05). The mRNA expression o InsR、 FoxO1 and POMC in ICP group offspringwere different with control offspringat six months, (P 0.05). The positive cells of POMC in ICP group were little than that control group. . **Conclusion:** Bile acid levers is higher in ICP The bad intrauterine environment may be a major contributor to Insulin resistance and POMC

7-YEAR RESULTS OF "ZOET ZWANGER" (SWEET PREGNANCY) PROJECT: A REMINDER SYSTEM FOR WOMEN WITH A HISTORY OF GESTATIONAL DIABETES IN FLANDERS, BELGIUM

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Background & aims: Women with a history of gestational diabetes (GDM) are at increased risk to develop type 2 diabetes. Long-term follow-up of these women is often lacking in daily practice. Important opportunities for diabetes prevention are being missed. The "Zoet Zwanger" (sweet pregnancy) project was launched in October 2009 in Flanders, Belgium to promote yearly follow-up of glycemic status and a healthy lifestyle in women with previous GDM. Materials & Methods: Women with GDM are voluntarily invited to register in the "Zoet Zwanger" reminder system. Registrants receive yearly reminders to have a fasting plasma glucose test (FPG) in primary care to early detect (pre)diabetes. Kaplan-Meier analyzes were performed to estimate the cumulative risk of (pre)diabetes based on self-reporting of the FPG by registrants. Results: Until October 2016, 7.629 women registered in the reminder system. The yearly response rate varied from 74,4% after the first year to 61,8% after the fifth year. Of all responders 67,4% reported a screening test after the first year and 71,9% after the fifth year. The cumulative risk after 6 years for diabetes and impaired fasting glucose is respectively 7,3% (CI 6,0%-8,8%) and 27,4% (23,9%-31,0%). Conclusion: This project offers a clear practice framework to promote early detection of diabetes in women with previous GDM. Nearly 35% of women developed (pre)diabetes within 6 years based on the FPG. This is an opportunity to

implement lifestyle changes early in the course of diabetes, in order to stop disease progression and reduces costly complications.

Multiple Pregnancy

ASYNCHRONIC TWIN PREGNANCY BIRTH IN TEN DAYS. CASE REPORT.

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INTRODUCTION: Asynchronous twin birth is an exceptional situation. There is no current evidence that allows us to generate standardized management protocols. **CLINICAL CASE:** Patient M.C.L., 36 years old, Multiparous of 2, without morbidities, attending a dichorionic-diamniotic twin pregnancy of 22 + 6 weeks. Consulted in a hospital of low complexity, showing active labor, resulting in expulsion of the first twin (Stillborn) and frustrated placenta delivery. Posterior ultrasound: twin II with preserved vitality, normal placenta and normal AFI, FWE 553 grs. Placenta of twin I in situ covering internal os, without image of massive detachment. Cervicometry of 53 mms. It's transferred to Hospital de La Serena, IV region, Chile. Active management begins with pulmonary maturation, broad spectrum antibiotic coverage and neuroprotection. At 10 days of admission (24 + 2 weeks), the patient started with symptoms of premature placental abruption; Emergency cesarean section is indicated. Intraoperative findings: blood-liquid, abruptio placentae of Feto I and II, approximately 80% and 30%, respectively. Surgery without incident. NB alive with weight of 640 grams, Apgar 2-7. Ph 7.05 and BE - 5.4. Evolves in a torpid way, with cardiorespiratory arrest at 60 hours of life that despite active management is not reversed, dying within a few hours. Mother evolves with physiological puerperium, with no signs of infection or new hospitalization. **DISCUSSION:** expectant management after delivery of a first twin is possible and could increase the chances of life of twin II until its viability, considering therapeutic medical measures and narrow maternal - fetal control.

DIFFERENTIAL EFFECT ON MYOCARDIAL PERFORMANCE INDEX IN DONOR AND RECIPIENTS OF TWIN-TO-TWIN TRANSFUSION SYNDROME

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Objective: To evaluate myocardial performance index (MPI) in fetuses with twin-to-twin transfusion syndrome (TTTS). **Methods:** Fifty-one fetal pairs with TTTS evaluated within 24 hours before and 72 hours after the procedure and 47 gestational age-matched normal monochorionic twin pairs were included. Left ventricular isovolumetric contraction time (ICT), ejection time (ET), and isovolumetric relaxation time (IRT) were measured using pulsed wave conventional Doppler for the calculation of MPI. **Results:** Recipient twins showed prolonged ICT (recipients 46 ± 12 vs. donors 31 ± 8 vs. controls 30 ± 5 ms; $p < 0.001$), IRT (recipients 51 ± 9 vs. donors 43 ± 8 vs. controls 43 ± 5 ms; $p < 0.001$), and MPI (recipients 0.57 ± 0.12 vs. donors 0.47 ± 0.09 vs. controls 0.44 ± 0.05 ; $p < 0.001$) than donors and controls. Donor twins showed shorter ET than recipients and controls (donors 157 ± 12 vs. recipients 169 ± 10 vs. controls 168 ± 10 ms; $p < 0.001$) and prolonged MPI. MPI changes were observed in all TTTS stages in both recipients and donors before surgery. After surgery, ET improved in donors at all severity stages and IRT in recipients at early stages. **Conclusion:** Both donor and recipient twins

presented signs of cardiac dysfunction in all TTTS stages. MPI seems a very sensitive parameter for early fetal cardiac impairment in TTTS.

A COMPARISON OF MATERNAL AND PERINATAL OUTCOME BETWEEN IN VITRO FERTILIZATION AND SPONTANEOUS DICHORIONIC-DIAMNIOTIC TWIN PREGNANCIES

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Objective: Twin pregnancies are known to be associated with increased maternal and perinatal complications. It is still in controversial whether the maternal and fetal complication rate is higher in in vitro fertilization (IVF) twin pregnancies than in spontaneous twin pregnancies. We aimed to compare the maternal and neonatal outcome according to mode of conception. Study design: A retrospective study of all consecutive dichorionic-diamniotic twin pregnancies delivered in our institution between 01/09-05/15 was performed. Maternal and fetal characteristics and pregnancy outcome of IVF twin pregnancies was compared to spontaneous pregnancies. Results: A total of 708 (449 IVF and 259 spontaneous) twin pregnancies were included in this study. Women in the IVF group were 2 years older (32.0 ± 5.5 vs 30.0 ± 4.8 $p < 0.001$) and more frequently nulliparous (54.7% vs 32.4% $p < 0.001$). The rate of pregnancy induced hypertension (PIH)/preeclampsia (PET) was three times higher in the IVF group than in the spontaneous group (8.4% vs 2.6% $p = 0.002$). The rate of preterm births, and cesarean sections were higher in the IVF group (59% vs. 47.4% $p = 0.002$ and 73.9% vs. 61.3% $p < 0.001$ respectively). These results were confirmed by multivariate analysis after adjustment for age, parity, PIH/PET and smoking. The neonatal outcome was similar in both groups, except for a lower mean newborn birth-weight in the IVF group. Conclusion: Women with IVF twins are at a significantly higher risk of having preterm births and cesarean section. There was no significant adverse effect on neonatal outcome except for a lower mean newborn birth weight.

ASSOCIATION BETWEEN GESTATIONAL WEIGHT GAIN AND MATERNAL COMPLICATIONS/NEONATAL BIRTH WEIGHT IN TWIN PREGNANCIES

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Objective: To determine if an inappropriate rate of gestational weight gain (GWG) in twin pregnancies is associated with adverse obstetric outcomes. Methods: A multicenter retrospective study was conducted in 39 medical institutions in mainland China. A total of 687 women with pre-pregnancy BMI (PPBMI) $\geq 18.5 \text{ kg/m}^2$, confirmed twin pregnancies, gestational age at delivery ≥ 28 weeks and live births without malformation between January 1, 2011 and December 31, 2011, were included in the analysis. Based on their PPBMI, the subjects were classified as normal weight ($18.5\text{-}24.9 \text{ kg/m}^2$) or overweight/obese ($\geq 25.0 \text{ kg/m}^2$). Information on GWG, maternal complications, and neonatal birth weight were collected. GWG was classified as normal, insufficient and excessive based on the Institute of Medicine guidelines. Association between PPBMI and GWG, maternal complications and neonatal weight was assessed. Results: Approximately 44.1% of the women was identified to have insufficient GWG, 43.7% with normal GWG and 12.2% with excessive GWG. With the increasing GWG, the incidence of hypertensive disorders of pregnancy (HDP) increased ($p < 0.05$), while the incidence of small for gestational age (SGA) infants decreased ($p < 0.01$). In the normal PPBMI subgroup, women with insufficient GWG showed higher incidence of SGA [OR=2.0, 95% CI (1.4-2.9)] compared to those with normal GWG. In contrast, in the overweight/obese subgroup, the incidence of HDP was significantly lower in women with insufficient GWG than in those with normal GWG [OR=0.2, 95% CI (0.1-0.6)]. Conclusion: In women with twin pregnancies, insufficient GWG overall was

associated with increased risk of SGA but decreased risk of HDP. Additionally, the association of GWG with SGA or HDP seems to depend on the PPBMI.

INTERTWIN DELIVERY INTERVAL (ITID) AND NEONATAL OUTCOMES: A RETROSPECTIVE STUDY.

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OBJECTIVE To evaluate to association between ITID and neonatal outcomes of the second twin.
METHODS We retrospectively reviewed data charts of women with twin pregnancy who vaginally delivered first twin in our clinic between Jan2000 and Dec2016. We divided the patients in two groups according to ITDI shorter or longer than 15', after we compared neonatal outcomes of the second twin between the two groups.
RESULTS In the study period 92 women were included, 52 had an ITDI 15' (56%) and 40 (44%) \geq 15'. Second twins with a longer ITDI had an increase number of arterial cord pH
CONCLUSION An ITDI longer than 15` is frequently associated with the need to perform a CS on the second twin and therefore with a worse umbilical artery pH of the second twin. An increase standard of care is required when ITDI exceeds 15'.

Obesity in Pregnancy

PREDICTIVE FACTORS FOR FETAL MACROSOMIA: THE IMPORTANCE OF MATERNAL WEIGHT.

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INTRODUCTION: The aim of gestational diabetes mellitus (GDM) screening is to identify patients at risk for having a macrosomic baby. However, in our center only 6,9% of these babies were born from mothers diagnosed of GDM. Therefore, other risk factors must be implicated in development of excessive weight at birth. Our objective was to identify independent risk factors for macrosomia in our population. **METHODS:** Retrospective analysis of medical files of all pregnant women attending Hospital Universitari General de Catalunya during the year 2015. A total of 2123 cases of single pregnancies at term were selected. We studied relationship of eight variables with the outcome of having a macrosomic baby: GDM, obesity, excessive maternal weight gain(15kg), postdate pregnancy, advanced maternal age, ethnicity and smoking. Logistic regression was carried out to evaluate independent risk factors. R software (R core Team. Vienna 2016) was used. **RESULTS:** Only three factors remained significant after adjustment: obesity (OR 1,94; 95% CI 1,19-3,61), postdates (OR 2,85; 95% CI 1,92-4,18) and weight gain (OR 1,83; 95% CI 1,30-2,57). The AUC was 0,65 and accuracy was 51%. **DISCUSSION:** Obesity and excessive maternal weight gain had more impact on fetal macrosomia than GDM. The new FIGO criteria should be introduced in order to improve identification of patients at risk. The model, however has a low accuracy, suggesting that other factors such as familiar history of diabetes should be studied.

BMI AND PHYSICAL ACTIVITY DURING PREGNANCY: A COHORT STUDY IN DENMARK

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Introduction Studies indicate that physical activity is preventive of pregnancy related disorders. Still, literature describing physical activity during pregnancy is sparse. Objective To explore physical activity among pregnant women according to their pre-pregnant BMI. Methods This population based cohort study included 400 singleton pregnant women at Aarhus University Hospital, Denmark (2010-2015). In each trimester, physical activity was objectively recorded using *Sensewear Armband Pro3* during four consecutive days. Measurements included daily metabolic equivalent task level (MET) and number of steps. Women with a pre-pregnant BMI 25, 25-30 and 30 were classified as normal weight, overweight and obese, respectively. We calculated means of daily MET level and number of steps. Using one-way Anova and Kruskal Wallis, we tested for differences in means across BMI groups. Results In each trimester, mean MET levels decreased with increasing BMI. Differences in mean MET levels across BMI groups were significant in all trimesters (MET p0.000). Differences in mean steps across BMI groups were not significant in any trimesters (steps p0.05). Conclusion Physical activity measured by MET, but not steps, was significantly higher among pregnant women of normal pre-pregnancy weight, during all trimesters, compared to those who were overweight or obese.

THE INCREASE IN INSULIN LEVELS DURING PREGNANCY IS INDEPENDENTLY RELATED TO MATERNAL BMI IN EARLY PREGNANCY, GESTATIONAL WEIGHT GAIN AND FAT ACCUMULATION

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Background Pregnancy is characterized by physiological adaptations in glucose metabolism to ensure fetal growth. Maternal BMI influences these metabolic changes and gestational weight gain and fat accumulation may add to these. We investigated the associations between maternal BMI, changes in fasting glucose (Δgluc) and insulin (Δins), gestational weight gain (GWG) and fat accumulation ($\Delta\text{fat}\%$). Based on this we hypothesized that maternal BMI, GWG and fat accumulation augment the increase in fasting insulin during pregnancy. Methods This study includes 319 pregnant women from Oslo University Hospital and Drammen Hospital. Fasting glucose and insulin were measured in early pregnancy (week 14-16) and late pregnancy (week 36-38) and the difference between these were calculated. Bioimpedance weight (Tanitha) was used to estimate fat percentage. Measurements in early and late pregnancy were compared by paired samples t-tests. Correlation analyses and linear regression analyses were performed. Results Fasting glucose and insulin, weight and fat % increased significantly during pregnancy. Maternal BMI was correlated with Δins ($r=0.27$, $p0.001$), GWG ($r=-0.22$, $p0.001$) and $\Delta\text{fat}\%$ ($r=-0.53$, $p0.001$). In multiple linear regression both BMI (B 4.6, 95% CI 3.5-5.6, $p0.001$), GWG (B 2.1, 95% CI 0.7-3.5, $p0.05$) and $\Delta\text{fat}\%$ (B 1.7, 95 % CI 0.3-3.1, $p0.05$) were independent determinants of Δins . Conclusion The gestational increase in plasma insulin during pregnancy is augmented independently by high maternal BMI and further enhanced by both GWG and fat accumulation.

PLACENTAL FATTY ACID OXIDATION IN OBESE WOMEN

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Objective. To evaluate placental lipid metabolism in lean and obese women. **Material and Methods.** Prospective case-control study about placental metabolism in lean (BMI25, n=10) and obese women (BMI30, n=10), according to pregestational Body Mass Index (BMI). Placentas were obtained after elective cesarean sections (gestational age 38.3 ± 1.0 and 38.3 ± 0.8 weeks, respectively). Placental weights and mitochondrial fatty acid oxidation (FAO) were measured. Comparisons between two groups were performed by using the Student t test. The relationships between variables were analyzed using Pearson's correlation coefficient. **Results.** There were significant differences when comparing FAO levels between lean and obese group (3.94 ± 1.17 Vs 5.15 ± 0.83 nmol/mg tissue/h; $p=0.02$, respectively). Significant correlations were found between FAO levels and pregestational weight and BMI ($r=0.58$, $p=0.01$ and $r=0.60$, $p=0.01$). Significant correlations between FAO levels and final pregnancy weight and BMI were also found ($r=0.53$, $p=0.02$ and $r=0.55$, $p=0.01$). **Conclusions.** Obese women showed higher placental fatty acid oxidation rates. Pregestational BMI may influence placental lipid metabolism.

SELF-WEIGHING THROUGH PREGNANCY: A STUDY ON GESTATIONAL WEIGHT GAIN AMONG SMART SCALE USERS

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Background: In 2009, the Institute of Medicine published revised gestational weight gain (GWG) guidelines based on risks for mothers and newborns. It is known today that frequent self-weighing is correlated with successful weight management. However, little is known about its association with GWG, which is what the present work aims at assessing.

Methods: Weight time series of 300 anonymous Withings smart scale female users who delivered a single infant were analyzed. GWG was computed as the last pregnancy weight (last weight measurement during the 3 weeks preceding delivery) minus the pre-pregnancy weight (most recent weight measurement during pregnancy weeks 0, 1, and the 12 weeks preceding the last menstrual period). All women have a declared height. Their GWG was compared to the IOM guidelines according to their pre-pregnancy body mass index. **Results:** The 300 women self-weighed on average during 30.7 weeks of pregnancy (average pregnancy duration of 39 weeks). 41% of them experienced a GWG above the guidelines. Women who weighed themselves in at least 2 out of 3 weeks were 17% less to experience excessive GWG than women who weighed themselves in less than 2 out of 3 weeks (37% vs. 54%, $p = 0.015$). Their GWG was 3.3 kg lower (12.8 vs. 16.1 kg, $p = 0.001$). **Conclusion:** Frequent self-weighing appears to be associated with a lower incidence of excessive GWG. Frequent self-weighing is a strongly behavioral element that could be part of doctor recommendations during pregnancy for women at risk of excessive GWG.

EATING BEHAVIORS THROUGH PREGNANCY: A STUDY ON GESTATIONAL WEIGHT GAIN AMONG SMART SCALE USERS

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Background: In 2009, the Institute of Medicine published revised gestational weight gain (GWG) guidelines based on risks for mothers and newborns. The present work aims at assessing the association between eating habits during pregnancy and GWG. **Methods:** Weight time series of 300 anonymous Withings smart scale female users who delivered a single infant were analyzed. Weight data measured by the scales were crossed with declarative eating habits data, collected from a questionnaire filled in by the women through the Withings mobile application. **Results:** 41% of the women experienced a GWG above the guidelines. Women declaring to have eaten more than usual during pregnancy were 11% more to have excessive GWG (45% vs. 34%, $p=0.01$). It seems that it is the 1st-trimester diet that played a role in GWG, as no statistical difference was found for women who ate more than usual during 2nd and 3rd trimesters. Women who ate more during the 1st trimester were 23% more to have excessive GWG (59% vs. 36%, $p=0.001$). Besides quantity, quality of food intake played a role: women declaring to have improved their diet during pregnancy were 22% less to experience excessive GWG (33% vs. 55%, $p=0.003$). **Conclusion:** Not increasing the quantity of food intake before the beginning of the 2nd trimester, and improving the eating diet during pregnancy appear to be associated with a lower incidence of excessive GWG. All these are strongly behavioral elements that could be part of the doctor recommendations during pregnancy for women at risk of excessive GWG.

GESTATIONAL DIABETES MELLITUS, OVERWEIGHT AND OBESITY.

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Introduction: Overweight and obese pregnant women are at increased risk for maternal and perinatal complications. The prevalence of gestational diabetes mellitus (GDM) is significantly higher in overweight/obese (O/OW) women than in the general obstetrical population, and the risk increases with increasing maternal weight and body mass index (BMI). **Material and Methods:** We performed a retrospective study in our maternity in the year 2014, where 621 pregnant women were selected. We divided the sample into two groups: BMI $<25\text{kg/m}^2$ (control group - CG) vs. BMI $\geq 25\text{kg/m}^2$ (O/OW group). The relation between gestational weight gain (GWG), BMI and GDM, was evaluated. **Results:** In our study, 44% were European, most were leucodermic, and the mean age was 30 years, and 48% had BMI $\geq 25\text{kg/m}^2$. In pregnant women with GDM, 65% were overweight and 34% were obese. The $\geq 25\text{kg/m}^2$ group had higher incidence of GDM: 18% vs. 7% in the CG. The mean BMI was 28 in GDM pregnancies vs. 25 in the non-GDM pregnancies. In 77 pregnant women with GDM, 71% had $\geq 25\text{kg/m}^2$, of which the majority was overweight. The OW women with GDM had mean GWG in the 1st trimester of 3kg vs. 0,33kg in the obese GDM group. And the majority of GDM was diagnosed in the 2nd trimester, and 30% was controlled with diet. In the drug controlled GDM group, 11% had $<25\text{kg/m}^2$ and 91% $\geq 25\text{kg/m}^2$. Of which 49% were obese and 43% were overweight. **Conclusion:** In our sample, we observed that higher BMI is a risk factor for the development of GDM and for the need to use antidiabetic therapy.

KNOWLEDGE ABOUT WEIGHT GAIN, EXERCISE AND NUTRITION DURING PREGNANCY: A CROSS-SECTIONAL STUDY

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Objective: The aim of the study was to verify knowledge of pregnant women regarding gestational weight gain (GWG), physical exercise (PE) and nutrition. **Methods:** A cross-sectional study was performed while women waiting for prenatal consultation. Were included women, over than 19 years old, with singleton and low risk pregnancy, and without contraindications for PE. They were applied a questionnaire about socio-demographic data, previous obstetric outcomes and knowledge about

healthy habits (HH) during pregnancy. After then, they received an educational guide with advice on HH during pregnancy and postpartum period. Results: 60 women were included, with average age 28.0 ± 6.23 years old, 85% were married and 68% were multiparous. The average body mass index before pregnancy was 25.4 ± 9.81 , mean years of education was 11.0 ± 3.8 , 54% had planned gestation and 58% were employed. Only 61% referred to receive any information about GWG during prenatal care and 61% knew how many pounds should gain during pregnancy. 85% do not think that they should "eat for two" and 99% know that PE practice has benefits for their body and is safe for her baby, but only 30% was doing physical exercises during pregnancy. Conclusion: Even knowing about HH during pregnancy, women need to be encouraged to practice PE during pregnancy and more informations about GWG are needed. Specific guidelines during prenatal care are extremely important to encourage women to have HH during pregnancy.

EVALUATION OF NUTRITIONAL STATUS AND BODY COMPOSITION IN WOMEN IN THE IMMEDIATE PUERPERIUM: PRELIMINARY DATA

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Objective: This study aims to evaluate nutritional status (NS) and body composition (BC) of women during puerperium. Methods: A cross-sectional study. A questionnaire on sociodemographic and obstetric data was applied from the first to third day after delivery. NS and BC were evaluated through body mass index (BMI), electrical bioimpedance analysis (BIA) and measurement of abdominal and hip circumference, skinfolds and sagittal abdominal distance. Results: 49 women were included, average age was 21.6 ± 4.6 , average schooling 12.5 ± 4.5 years, 56.2% non-white, 93.7% married, 77.0% multiparous. The average weight at the first prenatal visit was 69.7 ± 16.2 Kg and at the last visit was 79.2 ± 14.7 Kg. The pre-gestational BMI average was 27.4 ± 8.0 . The mean waist-hip ratio was 0.93 ± 0.06 , highest and lowest sagittal waist, were, respectively, 20.0 ± 7.2 cm and 17.7 ± 7.2 cm. A percentage of 28.7 ± 8.9 body fat was found according BIA, compatible to obesity. Skinfold measures of subscapular, supriliac and triceps regions were above normal and only bicipital remained normal. The difference between pre-gestational and immediate puerperium weight was 8.6 ± 5.9 kg. Conclusion: Most women began gestation overweight and immediately postpartum had criteria for obesity according to BIA and BMI and also waist-hip ratio was above normal. Appropriate strategies, with the introduction of healthy habits in pregnancy and also in the puerperium may be the key to women avoiding excessive weight gain and reduce risk of future diseases associated with obesity.

DIETARY PROFILE AMONG ADOLESCENTS IN EARLY PREGNANCY

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Background/Objective: High nutritional needs and inadequate diet can affect perinatal outcomes among adolescents. This study aims to know the dietary profile in early pregnancy among teens. Methods: Prospective cross-sectional study. Sociodemographic and reproductive data, 24 hours dietary recall, body mass index (BMI) and body fat percentage (%BF) measured by subcutaneous adiposity (SA) and bioelectrical impedance analysis (BIA) were collected before 20 weeks of gestational age. Results: 87 adolescents were included with average age 15 years old (± 1.4) and BMI 22.9 Kg/m^2 (± 4.2). Weight variation between pre-gestational and first prenatal visit was 1.7 Kg (± 4.4). The mean %BF was 31.9% (± 4.4) by SA and 28.7% (± 4.6) by BIA. The average energy consumption was 116.8% (± 281.2) of daily recommendation (1805.5 Kcal/day; ± 67.2). Carbohydrate and lipid were an excessive intake in 36.8% and 31% respectively. Iron and folate intake were below the recommended in 98.9%, and there supplementation were used respectively in 45% and 18%. Calcium intake was below the recommended in 94.3%. Protein and zinc consumption were negatively correlated with %BF

by both methods ($r=-0.3096$ and $r=-0.2363$). Conclusion: Pregnant adolescents present a eutrophic BMI with high %BF, which can be related with the high consumption of carbohydrate and lipid, and with the low consumption of protein. Pregnant adolescents also had low consumption of iron, folate and calcium, and then the supplementation of these micronutrients is mandatory during teenage pregnancy. These results show the importance of multidisciplinary prenatal care for pregnant adolescents, which may be the key to reducing adverse neonatal outcomes.

LABOR IN OVERWEIGHT AND OBESE PREGNANT WOMEN

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Introduction Obese pregnant women are at increased risk for maternal and perinatal complications, that are amplified with increasing maternal body mass index (BMI). Recommendations of Institute of Medicine (IOM) on gestational weight gain (GWG), optimize maternal and infant outcomes. The aim of our study was to evaluate the effect of GWG in overweight and obese women, on spontaneous labor, birth weight and caesarean rate. **Material and methods:** We performed a retrospective study of 282 pregnant women with $BMI \geq 25\text{kg/m}^2$ followed at our maternity. They were grouped by IOM recommendations on GWG as: low, adequate and high. **Results:** In this sample 77,5% of women were leucodermic, 34% obese and median age was 32 years. The GWG was high in 55,3%, adequate in 29,1% and low in 15,6%. Spontaneous labor occurred in 147 women and 21 were induced or had elective caesarean section after 41 weeks. The three groups were similar in general characteristics and obstetric complications, except on gestational diabetes, which was significantly higher in the low GWG group, probably resulting from the diabetic diet and surveillance. When compared GWG and spontaneous labor, the high gestational weight gain was not associated with prolonged pregnancy and didn't reduce the rate of spontaneous labor. The caesarean rate and newborn weight gain was similar in all groups. **Discussion and Conclusions:** Unlike other studies, in our sample, higher GWG did not delay spontaneous labor, nor was it associated with large weight newborn or higher caesarean rate.

PREGNANCY AFTER BARIATRIC SURGERY: TIME TO IMPROVE AWARENESS!

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Obesity and surgical-induced weight loss after bariatric surgery have an impact on pregnancy. We planned to document the awareness of women and health professionals about pregnancy after bariatric surgery.

Seventy-nine women aged 18 to 45 years underwent bariatric surgery (13 BIB, 27 LAGB, 27 Sleeve gastrectomy) at San Raffaele Scientific Institute from 01/02/2010 to 31/07/2016 and 67 of them completed a closed-answer questionnaire about awareness of pregnancy after bariatric surgery (response rate 84.8%). We enquired 37 accredited centers (4,817 women of childbearing age treated in 2013-2015) about the information on pregnancy after bariatric surgery provided to patients (response rate 29.7%).

Although women were well aware (73% of responders) that obesity affects fertility and conception, the majority ($\geq 85\%$) was unaware that obesity itself and bariatric surgery may have an impact on a pregnancy. Seventy-three percent of women reported receiving no information on the recommended waiting time to start a pregnancy after bariatric surgery and 85% were unaware of the need for nutritional counselling or nutritional supplements during pregnancy after bariatric surgery. The majority of centers reported to provide some counselling on pregnancy after bariatric surgery, although only one center distributed a leaflet on this topic to patients.

In Italy the impact of obesity and surgical-induced weight loss on pregnancies after bariatric surgery are poorly acknowledged by both women of childbearing age and health care teams. There is a need to increase awareness of women on pregnancy after bariatric surgery and to include this topic in training programs for health professionals.

BODY IMAGE AND RELATED FACTORS PREGNANT WOMEN

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Body image is a person's perception of the aesthetics or sexual attractiveness of their own body. Many women show a remarkable change in body experience during the pregnancy. In pregnancy, a woman's body undergoes rapid physical changes in many ways, but most notably in weight and shape. Body image may change as positively or negatively during the pregnancy. This descriptive study was carried out to determine status of perception of pregnant women regarding their body images during the pregnancy. The study was conducted with pregnant women who came to routine control and education in a pregnant polyclinic and pregnant school of a K hospital. Data were collected by "body sense scale" (BSS) and characteristics form. The data was analyzed percentage, mean, cronbach' Alpha, t-test for independent groups. It was found that no important relationships between total BSS scores of pregnant and their age, education status, working conditions, economic status, their husband's age, education ($p < 0.05$). It was also found that no relationships between BSS scores of pregnant and pre-pregnancy experience, lost child or abort, a planned or non-planned pregnancy ($p < 0.05$). It was found that an important relationship as statistically between total BSS scores of pregnant and their satisfaction of images in the scene, do not make any attempt to hide their pregnancy, positive perception of changing body images, have no sense of change while evaluating their bodies functionally ($p < 0.05$). Health professionals are usually regardless of the concept of body image in pregnancy. Body image is an important concept that should not be omitted. Body image must be considered in training, is temporary should be emphasized the changes and positive feelings of pregnancy should be supported. Key words: Pregnancy, pregnancy experience, body image, nurse

ATTAINMENT OF LATE-PREGNANCY GLYCEMIC CONTROL IN OBESE PREGNANCIES HAS DIFFERENTIAL LONG-TERM EFFECTS ON THE OUTCOMES OF MOTHERS AND THEIR CHILDREN – RESULTS FROM THE PROSPECTIVE PEACHES MOTHER-CHILD COHORT

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Background: We aimed to assess the unknown impact of late-pregnancy glycemic status, as indicated by high HbA_{1c} at delivery, in obese mothers with or without gestational diabetes on both maternal and offspring long-term outcomes. **Methods:** The Programming of Enhanced Adiposity Risk in Childhood-Early Screening (PEACHES) study (n=1671) comprises a cohort of obese mothers with trimester-specific information on gestational glucose metabolism (n=765). **Explanatory variables:** second-trimester GDM status and high maternal HbA_{1c} at delivery ($\geq 5.7\%$); **outcomes:** offspring birth weight, BMI z-scores at 4 years, maternal HbA_{1c} and oral glucose tolerance test 3 years postpartum; **reference:** obese GDM-negative mothers with low HbA_{1c} at delivery. **Increments (Δ)** were assessed in adjusted multivariate regression models. **Results:** Obese GDM-negative mothers with high HbA_{1c} at delivery had dysglycemia 3 years postpartum, including higher fasting glucose (Δ :4.7mg/dl, 95%CI:1.6,7.9) and HbA_{1c} (Δ :0.4%, 95%CI:0.3,0.5) than controls. Additionally, their offspring had higher birth weight (Δ :191.7g, 95%CI:0.97,286.4) and 4-year-BMI z-score (Δ :0.53, 95%CI:0.11,0.95). In contrast, obese GDM-positive mothers achieving low HbA_{1c} at delivery yielded child outcomes similar to control offspring (4-year-BMI z-score: Δ :0.08, 95%CI:-0.30,0.45), although not regarding their own long-term glucose metabolism (fasting: Δ :12.1mg/dl, 95%CI:1.3,22.8; 2h: Δ :12.1mg/dl, 95%CI:0.9,23.2). Nevertheless, their outcome was less severe than in obese GDM-positive mothers with high HbA_{1c} at delivery who had a 2-fold increased risk of developing type 2 diabetes/prediabetes (RR:2.00, 95%CI:1.03,3.88). **Conclusion:** Attainment of late-pregnancy glycemic control in obese pregnancies, irrespective of GDM status, reduces the risk of childhood overweight and partially that of long-term maternal dysglycemia. Obese mothers need intensified monitoring throughout their entire pregnancy.

CLINICIAN'S ATTITUDES TO THE INTRODUCTION OF ROUTINE WEIGHING IN PREGNANCY

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Excessive gestational weight gain poses significant short- and long-term health risks to both mother and baby. International guidelines increasingly recommend greater attention be paid to weight gain in pregnancy. A large Australian tertiary maternity hospital plans to facilitate the (re)introduction of routine weighing of all women at every antenatal visit. Beforehand we interviewed 44 maternity staff (doctors, midwives and dietitians) about barriers and enablers to routinely weighing pregnant women. While most staff supported routine weighing, various concerns were raised. Issues included access to resources and staff; the ability to provide appropriate counselling and evidence-based interventions; and the impact of weighing on patients and the therapeutic relationship. Implementation strategies will be tailored to the discrete professional groups and will address identified gaps in knowledge, resources, and clinician skills and confidence.

STAPLES AND DRESSING REMOVAL AFTER CESAREAN DELIVERY: DOES TIMING MATTER?

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Background: Rate of major wound complications following cesarean delivery (CD) ranges from 6-13%. There is no consensus regarding the optimal time to remove the dressing and staples. **Objective:** To determine the optimal timing of dressing and staple removal, based on wound healing assessed 6 weeks postpartum. **Study Design:** Prospective case-control time cluster trial. All women undergoing CD were eligible. Women were assigned to one of 5 clusters, each lasting 3-4 months. Cluster 1 received standard protocol and served as controls. During each period, timing of dressing and staple removal was changed. Six weeks postpartum wound healing was assessed by telephone interview. In a subset of patients, wound healing was assessed by a physician at the time of staple removal. **Results:** 1403 women were accrued; 920 completed the telephone questionnaire. A subset of 586 women underwent physician assessment at staple removal. No significant differences in wound healing were found: healing complication rate was 21% in the control group and 18-26% in clusters 2-5 ($p=0.49$). In all clusters, more healing complications were observed in women with BMI 35 vs. BMI ≤ 35 (28% vs. 19.3%, $p=0.016$), urgent vs. elective CD (24.1% vs. 17.9%; $p=0.013$), PPRM vs. intact membranes (26.5% vs. 19.4%, $p=0.016$), and women with chorioamnionitis at delivery vs. those without (39.3% vs. 20.4%, $p=0.001$).

Conclusions: Dressing and staple removal timing has no effect on wound healing following CD in low and high risk parturients. Any protocol can be adopted safely. However, BMI35, urgent CD, PPRM, and chorioamnionitis adversely impact scar recovery.

INSULIN RESISTANCE, GESTATIONAL WEIGHT GAIN AND INCIDENCE OF GESTATIONAL DIABETES IN OBESE NON-DIABETIC WOMEN RECEIVING METFORMIN

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Objectives: To investigate whether maternal insulin resistance measured at booking or at 28 weeks correlates with gestational weight gain (GWG) or the incidence of gestational diabetes (GDM) in obese non-diabetic women. **Methods:** This was a secondary analysis of non-diabetic obese (BMI 35kg/m^2) pregnant women who received either metformin or placebo in a double masked controlled trial assessing pregnancy outcomes (MOP trial). Fasting plasma glucose and insulin were measured at booking and again at 28 weeks in 384 women. Insulin resistance was calculated by the homeostasis model assessment of insulin resistance (HOMA-IR). **Results:** Women allocated to metformin or placebo were similar in baseline characteristics including HOMA-IR. At 28 weeks, median HOMA-IR was significantly lower in those women receiving metformin when compared to those receiving placebo (3.9 vs 4.6); p **Conclusions:** In obese non-diabetic pregnant women, those

developing GDM appear resistant to the insulin sensitising effects of metformin. The lower GWG associated with metformin does not seem to be attributable to changes in insulin resistance.

PRENATAL HUMAN MILK OLIGOSACCHARIDES IN MATERNAL SERUM ARE ASSOCIATED WITH MATERNAL PRE-PREGNANCY BMI AND SUBCUTANEOUS BODY FAT THICKNESS

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Human milk oligosaccharides (HMO) can act as signal molecules in maturation and adaptation of the newborn's immunity and metabolism. We previously found HMO already present in maternal serum during pregnancy. Here, we hypothesized that prenatal HMO composition and concentration are influenced by maternal metabolic factors such as BMI and body fat with potential implications for fetal metabolic programming. We analyzed HMO in serum from healthy pregnant women (n=27) at 3 visits during pregnancy, V1, V2 and V3 (11-14, 20-24, and 30-33 gestational weeks, respectively) using HPLC with fluorescence detection. HMO concentrations of 16 individual HMO were determined using an internal standard, or expressed as relative abundances of the summed total HMO. Associations of BMI and total subcutaneous fat tissue (SAT, measured by lipometer) with individual HMO were analyzed performing Spearman correlation. We found maternal metabolic factors significantly associated with HMO at V2, but not at V1 or V3. Pre-pregnancy BMI negatively correlated with absolute and relative 2'-fucosyllactose (2'FL) concentrations ($r=-.37$, $p=.043$ and $r=-.37$, $p=.035$, respectively), and positively correlated with relative 3'-sialyllactose (3'SL) abundance ($r=.36$, $p=.043$). Strongest associations were found for total SAT thickness at V1 and V2 with absolute ($r=-.49$, $p=.006$ and $r=-.65$, $p.0001$) and relative 2'FL concentrations ($r=-.56$, $p=.001$ and $r=-.61$, $p=.001$, respectively). Relative abundance of 3'SL was positively correlated with total SAT ($r=.48$, $p=.016$). In conclusion, HMO concentration and composition were associated with maternal BMI and SAT thickness, suggesting that body composition influences prenatal HMO profiles, potentially contributing to fetal programming of adiposity and metabolic diseases.

MATERNAL HEIGHT, BODY MASS INDEX AND THE RISK OF NEONATAL HYPOXIC ISCHEMIC ENCEPHALOPATHY

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BACKGROUND: Hypoxic ischemic encephalopathy (HIE) is a syndrome in the neonate caused by birth asphyxia and if moderate to severe, there is an association with neurologic morbidity and mortality. **OBJECTIVES:** We aimed to evaluate the association between maternal height and body mass index (BMI) and HIE. **STUDY DESIGN:** A nationwide register study from Sweden, including live born infants of primiparous women at 36 weeks or beyond, between 2009 and 2013. Therapeutic hypothermia was used as surrogate for moderate to severe HIE. **Exposures:** maternal height and weight. **Outcome:** moderate to severe HIE. Women were categorized into normal height (≥ 161 cm) or short maternal height (< 161 cm), normal-weight (BMI < 25 kg/m²) or overweight (BMI ≥ 25 kg/m²). Additionally, women were categorized into only short, only overweight, short *and* overweight,

whereas normal height and weight were used as a reference. Adjusted odds ratios (AOR) with 95% confidence interval (CI) for HIE were calculated by multivariable regression models. **RESULTS:** Of the 192,223 births, 157 infants had moderate to severe HIE (0.82 per 1,000 live births). Short *and* overweight women had more than doubled risk of giving birth to an infant with moderate to severe HIE compared normal height and weight women (AOR 2.61; 95 % CI 1.54–4.43). If only vaginal deliveries were considered, the association was strengthened (AOR 4.60; 95 % CI 1.56–13.59). **CONCLUSION:** The combination of short maternal height and overweight more than doubled the risk of having an infant with moderate to severe HIE.

ASSOCIATION OF THIRD-TRIMESTER RATE OF GESTATIONAL WEIGHT GAIN ON MATERNAL AND NEONATAL HEALTH OUTCOMES IN PREGNANT WOMEN WITH NORMAL ORAL GLUCOSE TOLERANCE TEST

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Objective: To assess the associations of third-trimester rate of gestational weight gain (GWG) on maternal and neonatal health outcomes in women with normal oral glucose tolerance test (OGTT). **Methods:** This was a retrospective cohort study of full term singleton live births (N=1967) in women with a normal OGTT result during 24-28 weeks of gestation, who gave birth in the Beijing Gynecology and Obstetrics Hospital, Capital Medical University, between January and April of 2013. The subjects were divided into 3 groups based on third-trimester rate of GWG category (insufficient, normal, or excessive was determined by the recommendation by 2009 Institute of Medicine). Pregnancy outcomes were recorded..

Results: Among the 1967 women analyzed, third trimester weight gain distribution (n [%]) was: normal 575 (29.2%), excessive 982 (49.9%), and insufficient 410 (20.8%). As compared to the normal GWG group : the excessive GWG women had an increased risk of cesarean section [30.2% (297/982) vs 22.2% (128/575)], hypertensive disorders of pregnancy [4.0% (39/982) vs 1.9% (11/575)] (all P<0.01). The excessive GWG was at increased risks of macrosomia infants (OR=1.59, 95% CI 1.10-2.30) and low birth weight infants (OR=2.25, 95% CI 1.03-4.94). The insufficient GWG was associated with an elevated risk of low birth weight infants (OR=3.21, 95% CI 2.56-7.51, p<0.01). **Conclusions:** Excessive rate of GWG in third trimester in pregnant women with normal OGTT results increases the risks of adverse maternal and neonatal outcomes. GWG in third trimester should be paid more attention after a normal OGTT result.

THE FEATURES OF PREGNANCY'S CURRENT AND OUTCOMES IN WOMEN WITH OBESITY

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The purpose of the research was to study the current and outcomes of the pregnancy in women with the obesity. **Materials and methods.** The research was carried out in perinatal center in Astana, Kazakhstan. The 84 women were examined, the main group was consisted of 29 women with initial BMI 30,4 kg/m²; Q1-27,95, Q3-36,2 at the age of M-30,65 years (SD=5,007). The control group was consisted of 55 women with initial BMI 22,8 kg/m²; Q1-21, Q3-24 comparable by age. The current and outcomes of the pregnancy were traced. **The Results.** It was revealed that the frequency of gestational hypertension and edema of pregnant women were significantly higher in main group, accordingly $\chi^2=4,601$ df=1 p=0,032 and $\chi^2=8,906$ df=1 p=0,003. Studying the weight gaining during

the whole pregnancy it was found out that the women with the obesity added Me-14 kg, Q1-9,5;Q3-16,5. The pregnant women with the obesity have exceeded the allowable weight gaining significantly more often during the whole period of gestation, RR=3,501 95% CI (2,117-5,791). In addition , it was found out that the weight of the newborns in the main group significantly more often exceeded 4000 grams, RR=2,032 95% CI (1,146-3,603). In women of the main group the birth trauma was detected significantly more often, RR=2,950 95% CI (1,456-5,979). Conclusion. The level of BMI has significant influence on the current and outcomes of the pregnancy, contributing to the development of such complications as gestational arterial hypertension, edema of the pregnant women, birth trauma and macrosomia.

SPANISH REFERENCES OF GESTATIONAL INCREASE WEIGHT AND ADVERSE OUTCOMES

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Background: An association between gestational weight gain (GWG) and both short- and long-term maternal and child outcomes has been widely described. Nevertheless, no agreement exists on which should be the optimal range for maternal weight increase. The reviewed IOM charts (2009), performed on American population, have been the most used in the last years. Several studies have shown that wider ranges of optimal maternal weight gain (MWG) were not associated with higher rates of adverse outcomes Objective: To propose Spanish-Mediterranean GWG charts according pre-pregnancy BMI and to evaluate their performance in identifying high-risk pregnancies for bad outcomes. Design: We retrospectively included all our singleton pregnancies followed-up in our centre from 8 weeks of gestation up to the delivery. WHO guidelines have been used to establish the BMI cut-offs. 3183 singleton pregnancies were included. Patients with pre-gestational diabetes, Gestational Diabetes and Chronic Hypertension were excluded. A quantile regression based on LMS methodology (Cole and Green 1992) was used for the estimation of the curves. The references and ranges were expressed in centiles. The statistical package Gamlss and the software R allowed to expressed them as soft centiles. Results: References curves for GWG were performed in our population according BMI. In a second term, we evaluated their performance to evaluate adverse outcomes (preeclampsia, cesarean section, instrumental delivery, macrosomia, low-birth weight) and compare it with IOM curves. Conclusion: We propose Spanish-Mediterranean GWG charts and compare their performance with IOM curves.

THE HEALTHY MUMS AND BABIES (HUMBA) RANDOMISED CONTROLLED DEMONSTRATION TRIAL PROTOCOL

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The Healthy Mums and Babies (HUMBA) trial was developed in response to an external review of maternity care in South Auckland, New Zealand. The review highlighted the contribution of obesity to the high perinatal mortality rate in the region especially among Pacific women. Obesity and excessive gestational weight gain increase risks of numerous pregnancy complications for the mother and the offspring as well as the risk of long term health problems for both. HUMBA is a two by two factorial

randomised controlled demonstration trial, aiming to reduce excessive gestational weight gain in the mother, optimise infant birthweight and improve maternal glucose metabolism. The study will recruit 220 women with BMI \geq 30 and singleton pregnancy at 12⁰-17⁶ weeks' gestation. Women with diabetes, previous bariatric surgery, taking probiotics or tablets affecting appetite and glucose metabolism will be excluded. Consenting participants are randomised via a web-based protocol, randomize.net to receive 1) a nutritional intervention or routine care, and 2) either an oral probiotic or placebo capsule. Nutritional intervention includes four face-to-face visits provided by community health workers trained in pregnancy nutrition, and supporting text messages. Participants with routine care will receive best practice pregnancy nutrition pamphlets from the New Zealand Ministry of Health. Probiotic capsules contains *Lactobacillus rhamnosus GG* and *Bifidobacterium lactis BB12*, 7x10⁹ colony-forming units per capsule. Probiotic and placebo capsules are prescribed one per day from recruitment until birth in a double blinded fashion. One hundred and ninety women are recruited to date. Data on recruitment and participant demographics will be presented.

ENABLERS AND BARRIERS TO PHYSICAL ACTIVITY IN OVERWEIGHT AND OBESE PREGNANT WOMEN: AN ANALYSIS INFORMED BY THE THEORETICAL DOMAINS FRAMEWORK AND COM-B MODEL

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Obesity during pregnancy is associated with increased risk of gestational diabetes mellitus (GDM) and other complications. Although physical activity (PA) is a modifiable lifestyle factor that can help to prevent GDM, many women reduce their PA during pregnancy. Interventions targeting PA in pregnancy are on-going but few identify the underlying behaviour change mechanisms by which the intervention is expected to work. Using behaviour change methods, this study aimed to identify the enablers and barriers to PA in overweight and obese pregnant women. Semi-structured interviews were conducted with a purposive sample of overweight and obese women attending Cork University Maternity Hospital, Ireland (n=30). Interviews were recorded and transcribed into NVivo V.10 software. Data analysis followed the framework approach, drawing on the Theoretical Domains Framework (TDF) and the COM-B model (capability, motivation, opportunity and behaviour). Social opportunity to engage in PA was identified as an enabler; pregnant women suggested being active was easier when supported by their partners. Knowledge was a commonly reported barrier with women lacking information on safe activities during pregnancy and describing the information received from their midwife as 'limited'. Physical capability and physical opportunity to carry out PA were also identified as barriers; experiencing pain, a lack of time, having other children, and working prevented women from being active. This study is a theoretical starting point in making a 'behavioural diagnoses' and the results will be used to inform the development of an intervention to increase PA levels among overweight and obese pregnant women

HEALTH CARE PROFESSIONAL'S EXPERIENCE OF LIFESTYLE MANAGEMENT IN OVERWEIGHT AND OBESE PREGNANT WOMEN: A QUALITATIVE STUDY

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Obesity during pregnancy is associated with a number of complications including gestational diabetes mellitus (GDM). Currently, little is known about guidelines in clinical practice and the challenges faced by health care professionals (HCPs). The aim of this study is to explore HCPs experiences of lifestyle management for women who are overweight and obese in pregnancy with the view to informing the development of an antenatal lifestyle intervention. Semi-structured interviews were conducted with a purposive sample of health care professionals (HCPs) from Cork University Maternity Hospital (CUMH) (n=10) and with a sample of General Practitioners (GPs) working in primary care in the region (n=7). The interviews were digitally recorded and transcribed into NVivo V.10 software. Thematic analysis is on-going. Preliminary results identified 'knowledge of weight management' and 'antenatal services' as key issues. A lack of knowledge was evident involving risks, complications and initiating a conversation around overweight and obesity in pregnancy. Variation exists around what is considered appropriate weight gain and whether HCPs were following any particular guidelines. Lifestyle factors were not routinely discussed with the women and furthermore, a lack of communication is very evident between HCPs in the hospital and GPs in terms of the services provided. HCPs expressed challenges when communicating with their patients about weight management in pregnancy. By ensuring midwives and other HCPs have the knowledge, skills and opportunity to discuss weight and lifestyle factors with pregnant women, the women in turn may be more motivated to maintain a healthy behaviour's during pregnancy.

PREGESTATIONAL OBESITY ALTERS REACTIVITY RESPONSE TO VASOACTIVE MOLECULES IN HUMAN FETOPLACENTAL MICROVESSELS, INDEPENDENT OF GESTATIONAL WEIGHT GAIN

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Obesity is increasing at worldwide, rising the number of women with pregestational obesity (BMI30 kg/m²). Thus, a correct management of the gestational weight gain (GWG) is crucial. Obesity

associates with altered response to vasoactive molecules (i.e., nitric oxide (NO) and endothelin-1 (ET-1)) in several vascular beds, meanwhile excessive GWG (eGWG) relates with lower insulin-mediated dilation of human umbilical vein rings. However, whether pregestational obesity associates with reduced foetoplacental microvascular response has not been described. Anthropometric parameters were recorded, and placental microvascular veins rings from the third chorionic branch were obtained from women with normal (NW) or obese (OB) pregestational BMI coursing with eGWG or adequate GWG (aGWG). Vascular reactivity to adenosine (10^{-6} to 10^{-3} M, 5 min), insulin (10^{-10} to 10^{-6} M, 5 min) and ET-1 (10^{-14} to 10^{-6} M, 5 min) was evaluated in KCl-precontracted (32.5 mM) vein rings using wire myography in the absence/presence of 100 μ M of NOS inhibitor. Mothers with pregestational OB delivered larger ($P<0.05$, $n=295-879$) newborn (2.7 ± 0.3 ponderal index (PI)) than NW (2.6 ± 0.3 PI). In OB, insulin and adenosine were unable to alter vascular reactivity in both GWG conditions. In NW, the eGWG reduces the response NO-dependent vasodilators molecules ($87\pm 5\%$ for insulin, $29\pm 3\%$ for adenosine). The maximal response to ET-1 is increased in OB aGWG compare to NW aGWG (1.4 \pm 0.5-fold). The eGWG increases effective half-maximal concentration (EC_{50}) in NW and OB (23 \pm 10-fold and 7.6 \pm 3-fold, respectively) of ET-1. In conclusion, pregestational obesity, independently of GWG, reduce the response to vasoactive molecules in human foetoplacental microvasculature.

MATERNAL AND NEONATAL OUTCOMES IN GESTATIONAL DIABETES.

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Aim: To analyse maternal and neonatal outcomes of gestational diabetes (GD) and identify factors associated with neonatal complications. **Methods:** A retrospective analysis of singleton GD pregnancies between 2010-2015 in a large cohort in Rotterdam, the Netherlands. Outcomes were compared to a control group (CG; no GD, diabetes mellitus type 1 or 2) from the Netherlands Perinatal Registry. **Results:** 1008 consecutive singleton pregnancies with GD were analysed, $N=389$ (38.7%) of women required additional insulin therapy. Compared to the CG ($N=578,311$), the rates of pre-eclampsia (3.8% vs. 5.1%), large for gestational age (P90) (8.5% vs. 10.7%) and pre-term birth (6.6% vs. 8.1%) were not significantly different. The rate of labour induction was higher compared to the CG (56% vs. 29.4%). Neonatal complications defined as a composite neonatal outcome including: death (perinatal/neonatal), large for gestational age (P90), APGAR 7 at 5 minutes, pre-term birth (< 37 weeks), neonatal hypoglycaemia (< 2.6 mmol/L), admission to neonatology department, hyperbilirubinemia requiring phototherapy or birth trauma (shoulder dystocia, brachial plexus injury, bone fracture (humerus/clavicle) occurred in $N=348$ (34,5%). Independent risk factors predicting the composite neonatal outcome were BMI ≥ 30 (OR 1.5 [1.00-2.1] $p=0.046$) and insulin therapy (OR 1.5 [1.0-2.2] $p=0.026$). **Conclusions:** In our population, GD adverse maternal and neonatal outcomes are comparable to normoglycaemic pregnancies. However, obesity and insulin therapy are predictive of an increased risk of neonatal complications. This study underlines the importance of weight control before pregnancy. Health care professionals should play an important role in the prevention of obesity in young women.

OVERWEIGHT AND OBESE WOMEN EXCEED GESTATIONAL WEIGHT GAIN RECOMMENDATIONS AND PRESERVE THEIR BODY ADIPOSITY

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Introduction: Excess gestational weight gain (GWG) has been linked with maternal and offspring morbidity. To reduce morbidity, Institute of Medicine (IOM) has given guidelines for GWG. Body composition gives more precise information about the health and adiposity of the body than weight. The aim of this study was to investigate the relationship between GWG and body composition of overweight and obese pregnant women. Methods: Body composition of 61 overweight (BMI ≥ 25 kg/m²) and 49 obese (BMI ≥ 30 kg/m²) women was measured with air displacement plethysmography at mean 13 and 35 gestational weeks. Women were classified into groups of excess, ideal and inadequate GWG rate according to the IOM recommendations. Results: The obese gained less weight than overweight women (8.1 vs 9.9kg, p= 0.011). This was attributable to a lower increase in fat mass (0.4 vs 2.5kg, p= 0.002), while fat free mass gain (7.6 vs 7.5kg, p=0.648) did not differ. Consequently, obese had a greater fall in BF% (-3.4 vs -1.8%, p=0.001) than overweight women. Of the women 77% exceeded the recommended GWG. Women with excess compared to ideal GWG had smaller fall in body fat percentage (BF %) (-1.9 vs -3.5%, p=0.036). Conclusions: On average, BF% decreases over pregnancy in both overweight and obese women, but the decrease is more pronounced in obese women. Still, majority of overweight and obese women have excessive GWG, which is associated to lesser decrease in body adiposity. To improve maternal and child health, new methods for preventing excessive GWG is needed.

INTRA-OBSERVER REPRODUCIBILITY OF FETAL BIOMETRY IN THIRD TRIMESTER: DOES MATERNAL WEIGHT MATTER?

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OBJECTIVES: To evaluate intra and inter-observer reproducibility of third trimester ultrasound fetal biometric measurements in pregnant women with normal weight and obese/excess weight women. **STUDY DESIGN:** We conducted a prospective study to evaluate fetal ultrasound measurements at 35weeks^{0days}-36weeks^{6days}: biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur length (FL). Each measurement was evaluated twice by the first observer and a third time by a second observer that was blinded to the other observer's measurements. Consensus between and among observers was analyzed using the Crohnbach's α reliability coefficient (RC). We also compared intra and inter-observer measurements within subgroups – women with normal weight (body mass index ≤ 25 Kg/m²) and women with excess weight or obesity (body mass index ≥ 25 Kg/m²) with paired sample t-test. Differences with *p-value*0.05 were considered statistically significant. **RESULTS:** We included 197 women, 133 with normal weight (68%) and 64 with excess weight or obesity (32%). In normal weight women, intra-observer α -RC for BPD, HC, AC and FL were: $\alpha=0.97$; $\alpha=0.95$; $\alpha=0.98$ and $\alpha=0.96$, respectively. Inter-observer α -RC were: $\alpha=0.97$; $\alpha=0.93$; $\alpha=0.98$ and $\alpha=0.95$, respectively. For excess weight or obese women, intra-observer α -RC for BPD, HC, AC and FL were: $\alpha=0.97$; $\alpha=0.93$; $\alpha=0.98$ and $\alpha=0.96$, respectively. Inter-observer α -RC were: $\alpha=0.97$; $\alpha=0.94$; $\alpha=0.98$ and $\alpha=0.96$, respectively. Intra and inter-observer differences for both groups were not considered statistically significant. **CONCLUSIONS:** Our results demonstrate a high intra and inter-observer reproducibility of third trimester ultrasound fetal biometric measurements, even for excess weight or obese women.

Материнская ожирение и риски осложнений для матери и новорожденных

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Материнское ожирение стало одним из наиболее часто встречающихся факторов риска в акушерской практике. Ожирение во время беременности связано с повышенным риском развития ряда серьезных неблагоприятных исходов, в том числе выкидыша, внутриутробной врожденных аномалий, тромбоэмболии, гестационный диабет, преэклампсия, дисфункциональные труда, послеродовом кровотечении, мертворождения, неонатальной болезни или смерти и других. Методы: ретроспективное исследование когорты в том числе 18 325 родов, которые были в течение последних трех лет в перинатальном центре. Ожирение во время беременности был определен как индекс массы тела (ИМТ) от 30 кг / м² или более при первой дородовой консультации. Всего у женщин с ожирением составила 12,2%, в том числе 118 (5,2%) женщин с ИМТ 35 кг / м². Результаты: Наиболее частые осложнения у беременных женщин с ожирением были преэклампсии у 17,9% женщин, тяжелой преэклампсии была в 6,2% женщин, гипертония была в каждой четвертой женщины, гестационный диабет был в 8,6% случаев. Преждевременные разрыв плодных оболочек и преждевременных родов были в 5,2% поставок. Кесарево сечение было выполнено в 36,8% случаев по различным показаниям. Макросомии и выше вес при рождении был замечен в каждом пятом женщин. Низкая оценка неонатальной оценки по шкале Апгар (7 баллов) были в 2 раза чаще, чем женщины, которые не имели ожирение. Гипоксически-ишемическая энцефалопатия и конвульсии были у 15% новорожденных, которые могут быть ассоциации с неврологической инвалидности. Выводы: преэклампсия, гипертония и гестационный диабет являются общие результаты в ожирением матерей. Макросомии, более высокий вес при рождении и низкий балл по шкале Апгар являются плохой прогноз для младенцев. Ключевые слова: материнская ожирение, осложнения, неонатальный.

NO-INDUCED NITROSATIVE STATUS IN HUMAN PLACENTA FROM OBESE WOMEN

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Objective. To evaluate the presence of endogenous S-nitrosylated proteins in cysteine residues in relation to antioxidant defense in placenta from lean and obese women. Material and Methods. Prospective case-control study about placental metabolism in lean (BMI25, n=9) and obese women (BMI30, n=9), according to pregestational Body Mass Index (BMI). Placentas were obtained after elective cesarean sections in uncomplicated pregnancies (gestational age 38.6 ±0.7 and 38.3 ±0.8 weeks, respectively). S-nitrosylation was measured using the Biotin-Switch assay while the expression and protein activity were assessed by immunoblotting and colorimetric methods, respectively. Comparisons between two groups were performed by using the U-Mann Whitney test. A p0.05 was accepted as a significant difference between variables compared. Results. We found a significant higher iNOS (inducible nitric oxide synthase) expression in placental tissue from obese women compared to lean women. Increased levels of S-nitrosylation were exhibited by catalase and decreased levels of placental S-nitrosylated target enzymes related to cell survival were found in obese women (ERK 1/2 and AKT) Conclusions. Obese women showed an altered placental nitrosative status. Nitric oxide may modulate placental proteins and metabolism in obese women.

OXIDATIVE STRESS IN HUMAN PLACENTA FROM OBESE WOMEN.

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Objective. To evaluate the presence of oxidative stress in placental tissue from lean and obese women. **Material and Methods.** Prospective case-control study about placental oxidative status in lean (BMI25, n=9) and obese women (BMI30, n=9), according to pregestational Body Mass Index (BMI). Placentas were obtained after elective cesarean sections in uncomplicated pregnancies (gestational age 38.6 ±0.7 and 38.3 ±0.8 weeks, respectively). The presence of oxidative status was determined studying oxidative placental markers (LPO) and antioxidant enzymes (catalase and SOD) by using immunoblotting and colorimetric methods. Comparisons between two groups were performed by using the U-Mann Whitney test. A p0.05 was accepted as a significant difference between variables compared. **Results.** We found higher LPO levels in placental tissue from obese women compared to lean women without statistically significant difference (2.5 vs 1.9 nmol MDA/protein mg; p=0.15). There were significant differences when comparing catalase enzymatic activity between lean and obese group (0.2 Vs 0.1 nmol/H₂O₂/min/protein mg; p=0.02, respectively) and also when comparing total antioxidant and SOD activities (0.034 Vs 0.022 μmol/Trolox/mg prot; p=0.04, respectively). **Conclusions.** Obese women showed higher placental oxidative stress levels and lower antioxidant activities levels.

NEW APPROACH IN DIAGNOSIS OF GESTATIONAL DIABETES IN OBESE PREGNANT LITHUANIAN WOMEN

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Objective. To assess carbohydrate metabolism disorders of obese pregnant women, comparing with normal weight women. To compare diagnostic criteria of gestational diabetes (GD) proposed by the World Health Organization (WHO) and Association of Diabetes in Pregnancy Study Groups (IADPSG). **Materials and methods.** A prospective case-control study involving 102 obese and 102 normal weight women consulting at the Hospital of LUHS before 14 weeks of pregnancy. Participants underwent a 75-g oral glucose tolerance test (OGTT) between 24 and 28 weeks of gestation. Samples were collected fasting, at 1 and 2 hours following the glucose load. Values of OGTT were compared in both groups. GD was diagnosed using WHO criteria when 2 h glucose was 7.8mmol/L or using IADPSG criteria when any of the three OGTT thresholds were met or exceeded: fasting 5.1 mmol/L, one hour 10 mmol/L, two hours 8.5 mmol/L. **Results.** All glycaemia values were statistically significant higher in obese than in normal weight women group (p0,001). Using WHO OGTT method GD was diagnosed in 7 (6.9 %) of obese vs. 3 (2.9 %) in control group (p=0,195, OR 2.43 (95 % CI (0.61 – 9.68)). Using IADPSG OGTT criteria GD was diagnosed in 42 (41.2 %) of obese vs. 10 (9.8 %) in control group (p=0.0001, OR 6.44 (95 % CI (3.00 – 13.81)). Using both diagnostic methods GD was diagnosed in 7 (6.9 %) obese women and in 3 (2.9 %) normal weight pregnant women (coincidence factor kappa K=0.262, p=0.001). **Conclusions.** More cases of GD were diagnosed using IADPSG criteria comparing with WHO criteria. Carbohydrates metabolism disorders in obese women are more significant compared with normal weight women.

THE ROLE OF UTERINE ARTERY DOPPLER IN THE PREDICTION OF COMPLICATIONS IN PREGNANCY IN OVERWEIGHT AND OBESE WOMEN

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Introduction: Obesity is increasing in the developed countries and becoming a serious health care problem. Hypertensive pathology in pregnancy can have consequences both to the fetus and the mother. The uterine artery Doppler is being used to predict this disease and therefore to prophylactic measures before its onset. Material and Methods: We evaluated the relation between BMI and Doppler of uterine arteries in the first and second trimester in tertiary level care unit in the year 2014. We selected 288 women with BMI over 25kg/m² who had their pregnancy follow up and delivery at our hospital were selected. Results: Mean age was 32 years (STD ± 6). The majority were Europeans (75%) and leucodermic (76%); 66% of patients had overweight (OW) and 34% were obese. Previous primary hypertension was diagnosed in 22,4% of obese patients and 5,8% in the OW group (*p* 0,000). Pathological uterine artery Doppler (PUAD) in first trimester was more frequent in obese patients than OW (3,1% vs. 0%, *p* 0,05). PUAD was also more frequent in obese patients in the second trimester ultrasound (6,1 vs. 3,7%) and with increasing BMI: 3,7% for OW; 7,7% for obesity I and 11,1% for obesity III. As for gestational weight gain (GWG), women with PUAD also had higher GWG: 7,7 vs. 1,9Kg for first trimester (*p* 0,02) and 24,3 vs. 11,2Kg for total GWG (*p* 0,02). Conclusion: In our study we saw that increasing BMI and GWG does correlate with pathological uterine artery Doppler.

OVERWEIGHT, OBESITY AND THE RISK OF HYPERTENSIVE DISEASE IN PREGNANCY

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Introduction: Obesity is increasing in the developed countries becoming a serious health care problem. In the non-pregnant women obesity is well correlated with the metabolic syndrome and all of its complications, namely hypertension and diabetes. In this study we evaluate the relation between increased BMI and hypertension in pregnancy. Material and Methods: We did a retrospective study in a tertiary level care unit and women with BMI ≥ 25kg/m² who had their pregnancy follow up and delivery at our hospital during the year 2014 were selected (n=288). Randomly, women with BMI < 25 were also selected (n=325). We evaluated the relation between BMI and gestational hypertension (GH) and pre-eclampsia (PE). Results: Mean age was 30 years (STD ± 6). The majority were Europeans (80%) and leucodermic (80%); 53% patients had normal weight, 31% were overweight (OW) and 16% were obese. Previous primary hypertension was present in 22,4% of obese patients, 5,8% in the OW group and 2,2% of normal weight (*p* 0,000). Both GH and PE were more common in the obesity group: 3,1% for GH and 2% for PE. In the overweight and obese group, patients without any hypertensive complication had a lower BMI than patients with GH or PE: 29 vs. 32 (*p* 0,03). The prevalence of GH was higher according to the increasing BMI: 1,6% in OW, 8,3% in severe obesity and 11% in morbid obesity (*p* 0,01). Conclusion: In our study increasing BMI does progressively increase the probability of GH or PE.

METABOLIC PROFILING OF GESTATIONAL DIABETES IN OBESE WOMEN DURING PREGNANCY

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Introduction: Pre-existing insulin resistance in obese women is implicated in Gestational Diabetes (GDM) risk, yet not all obese women develop the disorder. In view of the increasing prevalence of antenatal obesity and a need to understand the metabolic pathways of GDM in obese women not previously characterised, the aim of this study was to describe the biomarker patterns of GDM in an obese cohort at two distinct pregnancy time-points. Methods: This prospective cohort study was a secondary analysis using data from the UPBEAT trial (ISRCTN89971375). 646 women (median BMI 35.2 kg/m²) with complete metabolite data at time-point 1 (mean, 17⁺⁰ weeks') and time-point 2, (at OGTT – mean, 27⁺⁵ weeks') were included. 163 metabolites reflecting insulin resistance pathways were measured at both time-points including 147 from a targeted nuclear magnetic resonance (NMR) metabolome and 16 candidate biomarkers. Multivariate analyses were performed to compare obese GDM women with obese non-GDM women. Results: 30% of women (n=198) developed GDM (IADPSG criteria). Patterns of GDM-associated metabolites demonstrated multiple significant differences compared with non-GDM women. These included raised lipids and lipoprotein constituents in different sized VLDL sub-particles, triglyceride enrichment across lipoprotein particles, higher branched chain and aromatic amino acids, different patterns of fatty acids, ketone bodies, liver markers, adipokines and inflammatory markers. Similar differential patterns were evident both prior to diagnosis and at the time of disease. Conclusion: A metabolic phenotype associated with GDM is evident in affected obese women.

MATERNAL CARDIOVASCULAR RISK AS A MARKER OF METABOLIC STATUS AND FETOMATERNAL RISK IN OBESE PREGNANT WOMEN

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Cardiovascular disorders are among main reasons for morbidity and mortality in humans and risk factors for these diseases are increasingly common in younger and asymptomatic populations. Aim: to analyze cardiovascular risk (CVR) in a population of obese pregnant women without any form of hypertension. Material and method: observational prospective study of 568 normotensive women from a DALI (Vitamin D and Lifestyle for GDM Prevention) cohort. CVR was computed from Framingham equation using a calculator provided for research by University of Edinburgh, from maternal parameters collected at enrollment into DALI study, below 20 weeks of gestation. Results: participants' age: 31.8±5.1 years, baseline characteristics: GA: 15.2±2.5 weeks, BMI: 34.3±4.1 kg/m², CVR: 1.0±0.9 (IQR: 0.4-1.3). CVR was significantly associated with visceral adiposity index (R=0.13, p=0.004), 60-min and 120-min glucose levels in 75g OGTT (R=0.13, p=0.004; R=0.13, p=0.005, respectively), triglycerides: R=0.22, p=0.000, BMI: R=0.13, p=0.004, sleep parameters (daily hours of sleep R=-0.16, p=0.000, weekly number of days with snoring R=0.09, p=0.045), waist circumference: R=0.12, p=0.007, body fat percentage R=0.38 p=0.000; CVR was also associated with increased risk for operative delivery (AUROC 0.59, p=0.002) Conclusions: CV risk should be assessed in obese women in early pregnancy as a useful marker of combined metabolic disorders and a predictor of caesarean section.

EARLY PREGNANCY LIPIDS AND MATERNAL ANTHROPOMETRICS RELATED TO BODY FAT ARE PREDICTORS OF FETAL BODY COMPOSITION AND PERINATAL COMPLICATIONS IN OBESE PREGNANT WOMEN

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Obesity and metabolic syndrome is more common among pregnant women and deteriorates fetomaternal and neonatal outcome. Aim: to identify early pregnancy (GA20 weeks) non-glycemic metabolic predictors of fetal development and perinatal complications in women with BMI≥29 kg/m². Material and method: prospective observational analysis of 636 mother-newborn pairs from a DALI (Vitamin D and Lifestyle for GDM Prevention) cohort Results: participants' age: 32.1±5.3 years,

baseline characteristics: GA: 15.0±2.5 weeks, BMI: 34.4±4.2 kg/m², smokers: 15.1%; gestational weight gain (GWG): 7.5±4.9 kg, birth weight (BW): 3477±527g; pregnancy complications: chronic hypertension/gestational hypertension/preeclampsia: 15.9%/10.4%/3.2%; gestational diabetes: 31.8%, premature birth: 5.1%, caesarean section: 34.2%, BW4000g/LGA: 15.9%/12.2%; BW2500g/SGA: 3.1%/6.8%. GWG was associated with increased risk for BW4000g or LGA (AUROC=0.59, p=0.005; AUROC=0.64, p=0.035, respectively). Triglycerides and LDL-cholesterol were negatively linked to increased risk for SGA (AUROC=0.41, p=0.05; AUROC=0.38, p=0.012, respectively). BMI, neck circumference (NC) and waist circumference (WC) was associated with increased likelihood for caesarean section (AUROC=0.55, p=0.028; AUROC=0.58, p=0.57, p=0.002; AUROC=0.56, p=0.011). Maternal body fat anthropometrics were significant predictors for some markers of fetal adiposity measured in the third trimester: WC significantly predicted liver length: R²=0.03, p=0.008. Fat percentage significantly predicted fetal abdominal circumference: R²=0.02, p=0.002 and liver length: R²=0.05, p=0.001. Early pregnancy triglycerides, free fatty acids, HDL-cholesterol and LDL-cholesterol were significant predictors of fetal liver length. Associations remained significant after controlling for maternal glycemia.

Conclusions: 1/ maternal lipid profile and parameters of maternal adiposity can be useful predictors of fetal body composition and abnormal fetal growth in obese women.

Other

BISPHENOL A AND OCTYLPHENOL EXACERBATE THE TYPE 1 DIABETES MELLITUS MODEL

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It has been proposed that cellular Ca²⁺ signals activate hormone secretion. In pancreatic β cells, which produce insulin, Ca²⁺ signals have been known to contribute to insulin secretion. In previous study, demonstrated that endocrine disrupting chemicals (EDCs) such as bisphenol A (BPA) and Octylphenol (OP) could causes increase in insulin level and insulin transcription factors. But in regulations of plasma glucose level were not decreased as much as insulin increase. For identifying this phenomenon, we evaluate the HOMA-IR which is used for calculating insulin resistance, trace that EDCs has ability to increase insulin resistance. We hypothesized that EDCs disrupts calcium homeostasis and the altered intracellular calcium levels may induce insulin resistance. The expression of genes involved in transporting calcium ions to the endoplasmic reticulum (ER) was decrease while the expression of those affecting the removal of calcium from the ER was increased. Depletion of calcium from the ER leads to ER-stress and can induce insulin resistance. Taken together, these results imply that the disruption of calcium homeostasis by EDCs induces ER-stress and leads to the insulin resistance. Additionally, findings from this study suggest that imbalances in calcium homeostasis due to EDCs such as BPA and OP could promote insulin resistance and its harmfulness especially to the Type I diabetes mellitus patients.

OUTCOME OF EXTERNAL CEPHALIC VERSION IN SULTAN QABOOS UNIVERSITY HOSPITAL FROM 2004 TO 2014

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Objective: To study success rate and feto-maternal complications of external cephalic version for breech presentation (ECV) at term. **Method:** This is a retrospective, cross sectional study conducted in women who had ECV for breech presentation at term who attended SQUH, Muscat, Oman for their care between 1st January 2004 and 30th of June 2014. **Results:** Fifty nine women were included in the study. External cephalic version was successful in 44 % patients. The majority 80.8 % of this group achieved the vaginal delivery. The rate of caesarean section was 49%. The most common indication for caesarean section was failed ECV. There was no fetal adverse outcome and no major maternal complications. **Conclusion:** External cephalic version has good success rate, relatively safe, and helps to avoid a significant number of caesarean sections, so well equipped obstetrics unit should routinely offer the procedure in selected cases. **Keywords:** External Cephalic Version. Breech Presentation. Success Rate. Fetomaternal Complications.

PRENATAL EXPOSURE TO SUBSTANCES OF ABUSE AND PSYCHOACTIVE DRUGS OF PRESCRIPTION DETECTED BY MATERNAL HAIR AND MECONIUM

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BACKGROUND Substances of abuse and psychoactive drugs of prescription can induce deleterious effects due to prenatal exposure. There is an underreporting by pregnant AIM To know the prevalence of prenatal exposure to substances of abuse and psychoactive drugs of prescription through the analysis of maternal hair and meconium.

METHODS A prospective cohort study of 513 women-newborn dyads was carried out at the time of birth. An anonymous and validated questionnaire was filled in by pregnant women. Maternal hair and neonatal meconium were obtained for analysis. **RESULTS** A total of 14 mother-newborn dyads samples were positive, mainly to cannabis and SSRIs antidepressants. The prevalence of substances of abuse was 1.2% in maternal hair and 0.4% in meconium; the prevalence of psychoactive drugs of prescription was 1.7% and 1.2%, respectively. When women disclaimed consumption there was a 27.3% positive samples for substances of abuse in maternal hair and 18.2% in meconium, but no exposure of psychoactive drugs were detected. **CONCLUSION** Alternative matrices are a good alternative to study prenatal exposure to substances of abuse in those suspicious cases that disclaim consumption in order to set specific social and health intervention. Maternal hair is a better biological matrix than meconium to analyze the exposure to substances of abuse and psychoactive drugs of prescription in pregnancy.

SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH THE CONSUMPTION OF SUBSTANCES OF ABUSE AND PSYCHOACTIVE DRUGS OF PRESCRIPTION IN PREGNANCY

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Background Substances of abuse and psychoactive drugs of prescription can induce deleterious effects due to prenatal exposure. The prevalence of consumption differs between European countries. The aim was to define sociodemographic factors associated with substances of abuse and psychotropic drugs. **Methods** A prospective study was carried out in pregnant women at the time of birth. An anonymous and validated questionnaire was filled in by pregnant women. Data about educational level, occupation, consumption of substances of abuse and psychoactive drugs of prescription during pregnancy and other variables like age and parity were collected. **Results** A total of 513 women

included in the study. 15% of women declared smoking during pregnancy, 7% consumption of alcohol, 1.4% cannabis and 3.5% psychotropic drugs of prescription. We found statistical differences between education level and the use of tobacco and illicit drugs. Women working in the service sector and unemployed consumed more often tobacco. Young women consumed more cannabis. Finally, there was an association between cannabis, psychotropic drugs of prescription and tobacco consumption. Conclusions Consumption of substances of abuse and psychoactive drugs of prescription are related to some sociodemographic factors (educational level and occupation). However, the consumption of these substances are probably due to multiples causes. It is difficult to establish a sociodemographic profile for risk of abuse of substances. This point is extremely important in order to design strategies to reduce the consumption and deleterious effects of prenatal exposure. Future studies are needed to better define population at risk and to follow up these newborns.

THE VIEWS OF STUDENTS ON MATERNITY AND WOMEN'S HEALTH SIMULATION TRAINING

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Objective: Simulation training provide opportunity for students to use their own knowledge and skills during the course. This study was performed in order to evaluate the effectiveness of simulation training on maternity-women health course.

Method: The research is a descriptive study. A total of 48 students were included in the sampling who receive maternity and women's health course. Data were collected by two questionnaires forms. View of ten students were evaluated in interview method and were selected by random sampling method. For the analysis of data percentage and descriptive content analysis were used. **Findings:** It was determined that age average of students was 20.70 ± 0.98 . 87.5% of student were females and 12.5% were males. 87.5% of student were graduated from high school while 12.5% were graduated from vocational high school. Of the student, 25% stated they felt fear, 39.6% stated they felt anxiety and 25% stated, they felt mixed emotions. In interview students said that simulation is very important for patient safety. **Conclusion:** It is considered that usage of simulation education methods will contribute to development of students' skills in clinical environment. Students will overcome the fear of harming the patient, that they will act with self confidence and eventually contribution will be provided for self-confident nurses to be educated.

DIABETES KETOACIDOSIS AFTER SODIUM GLUCOSE CO-TRANSPORTER 2 INHIBITOR INITIATION

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There is a growing concern about the rare association of DKA (Diabetes Ketoacidosis) with SGLT2i (Sodium Glucose Co-transporter 2 inhibitors). In this case series of two patients we describe patients who were recently diagnosed with type 2 diabetes mellitus but developed DKA shortly after initiation of SGLT2i therapy. First patient is a 34 year old female who was initially started on metformin and liraglutide and canagliflozin was added to her regimen later. Second patient is a 55 year old female who was initially managed on insulin and janumet, canagliflozin was added later. However both these patients presented with DKA few months later. Both the patients who developed DKA with SGLT2i use were later diagnosed as T1DM but presumed type 2 diabetes. Clinical profile later show presence of anti insulin and GAD antibody levels and one of the patients was in "honeymoon" phase as noticed

with normal C peptide levels upon initial visit. It thus highlights the need for treating clinicians to choose SGLT2i wisely in young newly diagnosed patients where the possibility of adult onset type 1 diabetes should be ruled out before initiation of SGLT2i therapy.

ADVERSE OUTCOMES AMONG PREGNANT ADOLESCENCES: REVIEW OF THE LITERATURE.

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Adolescent pregnancy is associated with unique challenges, girls between 15 and 19 years give birth to around 16 million babies each year, around 11% of births worldwide. Adolescent pregnancy is associated to several adverse outcomes, including maternal anemia and mental health problems such as depression, substance abuse, and posttraumatic stress disorder. However there is also higher risk of adverse fetal/neonatal outcomes, such as preterm delivery, intrauterine growth retardation, low birthweight, lower Apgar at 5 minutes, higher neonatal mortality and higher risk of pregnancy complications in a second pregnancy during adolescence. Placenta previa has more probability of occurring during teenage pregnancy. The incidence of caesarean section delivery is lower in adolescents, and they also have lower breastfeeding initiation and duration rates. These complications tend to be more frequent in younger pregnant teenagers. Pregnant adolescent girls have unique needs, it's important a multidisciplinary pregnancy approach and knowledge of their social and economical background, understanding their personal experiences, and behaviors during the pregnancy and postpartum periods may contribute to improvement of their maternity care. In this concise review, we have provided the overview of the complications associated with teen pregnancy, and notice the need for special medical care to achieve better pregnancy outcomes.

THROMBOCYTOPENIA IN PREGANCY.

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Thrombocytopenia has been defined as a platelet count less than $150 \times 10^9/L$, is the second most common hematologic abnormality encountered during pregnancy, occurring in 7-12% of pregnant women. Thrombocytopenia can result from a wide range of causes, producing different maternal and fetal outcomes. Although the most common cause is Gestational Thrombocytopenia (80% of the cases), a benign condition, some are serious medical conditions associated with substantial maternal and/or fetal/neonatal morbidity and mortality. Accurate identification of the aetiology of the thrombocytopenia and appropriate clinical management are crucial to better pregnancy and fetal/neonatal results. With the increased recognition of maternal and fetal thrombocytopenia, started the controversies associated with the obstetric management of this disorder. It's important to practitioners carefully evaluate the clinical/ financial costs and the benefits of assessing the risk of maternal/fetal bleeding complications of invasive diagnostic tests/interventions. And also weigh the vantages of the treatment against its adverse effects. In this concise review, we have provided the overview of differential diagnosis and treatment of thrombocytopenia diagnosed during pregnancy.

PARACRINE POTENTIAL OF HUMAN MESENCHYMAL STEM CELLS FROM FETAL TISSUES – IN VITRO STUDY.

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AIM: To investigate if fetal tissues (umbilical cord-UC, amniotic membrane-AM) can provide mesenchymal stem cells (MSC) suitable for immunomodulative therapy and regenerative medicine. **METHODS:** The tissues were obtained from pregnant women with their written consent and the approval of the Bioethics Committee. From 16 patients analyzed, 4 were excluded due to premature rupture of membranes and ongoing infection. UC-MSC (n=6) and AM-MSC (n=6) were isolated and cultured up to the 5th passage in growth medium. Luminex was used to assess the level of endothelial growth factor, IL-6, IL-10, tumor necrosis factor- α , transforming growth factor- β , vaso-endothelial growth factor- α and metalloproteinase 1 & 13 in collected supernatants. For control we have used 6 samples of MSC from human adipose tissue (AD-MSC). MSC identity was confirmed in vitro by using flow cytometry and differentiation assays. **RESULTS:** Up to 4mln UC-MSC were harvested from the tissue explants by adherent method (2weeks) while up to 6mln of AM-MSC were acquired by trypsin and collagenase digestion method. Flow cytometric evaluation confirmed expression CD105 (UM-MSC 81% AM-MSC 75%), CD73 (94% and 88%) and CD90 (84% and 85%). For both cell sources we completed adipose, bone and chondrocytes differentiation. UC-MSC showed significantly higher production of TGF- β and lower production of VEGF- α , comparing to AD-MSC (p=0,0043) and to AM-MSC (p=0,039). AM-MSCs showed significantly lower level of MMP-8 than UC-MSCs and there was no difference in levels of released cytokines comparing to AD-MSCs (p=0,024). **CONCLUSION:** Human umbilical cord and amniotic membrane are rich source of MSC which can be easily isolated promptly after delivery in quantities suitable for cell-therapy. AM-MSC show similar production of tested factors to currently used AD-MSC, while UC-MSC secretive profile differed from AM and AD-MSC. Presented results suggests that perinatal tissues are suitable for auto-transplantation in neonates who need immunomodulative therapy, especially when time factor is important in treatment.

TACKLING HEALTH BEHAVIORS IN COUPLES WITH RECENT GESTATIONAL DIABETES: THE MOMMII PROGRAM

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Background: Women with previous gestational diabetes are at high risk for diabetes. We recently demonstrated that their partners are also at increased risk. The objective is to evaluate a health behaviour change program in couples within 5 years of a gestational diabetes pregnancy. **Methods:** The 13-week program included 5 group sessions (healthy meal preparation and exercise under supervision, with discussion of strategies to integrate these into daily life) with on-site childcare and web/telephone-based support. We computed mean change from baseline (95% confidence intervals, CI) for daily step counts, mindful eating behaviors and cardiometabolic parameters (fasting and 2-h post load plasma glucose, blood pressure). **Results:** Among the 59 couples enrolled, 46 mothers and 45 partners completed final evaluations. On average, they participated in 3.4 (SD 1.2) sessions. By the end of the program, participants performed an additional 1,355 steps/day (95%CI 740, 1,970; baseline: 7481 SD 3281 steps/day) Self-reported eating mindfulness increased (0.2, 95%CI 0.1, 0.3; baseline score 2.8 SD 0.3). No improvements in fasting glucose (0.07 mmol/L, 95%CI 0.01, 0.14; baseline 5.2 SD 0.5 mmol/L) and 2-h glucose (0.15 mmol/L, 95%CI -0.18, 0.48; baseline 5.5 SD 1.6 mmol/L) were observed. Systolic blood pressure decreased (-2.7 mmHg, 95%CI -4.4, -1.0; baseline 119.2 SD 13.3 mmHg). **Conclusions:** A tailored group-based intervention for couples with recent gestational diabetes lead to improvements in health behaviours, such as being more physically active and eating more mindfully. Measures and insulin resistance were normal at baseline and no conclusive changes were detected; blood pressure levels did decrease.

TRADITIONAL PRACTICES OF MOTHER CARE IN POSTPARTUM PERIOD

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Objective: In various cultures, the postpartum period is taken into hand as a sensitivity period and various traditional practices are applied in order to protect mother's and baby's health. The aim of this study is determine traditional practices of mother care in postpartum period in Konya city. **Material and methots:** The research is a descriptive and cross-sectional study. This study was carried out among 291 women at the first 8 weeks of postpartum period who visited to family health centers from 1st June to 1st December 2015 and who agreed to study. The data were collected using questionnaire form. **Results:** It was determined that 42.6% of women at aged between 27-35 years and 60.8% of them were literate and primary education graduate. It was also determined that 15.8% of women try to solve problem with some traditional practices when they have any health problem and 90.0% of them take into account traditional practices to varying degrees. Based on the results; it shows that 84.5% of women applied a traditional practice of mother care in postpartum period. The most popular practices for increasing of breast milk (%97,9), for protecting *incubus* "albasmasi" (%81,8), for get ride of incubus (%74,9) and preventing postpartum bleeding (%14,1). **Conclusion:** Women within the scope of research place importance on traditional practices and they maintain some traditional practices to mother care in the postpartum period.

ASSOCIATION BETWEEN GENETICS AND METABOLIC PARAMETERS IN WOMEN WITH PREVIOUSLY DIAGNOSED GESTATIONAL DIABETES MELLITUS

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Objective: To determine the association of genetic variants of *TCF7L2* gene and metabolic parameters(glycaemia, insulin, adypocytokines, incretins) in women with previously diagnosed GDM. **Methods:** We examined 135 women with previously(15-43 years ago) diagnosed GDM. BMI, metabolic syndrome (MS) was evaluated. Fasting plasma glucose (FPG) was examined for women with DM. OGTT was performed for carbohydrate metabolism testing for the rest. Biochemical data (glycaemia,fasting plasma insulin,adiponectine,leptine,GIP,GLP-1) were tested, HOMA-IR was calculated. *TCF7L2* SNP common variants(rs7901695, rs7903146, rs7895340, rs11196205, rs12255372) were set. The results were considered statistically significant at p0.05. **Results:** The mean age was 53,42±8,29years, BMI–30,96±7,66kg/m². Age differed in separate carbohydrate dysmetabolism groups(p = 0.006). Carbohydrate dysmetabolism was set for 57%: 9(6.7%) were diagnosed with IFG, 13(9.6%) with IGT, 55(40.7%) with DM. Only *TCF7L2* rs7903146 CT allele more frequently was observed(40(69%)vs.18(31%)) in women with impaired carbohydrate metabolism(p=0.025). A multivariate logistic regression analysis showed that OR of developing DM in women with *TCF7L2* rs7903146 CT allele is 2.85(CI 1.17to6.93). We did not find any statistically significant differences in biochemical testings (glycaemia,insulin,adpocytokines,incretins) in separate alleles of *TCF7L2* SNP (p0.05). No statistical significance was found in separate *TCF7L2* alleles and MS frequency. Women with DM were observed to have higher insulin resistance(HOMA-IR 7.61±6.3) compared to women with normal glucose tolerance 2.61±1.14(p0.001), but no statistical significance was observed in separate *TCF7L2* SNP alleles. **Conclusions:** *TCF7L2* rs7903146 CT allele was seen half a more frequently in women with impaired carbohydrate metabolism. No statistical significant difference was found in separate alleles of *TCF7L2* and biochemical markers.

INTRODUCING THE WORLD ASSOCIATION OF TRAINEES IN OBSTETRICS AND GYNAECOLOGY (WATOG)

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The World Association of Trainees in Obstetrics & Gynaecology (WATOG) is a non-profit organization that represents the first worldwide network of young obstetricians and gynaecologists (OB/GYN). The association was founded at the first WATOG General Assembly (WGA) on the 7th October 2012 in Rome under the auspices of the FIGO whose officers had long wanted to find a way to mobilize the youngest members of our profession. Each of the main geographical regions, Africa, Asia, Europe, Latin America, North America and Oceania, are represented by two trainee delegates in the WATOG Executive Board. A second WGA was held in 2015 in Vancouver and the number of member countries increased to 80 by 2016. The principles of WATOG are to help trainees and young OB/GYNs to access the highest level of training, to overcome cultural barriers and to facilitate contacts and exchange between different countries. WATOG wishes to promote the foundation and sustainment of OB/GYN trainee associations at national and regional levels. During the last four years WATOG played role in the promotion and creation of 15 new OB/GYN trainee associations and/or sections within the senior associations worldwide (Mexico, Tunisia, Zambia, Zimbabwe, Nepal, El Salvador, Bolivia, Nigeria, Egypt, Russia, Sudan, Japan, Burkina Faso, Turkey, South Africa). Another mission of WATOG is to potentiate the involvement of OB/GYN trainees in global issues and women's health care in general. To this end WATOG members keep working on approaching trainees to projects proposed by large scale associations of our professions.

PECANS: WHY THEY SHOULD BE PART OF THE MEDITERRANEAN DIET

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Recent studies have demonstrated that women who adopt the nut-containing Mediterranean diet during pregnancy have a decreased risk for gestational diabetes. The tree nut species normally consumed by Europeans living in the Mediterranean region are walnuts, almonds, pistachios, hazelnuts, and pine nuts. One tree nut that is extensively cultivated outside Europe, and not classically considered to be a component of that diet, is the pecan. Pecans contain approximately 10% protein and are especially enriched in the nitric oxide-precursor amino acid, L-arginine. The fatty acid distribution of pecans is quite interesting: they are composed of roughly 60% monounsaturated fatty acids, with less saturated fats, but more polyunsaturated fats, than olive oil. The antioxidant activity of the pecan originates mostly from its phenolic constituents (*e.g.*, phenolic acids, flavan-3-ols, and tannins) and tocopherols. Pecans have the highest ORAC_{FL} antioxidant values among tree nuts, a result of their high content of phenolics (20.16 mg GAE/g), flavonoids (34.01 mg/100g), and proanthocyanidins (494.1 mg/100g). Tree nuts are recognized as excellent sources of vitamin E, (γ -tocopherol comprising over 90% of the total tocopherol profile), copper, zinc, phosphorus, and magnesium. In conclusion, pecans can be an excellent addition to the classical Mediterranean diet for pregnant women.

FETAL SIZE AND HUMAN UTERINE ARTERY BLOOD FLOW FOLLOWING MATERNAL GLUCOSE LOADING: THE EFFECT OF PLACENTAL WEIGHT

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Objectives. Uteroplacental blood flow, maternal plasma glucose levels, and the functional capacity of placental tissues are major determinants of fetal size. We here first report the effect of a maternal oral glucose tolerance test (OGTT) on uterine artery (UtA) pulsatility index (PI). Secondly we analyzed the relation between UtAPI and abdominal circumference z-score (z-AC) after adjustment for confounders including placental weight. **Material and Methods.** Using Doppler ultrasound we measured UtAPI values before (fasting state) and two hours after OGTT (75 g) at gestational week 31 in a healthy population (n=104). **Results.** There were no changes in UtAPI values (mean of right and left side) following OGTT (p=0.104). Heart rate (HR) increased (p=0.022). UtAPI and HR values were negatively correlated (p 0.001). The correlation of z-AC with UtAPI before OGTT was significant (r=-0.29, p=0.003). In a multiple regression analysis with z-AC as dependent variable and UtAPI, HR and glucose levels before OGTT, pre-pregnant body mass index, gestational weight gain and parity, the relation between z-AC and UtAPI remained significant (p=0.023), but reduced by 18 %. After including placental weight in the regression analysis the relation between z-AC and UtAPI was no longer significant (p=0.098; reduced by 44%). In an analysis including the equivalent variables after OGTT the correlation between z-AC and UtAPI was weaker (p=0.031) and non-significant (p=0.297) in the final regression model. **Conclusions.** UtAPI values were not influenced by OGTT. However, the relation between uterine blood flow resistance and fetal size was strongly influenced by placental weight.

FALSE POSITIVE AND NEGATIVE RESULTS IN DETECTION OF TRISOMY AND FETAL SEX CHROMOSOMES TESTING BY NON - INVASIVE PRENATAL SCREENING COULD NOT BE AVOID (CASE STUDY)

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Background Prenatal diagnosis in generally and non- invasive procedure testing using cell free DNA(cffDNA) in maternal plasma especially are the corner stone of the fetal wellbeing. Actually, cffDNA originates from apoptosis of placental cytotrophoblast and syncytiotrophoblast cells. Discordant results can occur due to a biological phenomenon - confined placental mosaicism (CPM), which results from the presence of cells with differing genetic compositions in the same individual - it means that chromosomal abnormality is only in cytotrophoblast or in cytotrophoblast and mesenchyme but not in amniotic fluid. **Aim** Displaying the potential contribution of CPM and other biological phenomenon in discordant results of NIPT Methods We enrolled 135 cases with different indications of using of NIPT. 5 out of 135 resulted respectively 2 with trisomy 21;1 trisomy 18, which confirmed by amniocentesis. Two other cases(both singleton pregnancies) with sonographic and maternal serum abnormalities(1) GA 29 wks with atrioventricular canal, FL Conclusion: Despite exciting advances, underlying biologic mechanisms such as confined placental mosaicism will never allow 100 % sensitivity and specificity

STATE REFERRAL CENTRE FOR DIABETES IN PREGNANCY BIOBANK

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Next to numerous biomedical disciplines, reproductive medicine is one of the important areas in academia and biomedical research where basic science, pre-clinical, translational medicine and clinical research are tightly intertwined. Consequently, in the year 2000, in the State Referral Centre for Diabetes in Pregnancy within Department of Obstetrics and Gynaecology the idea for constituting the disease focused bio bank emerged. The core of this bio bank is collection, processing, preservation of

maternal and umbilical vein and artery serum, plasma, placental tissue and placental bed biopsy from diabetic and healthy pregnancies. All samples are linked to their respective clinical data. The detailed informed consent from each patient is obtained. This mono user bio bank supports research activities of one or a group of individuals mainly for the scientific projects, clinical studies that examine the effects of modern insulin in pregnancy and deliver quality samples for PhD candidates at the University of Zagreb. At the moment the only source of funding is from scientific projects, and at no administrative cost while the personnel works on volunteer basis. The biobank is organized in several rooms within the Referral Centre and consists from: Office, Archive and PC working place, Donor/Patient area, a room for -80°C and -35°C storage, while tissue and blood work place - is part of Clinical hospital center laboratory. The protocols and quality assurance of blood and tissue collection, preparation and preservation are described in internal manual of bio bank. The ambition of this bio bank is to become the hub for diabetic pregnancy biomedical research through defining the potential end-user prospectively very early in the collecting process and to keep what we have been doing from the start and it is to stay quality focused.

ASSOCIATION OF GESTATIONAL WEIGHT GAIN WITH PSYCHOSOCIAL FACTORS AND LIFESTYLE

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Background: Inadequate gestational weight gain (GWG) is associated with adverse perinatal outcomes. **Objective:** To evaluate the relationship of GWG with modifiable, psychosocial and behavioral factors. **Methodology:** Cross-sectional observational study with postpartum women. Data were collected through a questionnaire related to psychosocial, dietary and lifestyle aspects. Obstetric and newborn data were extracted from medical records. Frequency analyzes of categorical variables and logistic regression analysis were performed using Stepwise criteria. The significance level was 5%. **Results:** Data from 215 postpartum women, with a mean age of 27 ± 6 years were collected. According to pre-gestational BMI 40.69% were eutrophic, 27.45% overweight, 26.47% obese and 5.39% underweight, and 37.25% of all women presented excessive GWR. Excessive GWG were correlated with overweight (p 0.001, OR 3.2, IC 95% 1.67-6.14), higher educational level (p = 0.011, OR 4.19, IC 95% 1.40-12.54), lower parity (p 0.026, OR 0.769, IC 95% 0.611-0.968) and newborn weight 2500g (p = 0.031, OR 6.46, IC 95% 1.18-35.33). The non-consumption of vegetables (p = 0.046, OR 2.71, IC 95% 1.02 - 7.18), as well as daily consumption of soft drinks (p = 0.039, OR 2.58, IC 95% 1.05-6.35) or sweets (p= 0.027; OR 2.40, IC 95% 1.11 - 5.19) increased the risk of excessive GWG. Psychosocial factors, smoking, sleep time and practice of physical activity showed no association with GWG. **Conclusion:** There was an association between excessive GWG, schooling, pre-gestational BMI, newborn weight and parity. Modifiable living habits such as food consumption were significantly associated with excessive GWG.

MORBIDLY OBESITY, REPRODUCTIVE FACTORS AND CONTRACEPTION: A CASE-CONTROL STUDY

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OBJECTIVE: The main goal of the study was to evaluate some reproductive factors and contraceptive method in women at reproductive age with morbid obesity. **METHODS:** A case-control study match by age (1:1) at University of Campinas, Brazil. Women with morbid obesity (case) with Body Mass Index (BMI) ≥ 40 kg/m² were selected in a Gastrosurgery outpatient clinic while looking for bariatric surgery. Women with adequate BMI (control) were selected at family planning outpatient clinic. Both groups were between 20-49 years old, not menopausal. All participants answered a questionnaire

regarding their reproductive life and contraceptive method. **RESULTS:** The mean age of women with morbid obesity (n=109) was 35.8 (SD7.5) and 35.1 (SD7.5) in control group (n=109). The mean BMI in the case group was 44.96 (SD5.33) and 23.33 (SD1.76) in control group. Women with morbid obesity presented association with early menarche (OR2.06, 95%CI 1.14-3.75) and teenage pregnancy (OR2.36, 95%CI 1.23-4.56). In the case group, five women (4%) reported not using any contraceptive method and most of the participants (n=72, 66%) were using combined oral contraception followed by intrauterine device (n=20,18%). In the control group, 10 women (9%) reported not using any contraceptive method and most of the participants (n=66, 60%) were using combined oral contraception followed by intrauterine device (n=42, 38%). The Depot medroxyprogesterone acetate was the less popular contraceptive method in both groups. **CONCLUSION:** Reproductive factors such as early menarche and teenage pregnancy are associated to morbid obesity. The combined oral contraceptive was the contraceptive method most chosen in this population.

BODY COMPOSITION AMONG ADOLESCENTS IN EARLY PREGNANCY

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Background: Inadequate gestational weight gain and a high body fat percentage (%BF) can affect perinatal outcomes. This study aims to know the body composition in early pregnancy among teens. **Methods:** Prospective cross-sectional study. Sociodemographic and reproductive data, body mass index (BMI) classified by *Institute of Medicine* (IOM-2009) and *Child Growth Standards* (CGS-2006), and %BF measured by subcutaneous adiposity (SA) and bioelectrical impedance analysis (BIA) were collected before 20 weeks of gestational age. **Results:** 87 adolescents were included with average age 15 years old (± 1.4). The mean BMI values pre-pregnancy and in the first prenatal visit were similar at 22.2Kg/m². Among the pre-pregnancy BMI 16.1% had low weight, 67.8% eutrophic, 10.3% overweight and 5.7% obesity, according to the IOM-2009, and 13.8% had low weight, 59.8% eutrophic, 18.4% overweight and 8% obesity according to the CGS-2009. Weight variation between pre-gestational and first prenatal visit was 1.7Kg (± 4.4). The mean %BF at the first prenatal visit was 31.9% (± 4.4) by SA and 28.7% (± 4.6) by BIA, with a strong correlation between both methods ($r=0.77372$). However, when categorized, both methods presented a low correlation between the girls with low weight and obesity. **Conclusion:** The measures SA and BIA showed good correlation with each other for girls with an adequate BMI, and should be used for adequate nutritional evaluation of %BF in early pregnancy among adolescents who were mostly classified as eutrophic by BMI, but presented a high %BF. Added to this, no specific recommendations for pregnant adolescents could affect the interpretation of the results.

DIETARY PROFILE AMONG ADOLESCENTS IN EARLY PREGNANCY

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Background/Objective: High nutritional needs and inadequate diet can affect perinatal outcomes among adolescents. This study aims to know the dietary profile in early pregnancy among teens. **Methods:** Prospective cross-sectional study. Sociodemographic and reproductive data, 24 hours dietary recall, body mass index (BMI) and body fat percentage (%BF) measured by subcutaneous adiposity (SA) and bioelectrical impedance analysis (BIA) were collected before 20 weeks of gestational age. **Results:** 87 adolescents were included with average age 15 years old (± 1.4) and BMI 22.9Kg/m² (± 4.2). Weight variation between pre-gestational and first prenatal visit was 1.7Kg (± 4.4). The mean %BF was 31.9% (± 4.4) by SA and 28.7% (± 4.6) by BIA. The average energy consumption was

116.8% (± 281.2) of daily recommendation (1805.5 Kcal/day; ± 67.2). Carbohydrate and lipid were an excessive intake in 36.8% and 31% respectively. Iron and folate intake were below the recommended in 98.9%, and their supplementation were used respectively in 45% and 18%. Calcium intake was below the recommended in 94.3%. Protein and zinc consumption were negatively correlated with %BF by both methods ($r = -0.3096$ and $r = -0.2363$). Conclusion: Pregnant adolescents present a eutrophic BMI with high %BF, which can be related with the high consumption of carbohydrate and lipid, and with the low consumption of protein. Pregnant adolescents also had low consumption of iron, folate and calcium, and then the supplementation of these micronutrients is mandatory during teenage pregnancy. These results show the importance of multidisciplinary prenatal care for pregnant adolescents, which may be the key to reducing adverse neonatal outcomes.

CHOLESTEROL UPTAKE AND EFFLUX IS ALTERED IN TROPHOBLAST AND MICROVASCULAR ENDOTHELIAL CELLS FROM HUMAN MATERNAL SUPRAPHYSIOLOGICAL HYPERCHOLESTEROLEMIC PREGNANCIES

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Maternal to fetal cholesterol traffic occurs in placenta by trophoblast uptake of maternal HDL and LDL [via scavenger receptor class B type I (SR-BI) and LDL receptor (LDL-R)]. Cholesterol efflux to microvascular endothelial cells (hPMECs) and fetal lipoproteins occurs via ATP-binding cassette sub-family G member 1 (ABCG1). Maternal physiological hypercholesterolemia (MPH) occurs in pregnancy assuring fetal development, but maternal supraphysiological hypercholesterolemia (MSPH) leads to endothelial dysfunction and fetal atherosclerosis. Whether MSPH changes (1) receptor-mediated cholesterol uptake or (2) efflux in placental cells is unknown. Methods: Pregnant women with total cholesterol 280mg/dL were considered as MSPH. Placental trophoblast and hPMECs were isolated by enzymatic digestion. HDL and LDL were purified by ultracentrifugation and labeled with DiI. Cholesterol uptake was estimated in trophoblasts incubated with HDL-DiI and LDL-DiI (0-50 $\mu\text{g/mL}$, 4 h). Cholesterol efflux was determined in cells pre-incubated with [³H]cholesterol and later incubated with HDL (50 $\mu\text{g/mL}$, 6 hours). Protein abundance of SR-BI, LDL-R and ABCG1 was evaluated by western blot. Results: Compared with trophoblasts from MPH: (1) HDL-DiI and (2) LDL-DiI uptake was lower in MSPH (42 ± 7 and $37 \pm 4\%$, respectively). (3) Cholesterol efflux or (4) abundance of SR-BI was unchanged. (5) Abundance of LDL-R and (6) ABCG1 was reduced (80 ± 5 and $73 \pm 10\%$, respectively) ($P < 0.05$, $n = 6$). Compared with hPMECs from MPH: Cholesterol efflux was increased ~ 1.65 fold in MSPH without changes in ABCG1 ($P < 0.05$, $n = 4$). Conclusion: MSPH is a maternal condition that could decrease cholesterol uptake by trophoblast and increase cholesterol efflux in the placental microvasculature to the fetal circulation. FONDECYT 1150344/1150377/11150083.

USE OF FETAL WEIGHT PERCENTILE AS A PREDICTIVE FACTOR TO INCREASE EFFICIENCY IN CORD BLOOD DONATION PROGRAMS

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BACKGROUND: The success of an allogenic transplantation of Umbilical Cord Blood (UCB) is mostly determined by the number of total nucleated cells (TNC). In our environment, particularly in the Banc de Sang o Teixits (BST), it is considered that a unit of UCB is acceptable when the weight of the collected unit exceeds 110gr, the TNC is 1500×10^6 or CD34+ cells are 4×10^6 . So far, public UCB donation has been done universally, but based on the study of a historical control group, only 30% of collected units meet the criteria to be transplanted. Many obstetrical factors have been linked to the quality of UCB, being the weight of the fetus and the placenta the ones that are more correlated with it. Fetal weight can be estimated by ultrasound and it will follow a trend until the time of delivery.

OBJECTIVE: To establish the fetal weight and growth percentile from which a sample of UCB will meet the quality criteria in order to increase the efficiency of UCB donation programs. **METHODS:** Retrospective analysis of 11349 cord blood units. An analysis of diagnostic efficiency was performed establishing the cutoffs of fetal weight and percentile from which we should obtain a UCB unit which is considered optimal. **RESULTS:** A birth weight of 3302.5 grams and a fetal percentile 60th predict equally a TNC 1600×10^6 (100×10^6 greater than the limit set by the BST) and CD34 4×10^6 .

CONCLUSION: Selecting antenatally donors with fetal weight percentiles above 60 can increase UCB donation programs efficiency.

EXTERNAL CEPHALIC VERSION TO REDUCE CAESAREANS AT IZOLA MATERNITY HOSPITAL

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Background: Almost all babies in breech presentation at term are delivered by caesarean section. Professional guidelines recommend an attempt of external cephalic version to reduce breech presentations at birth and thus the proportion of caesareans. Our aim was to analyze the clinical and ultrasound factors to predict the outcome of version and check the hypothesis, if the implementation of the external cephalic version helps to reduce the number of caesareans. **Methods:** The study included all attempts of external cephalic version after 36 weeks of pregnancy at the Department of Obstetrics and Gynecology in Izola General Hospital from 2002 to 2010. **Results:** 68/143 (47.6 %) external cephalic versions were successful. The success of intervention was mostly affected by a greater amount of amniotic fluid, higher fetal position in the pelvis and transverse or oblique lye of the fetus. With 100 attempts of external cephalic version 32 caesareans were avoided or one caesarean with 3.1 attempt. **Conclusions:** The study confirmed that performing external cephalic version the number of caesareans can be reduced. The proportion of successful versions was comparable to studies in the literature despite minimal use of uterine muscle relaxants.

MALE INFERTILITY IN TYPE 1 DM

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Background: The rising incidence of DM worldwide has resulted in an increased prevalence in men of reproductive age. The vast majority (90%) of patients with type-1 diabetes are diagnosed before the age of 30. DM may affect male reproductive function at multiple levels as a result of its effects on the

endocrine control of spermatogenesis, impairing penile erection and ejaculation. Despite this, studies examining the effects of DM on sperm fertility potential have been limited. Objective: To study the difference, if any, in semen, quantitative and qualitative, in men with and without diabetes, using the light microscopy. Methods: Conventional semen analysis, core method to evaluate male fertility in the clinical setting was performed (semen volume, sperm count, motility and morphology) using light microscopic method. In all 30 subjects, 14 diabetic (mean age 30 ± 3.4 years) and 16 non-diabetic subjects (control group, healthy men with no fertility concern, already fathered a child, mean age 30 ± 3.8 years) were included. Results: Significant reduction in semen volume in diabetic men (1.8 versus 3.7 ml; $P = 0.005$) was found. Total sperm count was reduced (41×10^6 versus 74×10^6 ; $P = 0.0001$) and the number of motile sperms was also reduced (37% versus 84%; $P = 0.0001$). Besides, the morphology of the motile sperms was altered as well (11% normal versus 87%; $P = 0.0001$). CONCLUSIONS: Diabetes is associated with decreased semen volume, decreased sperm count and motility, and altered sperm morphology that may impair the reproductive capability of these men.

DOES A STANDARD BREAKFAST MEAL INFLUENCE FETAL BLOOD VELOCITY WAVEFORMS IN THIRD TRIMESTER?

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Objectives: Studies have shown that a glucose tolerance test may influence fetal middle cerebral artery (MCA) velocity waveforms with a reduction in the pulsatility index (PI). The present study was performed to examine the impact of a standard breakfast meal (SBM) representing a more physiological setting on MCA PI values. Methods: Eighty-nine low-risk Caucasian women, with singleton pregnancies were included. Doppler measures of umbilical artery (UA) PI, MCA PI and fetal heart rate (FHR) were performed in gestational week 30 and 36. The examination in the fasting state was performed at 08.30 am followed by a SBM. The same examination was repeated 110 min later. Δ MCA PI, Δ UA PI and Δ FHR for each fetus was calculated as values after minus values before the meal. Results: All PI values were negatively correlated with FHR. The PI values were adjusted for FHR by using a linear regression model. After the SBM MCA PI was significantly reduced; -0.087 ($p = 0.04$) and -0.194 ($p = 0.001$) in week 30 and 36, respectively. Δ MCA PI was non-significantly lower in week 36 than week 30 (-0.113; $p = 0.075$). The SBM did not give any significant influence on UA PI values in week 30 ($p = 0.25$) or 36 ($p = 0.92$). Conclusion: Independent of FHR fetal MCA PI decreased after a SBM both in week 30 and 36. The decrease in MCA PI was non-significantly related to gestational age. We found no significant change in UA PI values.

THE INFLUENCE OF GLUCOSE VERSUS A STANDARD BREAKFAST MEAL ON FETAL MIDDLE CEREBRAL AND UMBILICAL ARTERY PULSATILITY INDICES.

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Objectives: Studies have shown that a glucose tolerance test (GTT) may influence fetal middle cerebral artery (MCA) velocity waveforms, with a reduction in the pulsatility index (PI). Our aim was to compare two groups, one receiving a standard breakfast meal (SBM) and one having a GTT. The data from the GTT group have recently been published (1). Methods: The GTT and SBM group

comprised 105 and 116 Caucasian women with low-risk singleton pregnancies, respectively. Doppler measures of umbilical artery (UA) PI, MCA PI and fetal heart rate (FHR) were performed in gestational week 30. Δ MCA PI, Δ UA PI and Δ FHR for each fetus were calculated as values after minus before the SBM or GTT. Results: Some PI values were negatively correlated with FHR, they were all adjusted for by using a linear regression model. MCA PI was significantly reduced in both the SBM group (-0.078; p=0.037) and the GTT group (-0.24; p0.001) with a significant difference between the groups (p=0.026). UA PI did not change significantly in either of the groups. Conclusion: Independent of FHR fetal MCA PI decreased in both the GTT and the SBM group. The reduction was a significantly larger in the GTT group compared to the SBM group. We did not find any significant changes in the UA PI values in either group. Haugen G. et al. Acta Obstet Gynecol Scand 2016;95:683-689.

NEW ONSET OF GUILLAIN-BARRE SYNDROME IN POSTPARTUM PERIOD FOLLOWING CAESAREAN SECTION UNDER SPINAL ANAESTHESIA

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Background Guillain-Barré syndrome (GBS) is a rare autoimmune disorder caused by demyelination and axonal degeneration resulting in acute polyradiculoneuropathy. The incidence of GBS in pregnancy is 6-24 cases per 100,000 and carries a higher maternal morbidity and mortality. Case presentation A 36-year-old Pakistani woman, para 3 presented to the emergency unit in CUMH 19 days post her elective caesarean section with bilateral leg weakness and unsteady gait as well as slight numbness on the sole one week post-surgery. Neurology consult was requested and her nerve conduction study revealed findings consistent with GBS. She received IVIG of 0.4g/kg for 5 days and physiotherapy. Symptoms improved and she was discharged home with neurology outpatient clinic follow-up. Discussion Guillain-Barré syndrome does not influence the nerve conduction for uterine contraction and cervical dilation, hence vaginal delivery is permissible. Vacuum extraction may be required as the ability to bear down is weakened. GBS can occur at any stage of the pregnancy but the incidence is increased in the third trimester and 2 weeks postpartum. GBS is commonly presented as progressive symmetrical weakness starting from lower extremities in ascending pattern, areflexia, paraesthesia or neuropathic pain. Laboratory and electrophysiological investigation for the diagnosis of GBS is often non-specific. Lumbar puncture, antibody screening, electrocardiogram and nerve conduction study are included to diagnose GBS. GBS is treated with 400mg/kg of IVIG for 5 days or immunomodulation with plasmapheresis. Conclusion GBS is a very rare disorder seen in obstetrics field and multidisciplinary approach is warranted for a better outcome.

DOES ANGIOTENSIN CONVERTING ENZYME GENE INSERTION/DELETION POLYMORPHISM HAS SIMILAR CONTRIBUTION TO THE METABOLIC DISTURBANCES IN PCOS AND IN TYPE 1 DIABETIC PATIENTS?

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The aim was to analyse the frequency of ACE I/D gene polymorphisms in women with PCOS, type 1 diabetes (T1DM) and the presence of metabolic complications. 110 PCOS patients, 109 T1DM and 138 volunteers were enrolled. The median age was 27.0(24.0-30.0), 27.0(25.0-32.0) and 28.5(26.0-31.0) years, respectively ($p=0.07$). PCOS was confirmed according to the Rotterdam consensus criteria. Controls included volunteers with regular menstruation, no hyperandrogenism, or other endocrinopathies. The following criteria were used to divide the patients as metabolically unhealthy(MU) and metabolically healthy(MH): obesity, hypertension, dyslipidaemia, impaired glucose tolerance (PCO and control). The II, ID, and DD frequencies were 5.1, 37.7, 57.3% in PCOS, 29.1, 44.5, 26.4%, in controls and 33.6, 36.4, 29.1% in diabetics. There were significant differences in frequencies of ACE genotypes between controls and PCOS ($p<0.00001$, $p=0.27$, $p<0.002$). Comparison between T1DM and PCOS shows differences in II and DD ($p<0.00001$), between diabetics and controls there were no differences. There was a significantly higher prevalence of the DD genotypes in the PCOS compared with the controls, irrespective of the presence of metabolic risk factors (OR, 3.87; $P=0.0003$), cardioprotective II genotype occurred in PCOS less frequently (OR, 0.4; $P=0.06$). In the diabetic group we didn't find any significant relations between genotypes and metabolic parameters. ACE polymorphism may serve as factor predisposing to the presence and intensity of metabolic disturbances in women with PCOS. Although in T1DM genotype distribution is significantly different, other factors seem to play dominant role in development of metabolic complications.

SURGICAL PROCEDURE OF ADNEXAL MASSES IN PREGNANCY

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Objective: Review of cases of adnexal masses detected during pregnancy. **Material and method:** Observational, descriptive and retrospective study is carried out in 34 pregnant women diagnosed with adnexal mass during pregnancy in the last four years in our centre using IOTA GROUP echographical criteria. **Results:** ultrasounds allowed for the characterisation of 76% of tumors, being the use of MRI necessary in the rest of the cases to categorise correctly the adnexal mass under study. Surgery is indicated in cases with a high suspicion of malignancy or in symptomatic patients and must be performed by experienced staff and preferably in the second term (16-18 week), being laparoscopy the surgical procedure to perform. In 3 out of the 34 cases surgery was indicated and performed during gestation.

Surgery was successfully performed and full-term delivery was achieved in all the cases. The results of post-surgical pathological anatomy were teratoma, cystic endometriosis and bilateral teratoma with component of struma ovarii. Surgery was performed in weeks 16, 21 and 18, respectively. **Conclusions:** The application of IOTA echographical criteria allows for the categorisation with a high NPV of adnexal lesions, as long as it is performed by a trained echographer. It is important the detection of these lesions in early echography since the best moment to perform a minimally invasive surgery is before 24 weeks of pregnancy, due both to hemodynamic characteristics and to possible complications on the fetus or on the pregnant woman.

USE AND RISK PERCEPTION OF TOBACCO VERSUS ELECTRONIC NICOTINE DELIVERY SYSTEMS IN PREGNANCY

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Background: Given the rapid rise in availability and use, understanding the perception of Electronic Nicotine Delivery Systems (ENDS) compared to tobacco in pregnant women is vital to more effective education and screening to improve maternal and fetal outcomes. **Objective:** To investigate the use of tobacco cigarettes and ENDS, risks perceptions, and ENDS knowledge in a convenience sample of pregnant women. **Study Design:** A cross-sectional survey study was conducted utilizing a 32-item, self-administered survey between May-July 2015. Demographics including age, race, education, and gestational age were also collected. Associations of perceptions and user status were explored using Chi-square or Fisher's exact tests. **Results:** A total of 382 participants were analyzed. The majority of participants were 21-29 years old (57.9%) and had a high school education (82.4%). 62.7% reported using ENDS and/or tobacco cigarettes, and 30.3% reported using both. 11.9% were categorized as current ENDS users (CEU), 19.1% were former ENDS users (FEU), and 69% had never used ENDS (NEU). CEUs and FEUs were more likely to agree that ENDS can help them to quit tobacco smoking compared to NEUs (means: 3.61 and 3.25 vs. 3.06, $p=0.009$). The majority of participants reported that their providers didn't assess their ENDS use. **Conclusions:** The study found a relatively high proportion of pregnant women using ENDS and tobacco cigarettes. CEUs and FEUs perceived lower health risks of using ENDS. Promoting awareness of the risks of ENDS in pregnancy among the public and healthcare providers is warranted.

CHANGES IN BODY PROPORTIONS AND COMPOSITION FROM PRE-CONCEPTION TO EARLY PREGNANCY

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Background. It is a common assumption that weight and BMI are the same during the first trimester as before pregnancy, but there are hardly any studies that provide data on woman's body composition and proportion from preconception to the first trimester. We hypothesize that there are changes in the early stage of pregnancy. **Method.** This is a part of CONIMPREG research program, which is a prospective, longitudinal, observational study, recruiting healthy women aged 20-35 with BMI 18.5-30 and regular menstrual cycle, and who intend to become pregnant. We measured height, weight, BMI, fat mass and circumference of overarm and skinfold measurements at inclusion and at 13 weeks of pregnancy. Changes were tested using paired t-test. The effect of age and parity on change in lean body mass was assessed using linear regression and adjusted for lean body mass at inclusion. **Results.** Of the 160 recruited participants 79 became pregnant, but nine missed the 13th week measurement. Compared with preconception, there was a significant increase in weight (1.07kg, 95%CI 0.6–1.5), BMI (0.37, 0.21–0.54), and fat (1.8kg, 1.3–2.2), no significant changes in skinfold, but lean body mass declined (-0.7kg, -0.32 – -1.08). A one year increase in maternal age was associated with 0.18kg (0.05-0.30) less decrease in lean body mass after adjustment for parity and baseline. **Conclusion.** There was a modest but significant increase in maternal weight, BMI and body fat in the first trimester compared with preconception. However, lean body mass decreased significantly, and more in the younger women.

CYTOMEGALOVIRUS CONGENITAL INFECTION. INCIDENCE AND CLINICAL MANIFESTATIONS.

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Introduction: Cytomegalovirus is the most common cause of intrauterine infection, and is a common cause of sensorineural hearing loss and mental retardation. **Method:** We review the cases CMVc from January 2009 to December 2016. The diagnosis in the prenatal period was made by PCR (Entherpex) in amniotic fluid sample or chorionic villous sample and /or maternal serological test. The diagnosis at birth was made by virologists culture (2009-2014) or real time PCR (2015-2016) in urine at the first week of live, in all the new born with ultrasound markers of CMV infection, suggestive clinic or in 72 hours in asymptomatic babies of HIV-positive mothers. **Results:** We have found 22 cases of CMVc, 9 in prenatal period and in 13 cases in the perinatal period. In 9 of the cases with prenatal diagnosis, 2 of them without absence of sonographic findings and they born asymptomatic. In 7 cases termination of pregnancy was made. The incidence was 0,39/1000 live born. Of the 15 newborn with CMVc, 5 (33,3%) were asymptomatic, and 10 (66,7%) symptomatic. The main symptoms were: prematurity (46,7%), IUGR (26,7%), purpura (13,3%), intracranial calcifications (6,7%) and meningitis (6,7%). From 10 of the symptomatic babies, 7 (70%) received treatment with ganciclovir and/or valganciclovir. 4 (26,7%) newborn had sequelae, 2 (13,3%) hipocusia and psychomotor delay, one (6,7%) sensorineural hearing loss, cognitive delay and hemiparesis and one (6,7%) cataracts bilateral. **Conclusions:** The prematurity and the IUGR are the main clinical manifestations.

MATERNAL BRAIN TUMOUR WITH BRAINSTEM COMPRESSION AT 24 WEEKS GESTATION

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A 38 year-old woman was referred at 24 weeks gestation for suspected left Bell's palsy. This was a singleton pregnancy conceived via in-vitro fertilization. She had good past health apart from endometriosis. She suffered from left blurring of vision, left facial numbness, slurring of speech and occasional choking for one month. Physical findings included partial left third and fifth cranial nerve palsy and tandem gait. MRI brain showed 4cm left petroclival tumour with brainstem compression. She was operated at 25 weeks gestation and intraoperative biopsy showed benign meningioma. The tumour was completely resected. Repeated MRI showed no residual tumour and brainstem well decompressed. The remaining antenatal course was uneventful and she delivered a healthy baby vaginally at 39 weeks gestation.

There were only case series describing neurosurgery in pregnant patients. Multidisciplinary approach with good communication played crucial role in the management of pregnant patient with brain tumour and brainstem compression at gestation just reached fetal viability. Early operation was necessary because of brainstem compression. Delivery before operation was not advisable because of extreme prematurity. Concerns included anaesthetic agents, positioning, perioperative medications, haemodynamic stability, intra-operative fetal monitoring. This patient was put in right lateral tilt and her head was turned right on head-holder. Total intravenous anaesthesia was used. Hyperventilation was avoided to preserve uteroplacental circulation. Levetiracetam and dexamethasone were started before operation and continued for a week after. Low dose mannitol 0.6-1.1g/kg was used. Fetal assessment by ultrasound and Doppler was performed before and after operation.

MYO-INOSITOL AND PROBIOTICS SUPPLEMENTATION REDUCES FAT ACCRETION IN FEMALE RATS AT RISK OF METABOLIC DISEASE

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Introduction. Higher maternal pre-pregnancy BMI increases mother and offspring's cardiometabolic risk. The effects of myo-inositol or a mix of *Bifidobacterium Lactis* CNCM I-3446 (B12) and *Lactobacillus rhamnosus* CGMCC1.3724 (LPR), alone or in combination on body weight and body

composition were evaluated in a rat model prone to develop T2 Diabetes. Methods. Female Goto-Kakizaki (GK) rats (n=20 per group) were randomly allocated to receive ad libitum quantities of a semi-purified diet (AIN93-G) alone (Control) or supplemented with either myo-inositol (1%), probiotics (LPR and B12 at 10^9 CFU/day each) or myo-inositol + probiotics (1% and 10^9 CFU/day, respectively). Body weight (BW) and body composition were measured at baseline and after 10 weeks of dietary treatment. Results. After 10 weeks of treatment, no differences were detected in fat mass or lean mass gain between Myo-inositol or Probiotics groups when compared to the Control group. However, absolute fat gain was significantly lower (25.3 vs. 29.8 g; P0.05) in those animals receiving Myo-inositol + Probiotics when compared to Control group. This resulted in a lower change in fatness (+6.8 vs +8.5 %; P0.05) and greater relative lean mass (68.3 vs 66.4 % of BW; P0.05) at the end of the experiment in the animals supplemented with this mix. Conclusion. Our results suggest that a combination of myo-inositol and probiotics is more effective to decrease fat accretion than either ingredient alone. This combination could be a pre-pregnancy nutritional strategy to reduce the risk of metabolic conditions in pregnancy such as gestational diabetes mellitus, in women at risk.

THE EFFECTS OF THE BILE ACID TUDCA ON PANCREATIC α AND β CELLS LINE EXPOSED TO METABOLIC SYNDROME ENVIRONMENT

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Introduction: Bile acids are signaling molecules that regulates lipid and glucose metabolism. Some bile acids act as chaperones, reducing endoplasmic reticulum (ER) stress and improving cell survival and viability in metabolic syndrome. ER stress is involved in obesity and malnutrition damage, impairing pancreatic α and β cell and contributes to Diabetes type 2 development. However, the contribution of bile acids on this process is unknown. **Aims:** Investigate the effects of the taurine-conjugated bile acid TUDCA on α and β cells exposed to ER stress. **Methods:** α -TC1-9 cell line were treated 48 hours with the ER stressor Cyclopiazonic (CPA) and 50 μ M TUDCA (CPA + T). For β cell, INS-1E cell line were exposed 48 hours to a medium poorly of aminoacids and 50 μ M TUDCA. **p0.05** for all results. **Results:** CPA treatment reduce glucagon secretion (8827 ± 1102 CON x 2609 ± 501 /pg.ug protein CPA) and increases gene expression of ER stress markers BIP (1.03 ± 0.08 x 3.42 ± 0.07), CHOP (1.03 ± 0.1 x 2.72 ± 0.6) and ATF4 (1.04 ± 0.1 x 1.55 ± 0.1). TUDCA restore glucagon secretion (2609 ± 501 CPA x 5577 ± 850 /pg.ug protein CPA + T) and reduces the gene expression of ER stress markers BIP, CHOP and ATF4 (3.42 ± 0.07 x 2.39 ± 0.55 ; 2.72 ± 0.6 x 1.70 ± 0.15 ; 1.55 ± 0.15 x 0.99 ± 0.13 , CPA x CPA+T). In INS-1E cells, the exposition to malnutrition medium increase ER stress markers ATF4 and BIP. However, TUDCA treatment have no effect in this parameter **Conclusion:** Pancreatic α and β -cell are susceptible to ER stress. 50 μ M TUDCA treatment just prevents ER stress in pancreatic α -cell. **Financial Support:** FAPESP and Cnpq

LIPID PROFILE, GLUCOSE AND HOMOCYSTEINE LEVELS IN PREGNANT WOMEN FROM THE CRIBS STUDY - THE PRELIMINARY REPORT

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The intrauterine environment affects fetal growth and development. Healthy women with no history of chronic diseases, who conceived naturally and had singleton pregnancies have been participating in the Croatian Islands' Birth Cohort Study (CRIBS), an ongoing project in the Eastern Adriatic, Croatia, aiming to assess the prevalence of risk factors for the Metabolic Syndrome. Fasting blood lipids (total-Chol, Trig, HDL-Chol and LDL-Chol), glucose and homocysteine levels were determined in 94 pregnant women (taken between 22th and 26th week of gestation). We investigated their association with possible predisposing factors (age, gestational age, level of education, obesity and smoking status), newborns' anthropometric measures (weight, length and head circumference) and with adverse pregnancy outcomes (pre-eclampsia, preterm birth, small/large for gestational age). Among the blood lipids, the largest divergence was found in triglyceride levels (mean 4.2±1.1, range 0.9-11), with elevated values (1.7 mmol/L) present in 75% of the examinees. Smokers, in comparison to non-smokers, had significantly lower HDL-Chol levels and women older than 30 years had significantly higher total-Chol than younger ones. Women with higher mean glucose levels (but within the normal range) gave birth to children with significantly higher weight-at-birth z-standardized according to WHO, and women with low homocysteine levels (The modification of lifestyle during the pregnancy might help in regulating blood lipids, glucose and homocysteine levels, what would in return positively affect the body size of newborns).

Placental Insufficiency (Preeclampsia and Fetal Growth Restriction)

CONTROLLING THE FATE OF PREECLAMPSIA BY MODULATING HYPOXIA INDUCIBLE FACTORS AND THEIR REGULATORY PROTEINS

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Chronic fetal asphyxia caused by impaired placental blood flow is associated with preeclampsia and fetal growth restriction, two common and serious disorders of human pregnancy. Chronic fetal asphyxia is associated with 30% of all preterm births and presents a clinical dilemma where both intervention and non-intervention may result fetal brain injury.

Hypoxia Inducible Factors (HIFs) are master regulators of the response to low cellular oxygen. HIF alpha subunit proteins contribute to embryonic development and to the pathology of diseases associated with hypoxia. Hypoxic stimuli, induces nuclear translocation of HIF to bind the hypoxia response element (HRE) for transcription of target genes that play pivotal roles in erythropoiesis, angiogenesis (VEGF), glucose transport (GLUT) and glycolysis, proliferation and apoptosis.

HIFs also regulate placental vascularization and trophoblasts (fetal cells) invasion and differentiation essential to placental development. Oxygen is essential for placental function and fetal growth. The first trimester of pregnancy, accompanied with early placental and embryo differentiation, occurs in a

low oxygen environment. At the end of the first trimester, the trophoblasts plugged to the arterioles are dislocated, allowing maternal blood to flow more freely, while differentiated at higher oxygen tensions. The delicate oxygen balance during normal pregnancy and following pregnancies complications, challenged us in exploring HIFs regulations within the placenta and the developing embryo - in health and disease.

We believe that exploring HIFs cellular pathways along the placental areas, may not only contribute to a better understanding of pregnancies complications, but may also shed a light on new possible therapeutic approaches.

FETAL GROWTH AND PRETERM BIRTH RATES IN SINGLETON PREGNANCIES CONCEIVED BY NATURAL CYCLE AS COMPARED WITH CONVENTIONAL IVF AND SPONTANEOUSLY CONCEIVED PREGNANCIES

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Aim: Worse perinatal outcomes associated to in vitro fertilization (IVF) could be related to infertility *per se*, laboratory procedures and/or effects of ovarian stimulation. Natural cycle (NC) IVF permits to investigate the effect of IVF avoiding ovarian stimulation. Our objective was to assess the impact NC IVF on perinatal outcomes. **Methods:** Retrospective cohort study of singleton live births born from 2006 to 2016 in pregnancies obtained by NC IVF ($n=71$), conventional IVF ($n=659$), SC pregnancies in infertile (SC-I, $n=194$) and fertile (SC-F, $n=136$) couples. NC and conventional IVF pregnancies were obtained after a fresh transfer of cleavage stage embryos. Statistical comparisons were adjusted by maternal age. **Results:** While IVF presented lower birthweight, NC showed similar birthweight (SC-F 3398g (394) vs SC-I 3260g (513) vs NC 3278g (493) vs IVF 3125g (517)*, $p=0.001$), birthweight centile (SC-F 50% (27) vs SC-I 55% (32) vs NC 51% (33) vs IVF 43% (31), $p=0.004$) and prevalence of low birthweight (SC-F 0.7% vs SC-I 7.2% vs NC 7% vs IVF 10.3%, $p=0.004$) as compared to SC. All infertile groups were associated with lower gestational age at delivery (SC-F 40.0 weeks (1.2) vs SC-I 39.0 weeks (3.1)* vs NC 39.3 weeks (1.4)* vs IVF 39.0 weeks (1.9)*, $p=0.001$) and higher prevalence of prematurity (SC-F 0.7% vs SC-I 5.7% vs NC 4.2% vs IVF 7%, $p=0.04$). **Conclusions:** This study shows preserved fetal growth in NC compared to conventional IVF. Future studies are warranted to better define the potential beneficial effect on perinatal outcomes associated to NC IVF.

PERFORMANCE OF FIRST TRIMESTER SCREENING IN PREDICTING SMALL FOR GESTATIONAL AGE NEONATES AND FETAL GROWTH RESTRICTION

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Objective: To assess the different performances of an integrated first trimester screening to predict small for gestational age neonates (SGA) and fetal growth restriction (FGR). **Methods:** A nested-case control study from a prospective cohort of singleton pregnancies underwent routine first trimester screening. SGA was defined as a birth weight (BW) 10th percentile; FGR was defined as an ultrasound estimated fetal weight (EFW) 10th percentile plus Doppler abnormalities, or BW 3rd percentile. Logistic regression-based predictive models were developed for predicting SGA and FGR. The models included the a priori risk (maternal characteristics), mean arterial pressure (MAP), uterine artery (UtA) Doppler, placental growth factor (PlGF) and soluble Fms-like tyrosine kinase-1 (sFlt-1). **Results:** Of the 9150 newborns, 979 neonates (10.7%) were SGA and 462 fetuses (5%) were growth-restricted. There was a significant difference in the final model for the prediction of SGA and FGR: AUC (95% CI) of 0.68 (0.66-0.70) vs. 0.78 (0.75-0.81), respectively (p<0.001). For the prediction of SGA, detection rate (DR) was 35% and 42% for a false positive rate (FPR) of 5% and 10%, respectively. The predictive performance for FGR was significantly higher as compared with SGA (p<0.001), with DRs of 59% and 67%, for FPR of 5% and 10% respectively. In particular, the angiogenic factors improved the prediction of FGR by 20%. **Conclusions:** This study established the superior performance of a specific risk algorithm for FGR, as compared with a neonatal definition based on birth weight. The angiogenic factors added predictive ability for FGR in first trimester screening.

PREGNANCY AND NEONATAL OUTCOME, AND PLACENTAL PATHOLOGY IN RELATION TO THE SEVERITY OF FETAL GROWTH RESTRICTION

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Objective: To investigate neonatal adverse outcome and placental component in pregnancies complicated with fetal growth restriction (FGR) in relation to their growth. **Study Design:** Pregnancy and neonatal outcome, and placental pathologies from FGR neonates, between 24-42 wks of gestation, during 2010-2015, were reviewed. Results were compared between neonates with birth-weight $\leq 5^{\text{th}}$ %, severe FGR, (S-FGR group) and neonates with birth-weight at 5th-10th%, mild FGR, (M-FGR group). Placental lesions were classified as maternal and fetal vascular malperfusion lesions and inflammatory responses. **Results:** Mean birth-weight was 2328 \pm 411 grams of the M-FGR group (n=211) and 2056 \pm 477 grams of the S-FGR group (n=292). Gestational age was similar between the groups, 37.8 \pm 2.4 vs. 37.6 \pm 2.9 wks, p=0.28, respectively, with similar cesarean section rate of 55.5% vs. 56.8%, respectively, p=0.48, and pregnancy complications rate. Doppler flow studies were performed to 19% and 24.3% of the M-FGR and S-FGR groups, respectively. Pathological Doppler flow studies did not differ between the groups. Composite adverse neonatal outcome, defined as one or more of early complications, was worse in the S-FGR group as compared to the M-FGR group, p<0.001. Lower placental weights, 329 \pm 84 vs. 368 \pm 79 grams, p<0.001, with higher rate of maternal placental malperfusion lesions known as decidual arteriopathy, were observed in the S-FGR group as compared to the M-FGR group, 12.8% vs. 6.7%, respectively, p<0.026. **Conclusion:** Lower placental weights and more maternal placental malperfusion lesions were correlated with the severity of the FGR. These findings probably associate with worse placental function that contributes to worse neonatal outcome in severe FGR.

CHANGES IN DIASTOLIC BLOOD PRESSURE UNTIL MID-GESTATION AND RISKS OF PREECLAMPSIA AND SMALL-FOR-GESTATIONAL-AGE BIRTH. A SWEDISH POPULATION-BASED STUDY OF LOW RISK PRIMIPAROUS WOMEN.

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Objective: Gestational hemodynamic adaptations, including lowered blood pressure (BP) until mid-gestation, might benefit placental function. We hypothesized that an increase in diastolic BP from early to mid-gestation increases risks of preeclampsia and small-for-gestational-age (SGA) birth, and that the risks may differ by level of early gestation BP.

Methods: In 64,617 healthy primiparous women, we estimated risks of preeclampsia and SGA birth depending on the change in diastolic BP from early to mid-gestation, categorized into lowered, unchanged and elevated diastole. Risks were estimated by logistic regression, presented with adjusted odds ratio (AOR) and 95% confidence intervals (CI).

Results: Compared with women with lowered diastole, the risk of preeclampsia and SGA birth increased with elevated diastole (5 mm Hg) from early to mid-gestation. The risks were highest for preterm (37 weeks) disorders with AORs 1.9 (95% CI 1.5 – 2.5) for preeclampsia and 2.0 (95% CI 1.5 – 2.8) for SGA. There was an interaction between early-gestation diastole and change in diastole until mid-gestation concerning risks of preeclampsia and SGA birth (both with $p < 0.05$). The risk effects of elevated diastole seemed stronger in women with high (80-89 mm Hg) than low (70 mm Hg) early-gestation diastole. The rate of preeclampsia in women with early-gestation diastole 70 mm Hg and lowered diastole until mid-gestation was 1.7%, compared to 14.3% in those with early-gestation diastole 80-89 mm Hg and elevated diastole until mid-gestation. **Conclusion:** The results indicate that early gestation diastole and change in diastole until mid-gestational interact on risks of preeclampsia and SGA birth.

ANGIOGENIC PROFILE AND SMOKING IN THE FINNISH GENETICS OF PREECLAMPSIA CONSORTIUM (FINNPEC)

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Background: The biological mechanism by which smoking reduces the risk of pre-eclampsia (PE) is not well established.

Objective: We studied first and third trimester serum levels of soluble fms-like tyrosine kinase 1 (sFlt-1), placental growth factor (PlGF) and soluble endoglin (sEng) in the Finnish Genetics of Preeclampsia Consortium (FINNPEC) to ascertain whether these factors are altered in mothers who smoke. **Patients and Methods:** First trimester serum samples were available from 217 women who later developed PE and 238 women who did not have PE. Third trimester serum samples were available from 174 pre-eclamptic and 54 non-pre-eclamptic women. Women were further divided into subgroups based on their smoking status (current smokers/pre-pregnancy smokers/non-smokers). Concentrations of sFlt-1 and PlGF were measured by electro-chemiluminescence immunoassays

(ECLIA, Roche Diagnostics) and sEng by ELISA (R&D Systems, UK). Results: PE women who smoked during pregnancy had elevated first trimester concentrations of serum PIGF (39.8 ± 1.6 pg/ml, $p=0.001$, geometric mean \pm SD) and decreased sEng concentration (5.0 ± 1.3 ng/ml, $p=0.047$) compared to PE non-smokers (30.0 ± 1.5 pg/ml and 6.1 ng/ml, respectively). Similar differences were observed among controls. Within PIGF some dose-response was suggested among PE women. Conclusions: The effect of smoking in reducing the risk of PE may be due to the increase in PIGF and decrease in sEng concentrations. Thus, in future, special attention should be paid on the smoking mothers when angiogenic markers are utilised in PE risk prediction.

MUTATION OF TRANSIENT RECEPTOR POTENTIAL VANILLOID 6 IN HEALTHY AND PREECLAMPTIC HUMAN PLACENTA

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Preeclampsia is a pregnancy-specific disease characterized by hypertension, proteinuria, and oxidative stress in the placenta. During the last trimester of gestation, calcium Ca^{2+} transport from mother to fetus increases dramatically in response to increased demand for Ca^{2+} caused by bone mineralization in the fetus. Several recent studies have reported that Ca^{2+} supplementation can significantly reduce the incidence and severity of preeclampsia or delay its onset. However, other groups have found that Ca^{2+} supplementation did not alleviate the severity of preeclampsia. To identify the cause of these varying consequences of Ca^{2+} supplementation, we analyzed the position, sequence and frequencies of TRPV6 variants in preeclampsia patient. we analyzed the position, sequence and frequencies of TRPV6 variants in preeclampsia patient and examined gene expression of primary culutre trophoblast from preeclampsia patients with the mutated TRPV6. 20% of these patients were found to have a TRPV6 point mutated gene sequence that resulted in a methionine to valine conversion. Moreover, primary cultured trophoblast from preeclampsia patients with the mutated TRPV6 showed decreased carbamylcholine induced Ca^{2+} influx compared to the control group. It is possible that the mutated TRPV6 could induce various calcium supplementation effects due to insufficient transport of Ca^{2+} into components of the placenta such as decidua. In summary, TRPV6 mutation could be a marker for obstinate preeclampsia; therefore, identifying pregnant women with TRPV6 mutation could enable them to take efforts to prevent preelcampisia

TROPHOBLAST CELL SURFACE ANTIGEN 2 IN PREECLAMPSIA: IN VIVO AND IN VITRO ANALYSIS

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Human trophoblast cell surface antigen 2 (Trop2) is a 40-kDa transmembrane glycoprotein, encoded by TACSTD2 gene and identified for the first time in human trophoblast and choriocarcinoma cell lines. Trop2 has a short intracytoplasmic tail essential for the control of several pathways that regulate cellular functions such as cell- cell adhesion, cell proliferation and mobility. We have analysed the expression of Trop2 in human normal placentas and in placentas complicated by preeclampsia (PE). Trop2 protein expression was assessed by immunohistochemistry and quantitative western blotting analyses. These studies were made in normal and pathologic placental tissues. Trop2 was increased during gestation, i.e. from first to third trimester of gestation. Lower expression of Trop2 protein was detected in placental tissues collected from patients with preeclampsia. Since PE is a pathology associated with placental hypoxia, BeWo cells were placed at 37°C in either standard culture condition

(20% O₂) or kept in an atmosphere of 3% O₂ in order to demonstrate that the expression of Trop2 could be downregulated in hypoxic conditions. The results showed that Trop2 was downregulated in treated cells compared to untreated control cells maintained at standard conditions. Our study suggests a possible involvement of Trop2 in the differentiation of the syncytiotrophoblast from villous cytotrophoblast and a possible role of this protein in PE.

ASSOCIATION BETWEEN NEURAL INJURY MARKERS AND NEURODEVELOPMENT AT 2 YEARS IN INTRAUTERINE GROWTH RESTRICTION

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Objective To evaluate the relationship between brain injury biomarkers and neurodevelopment at 2 years in intrauterine growth restricted infants (IUGR). **Methods** A study including 31 IUGR fetuses and 25 gestational-age (GA) matched controls. S100 protein (S100b) and Specific Neuronal Enolase (SNE) were measured in cord blood and maternal serum at the moment of delivery. Neurodevelopment was evaluated at 2 years using the Bayley Scales of Infant and Toddler Development, 3rd Edition (Bayley-III). **Results** GA at delivery was 36,69 in IUGR and 37,48 in controls (p=0.255). There were no differences between IUGR and controls in the incidence of perinatal or neonatal complications. Neurodevelopmental evaluation at 2 years showed no differences between IUGR and controls in any of the tests. We found significant inverse relationship between concentration of SNE in cord blood and fine motor subtest and social-emotional test (p0.05) in controls and in controls and IUGR in both. And also between concentration of S100b in cord blood and language test (p0.05) in controls and between S100b in cord blood and cognitive test, receptive communication subtest and social-emotional test (p0.05) in controls and IUGR in both. In IUGR we only found significant inverse relationship between concentration of S100b in maternal serum and adaptive behavior test (p0.05). **Discussion** SNE and S100b were higher in controls and in IUGR with worst scores in some areas of neurodevelopmental evaluation at 2 years. However, the value of these biomarkers for prognostic neurodevelopmental purposes both in controls and in IUGR deserves further investigation.

TARGETED LIPIDOMICS OF MATERNAL AND CORD BLOOD IN TERM GESTATIONS WITH FETAL GROWTH RESTRICTION

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Objective: To characterize lipid metabolomic changes in maternal and umbilical cord blood samples in full-term gestations with sub-optimal fetal growth. **Methods:** Nested case-control study in singleton term gestations including 27 normally grown newborns and 51 small fetuses sub-classified into SGA (birthweight 3-9th centile and normal fetoplacental Doppler, n=27) and FGR (birthweight 3rd centile and/or CPR 5th centile, and/or uterine artery mean PI95th centile, n=24). Maternal and cord blood plasma samples were analyzed by ¹H-NMR and diffusion data assessed by targeted metabolomics, to determine lipoprotein content, choline and glycoprotein compounds (Liposcale[®] test). **Results:** Targeted lipidomics could clearly discriminate between the study groups and subgroups. Lipoprotein

profiles showed significantly lower maternal plasma concentrations of cholesterol-IDL (-17%), and triglycerides-IDL as well as -HDL (-13%) (-18%) in cases with suboptimal fetal growth (both, SGA and FGR) compared to controls (all p<0,05). While FGR fetuses had significant higher concentrations of cholesterol-VLDL (+56%), -IDL (+24%), triglycerides-VLDL (+24%) and -IDL (+18%) compared to controls (all p<0,005). FGR cases also showed a significant increases in all VLDL particle types (L, M and S: average +37%) vs. controls. Importantly, a decrease in HDL (M) was noticed in FGR (-11%) vs. SGA fetuses. Changes in choline compounds and glycoproteins were more prominent in FGR fetuses vs. controls, indicating significant alterations in their abundance and biophysical properties. Conclusion: These results build upon our previous non-targeted lipidomic analysis, provide a substantial understanding of the widespread disruption of lipid profiles in both maternal and cord blood of pregnancies with suboptimal fetal growth.

PREGNANCY-ASSOCIATED EXOSOMES CHANGES IN PREGNANCIES COMPLICATED BY INTRAUTERINE GROWTH RESTRICTION WITH AND WITHOUT PREECLAMPSIA

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Objective: Very little is known about exosomes in pregnancy and in particular in pregnancy complications. The aim of this study was to quantify the concentration of circulating and placenta-derived exosomes in pregnancies complicated by intrauterine growth restriction (IUGR) with and without preeclampsia (PE). Methods: This case-control study included patients in the following groups: (1) Appropriate for gestational age (AGA) (n=10); (2) IUGR without PE (n=22); and (3) IUGR with PE (n=8). Exosomes were isolated from plasma (maternal and cord blood) through differential and buoyant density centrifugation and characterized by morphology, enrichment of exosomal proteins, and size distribution by electron microscopy, western blot, and nanoparticle tracking analysis (NTA), respectively. Results: In maternal plasma, the median (IQR) concentration of CD63⁺ exosomes (10¹¹ vesicles x mL) was significantly higher in patients with IUGR and PE than in those without PE and controls [4.4 (3.2 – 8.5) vs. 2.9 (2.3 – 3.9) and 1.5 (1.3 – 3); p=0.05 and 0.03, respectively]. The maternal PLAP ratios (PLAP/CD63⁺) were significantly lower in cases than in controls, with a trend of reduction accordingly with the severity of the disease, being more reduced in cases of IUGR with PE, than in IUGR without PE and controls (both p<0.001). Accordingly, the cord blood fraction of PLAP exosomes was significantly lower in patients with IUGR and PE than in those with IUGR without PE and controls (p<0.0001 and 0.0001, respectively). Conclusions: We suggest the quantification of placental exosomes in maternal plasma may be a useful tool for monitoring fetal development and pregnancy outcomes.

PRENATAL STRESS MODIFIES RNA EXPRESSION AND DNA METHYLATION OF PLACENTAL 11 β -HSD2 IN FETAL GROWTH RESTRICTION

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Objective: Placental 11 β -hydroxysteroid dehydrogenase type 2 (11 β -HSD2) operates as a functional barrier to protect the fetus from excessive exposure to maternal cortisol. The objective was to determine the role of maternal stress in sub-optimal fetal growth and its relation with RNA expression and DNA methylation of the placental 11 β -HSD2. **Methods:** Nested case-control study in full-term singleton gestations. Perceived Stress Scale (PSS) was assessed in mothers of pregnancies with antenatal suspicion of sub-optimal fetal growth that subsequently delivered a small for gestational age (SGA) neonate [birthweight (BW)10th centile; n=35] and in a control group who delivered normally grown neonates (n=26). In addition, RNA expression and DNA methylation of placental 11 β -HSD2 in four CpGs sites were also analyzed. **Results:** Maternal stress (PSS26) was significantly higher in cases than in controls [34.3% (12/35) vs. 7.7% (2/26); p=0.006]. PSS had a significant negative correlation with neonatal BW percentile (r=-0.26; p=0.04). Furthermore, placental 11 β -HSD2 RNA expression (α)^(Ln) was significantly lower in cases than in controls [0.41 (0.29 – 0.87) vs. 1.1 (0.62 – 1.75); p=0.003]. No differences were found in the percentage of placental 11 β -HSD2 methylation between cases and controls. However, when groups were subdivided according to the presence of maternal stress, SGA cases with maternal stress (n=12) have a significantly different (%) of methylation in the median CpGs compared to controls [8.3 (7.6 - 10.3) vs. 11.4 (10.2 - 13.1); p=0.02]. **Conclusion:** Our findings indicate a significant association between pregnant women's stress on suboptimal fetal growth, affecting RNA expression and DNA methylation of glucocorticoids-related placenta genes.

PREMATURE PLACENTAL AGEING IN TERM SMALL FOR GESTATIONAL AGE FETUSES

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Objective: We aimed to assess placental ageing through senescence and apoptotic markers in term small-for-gestational age (SGA) and fetal growth restricted (FGR) cases. **Methods:** Nested case-control study in singleton pregnancies delivering at term including 21 normally grown newborns and 36 small fetuses subclassified into SGA (if birthweight 3-9th centile normal fetoplacental Doppler, n=18) and FGR (if birthweight 95th centile, n=18). Placental samples were collected at delivery and snap-frozen for subsequent analysis of telomerase activity using TRAP assay, telomere length and RNA expression of senescence (Sirtuin 1,3,6) and apoptotic markers (p53, p21, BAX, Caspase 3 and 9) by Quantitative Real-Time PCR (qPCR). **Results:** Compared with normally grown fetuses, both SGA and FGR cases presented signs of premature placental ageing including lower telomerase activity (controls mean 12.8 % (6.6) vs SGA 7.98 % (4.2) vs FGR 7.79 % (4.6), p=0.008), shorter telomeres (controls 1.20 T/S (0.6) vs SGA 1.08 T/S (0.9) vs FGR 0.66 T/S (0.5), p=0.017) and reduced Sirtuin1 expression (controls 1.55 2- Δ Δ Ct (0.8) vs SGA 0.91 2- Δ Δ Ct (0.8) vs FGR 0.63 2- Δ Δ Ct (0.5), p0.001) and increased p53 expression (controls 1.07 (3.2) vs SGA 5.39 (15) vs FGR 3.75 (7.8), p=0.040), with a significant linear tendency to across severity stages. In addition, FGR cases presented increased levels of Caspase 3 (controls 0.94 (1.1) vs FGR 3.98 (30), p=0.031) and 9 (controls 1.21 (4.0) vs FGR 3.87 (8.7), p=0.037) as compared to controls. **Conclusions:** Signs of premature placental ageing could be observed in both SGA and FGR, suggesting some degree of true fetal growth restriction in both groups.

DIFFERENT PATTERNS OF PLACENTAL NUTRIENT TRANSPORT AMONG TERM SMALL FOR GESTATIONAL AGE AND GROWTH RESTRICTED FETUSES

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Objective: Fetal growth is directly related to maternal nutrient availability and the placenta's ability to transport these nutrients from maternal circulation to the fetus. We aimed to evaluate placental nutrient transport in small-for-gestational age (SGA) and fetal growth restricted (FGR) newborns. **Methods:** A nested case-control study including singleton pregnancies delivering at term classified as normally grown newborns (n=18) and small fetuses subclassified into SGA (if birthweight 3-9th centile normal fetoplacental Doppler, n=18) and FGR (if birthweight 3th centile and/or cerebroplacental ratio 5th centile and/or uterine artery mean pulsatility index 95th centile, n=18). RNA expression levels of GLUT1 (glucose transporter), SNAT1 (System A amino acids transporter), ABCA1 (cholesterol transporter) and FABP1 (fatty acids transporter) were analyzed in placental samples collected at delivery. **Results:** While SNAT-1 expression was similar among groups, placental expression of GLUT1 was significantly reduced in both SGA and FGR cases (controls $1.55 \cdot 2^{-\Delta \Delta Ct}$ (1.7) vs SGA $0.07 \cdot 2^{-\Delta \Delta Ct}$ (0.4) vs FGR $0.15 \cdot 2^{-\Delta \Delta Ct}$ (0.8), p=0.001) as compared to normally grown fetuses. In addition, placental ABCA1 (controls $1.25 \cdot 2^{-\Delta \Delta Ct}$ (12.6) vs SGA $2.15 \cdot 2^{-\Delta \Delta Ct}$ (15) vs FGR $0.66 \cdot 2^{-\Delta \Delta Ct}$ (1.7), p=0.025) and FABP1 (controls $1.29 \cdot 2^{-\Delta \Delta Ct}$ (1.8) vs SGA $1.31 \cdot 2^{-\Delta \Delta Ct}$ (4.0) vs FGR $0.44 \cdot 2^{-\Delta \Delta Ct}$ (1.1), p=0.041) expression was significantly reduced in FGR as compared to SGA and controls. **Conclusion:** Our data suggest different patterns of placental nutrient transport in small fetuses. Despite no clinical signs of placental insufficiency, SGA associates reduced placental glucose transport challenging the concept of constitutionally small.

PATTERN OF PLACENTAL STROMAL-VASCULAR LESIONS IN SMALL FETUSES WITH AND WITHOUT PREECLAMPSIA

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Objective: The aim of this study was to describe pattern placental pathological findings in a large cohort of small-for-gestational age (SGA) newborns with and without preeclampsia (PE), as compared to uncomplicated pregnancies. **Methods:** A prospective cohort study of 145 uncomplicated pregnancies and 237 SGA newborns (defined by birth weight 10th centile) including 95 cases associated to PE. Placental lesions were histologically categorized according to the 2015 Redline classification. **Results:** SGA cases associated to PE showed a higher prevalence of maternal lesions in the placenta including maldevelopment (controls 2.2% vs SGA 2.5% vs SGA+PE 16.2%, p 0.001) and malperfusion (controls 28.4% vs SGA 33.1% vs SGA+PE 73.8%, p 0.001), with a similar prevalence of fetal stromal-vascular lesions as compared to normotensive SGA and uncomplicated pregnancies. In contrast, normotensive SGA was significantly associated with fetal maldevelopment lesions (controls 3% vs SGA 8.3% vs SGA+PE 0%, p=0.009) with similar prevalence of maternal vascular-stromal lesions as compared to uncomplicated pregnancies. **Conclusions:** SGA+PE is predominantly associated to maternal stroma/vasculature lesions in the placenta while normotensive SGA associates fetal maldevelopment

lesions. Comprehensive classification of placental lesions might help to better understand the pathophysiology underlying fetal growth restriction and PE.

IMMEDIATE PERINATAL RESULTS IN DELIVERY INDUCTIONS BY INTRAUTERINE GROWTH RESTRICTION TYPE I

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INTRODUCTION Intrauterine growth restriction (IUGR) is a frequent complication of gestation (5-10% of pregnancies), representing a major public health problem associated with increased neonatal morbidity and disorders in neurodevelopment. Early identification and early obstetric and pediatric management can improve these outcomes.

OBJECTIVE To analyze the perinatal results of IUGR type I fetuses whose delivery has been the result of medical induction with vaginal prostaglandins. **MATERIAL AND METHOD** Retrospective observational study of 101 IUGR type I inductions from January 2015 to June 2016, analyzing Apgar at birth, days of hospitalization, admission to NICU and immediate neonatal complications. **RESULTS** In 96% of cases, Apgar in the first minute of birth was ≥ 7 . Only one newborn required stay at NICU. The mean hospital stay was 4.15 days, and there were a total of 28 neonates (27.72%) with hospital stay ≥ 3 days. We found 1 marijuana abstinence syndrome, 1 Down syndrome, 1 cleft palate and 1 agenesis of the corpus callosum as postnatal findings justifying the longer stay. Immediate neonatal complications include 21 neonatal transient jaundice (20.79%), 13 neonatal hypoglycemia (12.87%), 6 fetal malnutrition (5.94%), 1 cephalohematoma (0.99%) and 1 mild perinatal asphyxia (0.99%). **CONCLUSIONS** Considering that the time of hospitalization of a healthy newborn to term ranges from 2 to 3 days, in these infants the average stay is increased to 4 days, with a third of the total with a hospital admission rate of more than 3 days

SMALL FOR GESTATIONAL AGE BABIES OF TERM LOW RISK PREGNANCIES: DOES ANTENATAL DETECTION MATTER?

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INTRODUCTION: Small- compared to appropriate-for-gestational-age babies have a higher risk of adverse outcomes. Our main aim was to compare delivery route and admission to neonatal intensive care unit between small- and appropriate-for-gestational-age babies among term low risk pregnancies. **MATERIALS AND METHODS:** A retrospective study was conducted at a tertiary hospital. Low risk pregnancies with a term delivery in 2014 were selected. Babies delivered at 37 weeks with birthweight ≤ 2500 g were considered small for gestational age. Fetal weight estimation at 30th-33rd weeks ultrasound 10th percentile was considered antenatal detection of small for gestational age. We included 80 women with small for gestational age babies and 1281 women with babies with adequate weight for gestational age. Statistical analysis was performed with Chi-square test, Fisher's exact test, Student's t test and multiple logistic regression. **RESULTS:** Small for gestational age babies were associated with higher rates of cesarean deliveries (25/80 vs 231/1281, $p = 0.01$), cesarean sections for nonreassuring fetal status (15/80 vs 12/1281, $p = 0.001$) and admissions to neonatal intensive care unit (16/80 vs 19/1281, $p = 0.001$). **CONCLUSIONS:** In our series, term small for gestational age babies

were associated with more adverse outcomes (cesareans for nonreassuring fetal status and admissions to neonatal intensive care unit) than adequate weight for gestational age babies.

INSULIN REVERSES ENDOTHELIAL DYSFUNCTION VIA A_{2B} ADENOSINE RECEPTOR ACTIVATION IN HUMAN UMBILICAL VEIN ENDOTHELIUM FROM LATE-ONSET PREECLAMPSIA

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Insulin dilates umbilical vein requiring A_{2A} adenosine receptor (A_{2A}AR) activation in normal pregnancies; however, whether A_{2A}AR are involved in late-onset preeclampsia (LOPE)-reduced insulin dilation is unknown. LOPE increases maternal and foetal plasma adenosine and A_{2B}AR expression in human umbilical vein endothelial cells (HUVECs). A_{2B}AR involvement and insulin effect on the foetoplacental vascular function in LOPE is unknown. Aim: To evaluate A_{2A}AR and A_{2B}AR involvement on insulin effect on endothelial function in LOPE. Methods: Protein abundance of p44/42^{mapk}, protein kinase B/Akt (Akt), endothelial nitric oxide synthase (eNOS) were detected by Western blot. Assays were in the absence or presence (8 h) of 1 nM insulin, A_{2A}AR and A_{2B}AR agonist and antagonist. Vascular response to insulin (0.1-1000 nM, 5 min) was measured in precontracted umbilical vein rings in the absence or presence of A_{2A}AR and A_{2B}AR antagonists. L-Citrulline level was measured by HPLC in the absence or presence of N^G-nitro-L-arginine methyl ester in HUVECs. Results. Insulin increased Akt, p44/42^{mapk}, Ser¹¹⁷⁷ eNOS phosphorylation, and total eNOS protein abundance in HUVECs from normal pregnancies. A_{2A}AR and A_{2B}AR activation enhanced insulin effect only on Akt. LOPE only increased Ser¹¹⁷⁷ eNOS phosphorylation and total eNOS protein abundance. Insulin blocked LOPE-increased Ser¹¹⁷⁷ eNOS phosphorylation. A_{2A}AR and A_{2B}AR activation did not change insulin effect on Akt and p44/42^{mapk}, whereas A_{2A}AR antagonist reversed insulin-decreased Ser¹¹⁷⁷ eNOS phosphorylation and increased total eNOS protein abundance in LOPE. Insulin dilation of umbilical veins from normal pregnancies was lower in the presence of A_{2A}AR. LOPE reduced insulin dilation, which was restored by A_{2A}AR antagonists. Insulin increased L-citrulline content, a phenomenon blocked by A_{2A}AR and A_{2B}AR antagonists in normal pregnancies. LOPE increased L-citrulline content, which was unaltered by insulin in absence of A_{2A}AR and A_{2B}AR antagonists. However, insulin increased L-citrulline content in the presence of A_{2A}AR antagonists, but blocked by A_{2B}AR antagonists in LOPE. Conclusion. The reduced foetoplacental vascular response to insulin in LOPE involves A_{2A}AR activation, a phenomenon counteracted by A_{2B}AR activation.

Pre-Gestational Diabetes

EXPLORING THE FEASIBILITY OF AN INNOVATIVE PRE-CONCEPTION INTERVENTION IN MALAYSIA – PRELIMINARY FINDINGS FROM A PROCESS EVALUATION

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The three-fold negative consequences of gestational diabetes (negative pregnancy outcomes and increased risk of diabetes and other non-communicable diseases later in life for both mother and child) are well documented. Whereas many countries have not yet introduced systematic screening during pregnancy, a group of institutions spear-headed by the Ministry of Health in Malaysia (MoH) is currently exploring the efficacy and feasibility of a pre-conception intervention among young couples. An RCT examines an intervention, which combines an app tailored to the life-worlds of the young couples and interactions with community health nurses who have been given training on Motivational Interviewing (MI) and basic knowledge of relevance to diabetes, diet and physical exercise. Alongside with the RCT, four process evaluation studies are being conducted based on the principles of realistic evaluation and mixed methods. The paper reports on preliminary findings from three of these, addressing questions such as: “Is it feasible to recruit young Malaysian couples for a pre-conception intervention at the time of marriage?”; “is it feasible to apply MI within the Malaysian health care system?” and “what are the experiences of using an app in a lifestyle intervention?”. The combined results from the trial and the process evaluation will guide the MoH in planning a national pre-conception intervention with the view to curb the trend of increasing gestational diabetes in Malaysia.

PLACENTAL MIRNA PATTERNS IN PREGESTATIONAL DIABETES

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Background and aims: Offspring of mothers with type 1 diabetes (T1D) are at increased risk of T1D, but have a lower risk than offspring of fathers with T1D. This could be explained by intrauterine, epigenetic effects, detectable at birth. Our aim was to assess the effect of maternal T1D on placental expression of miRNAs. Material and methods: Samples of the maternal and foetal sides of the placenta were obtained from women with T1D (N=38, 3rd trimester HbA1c 6.4 (0.9)%) and T2D (N=32, HbA1c 6.1 (0.7)%), women whose partner had T1D (N=15) and controls matched for age and gestational age (N=59). In ten "pools" of 8-10 samples, massive sequencing of mRNA and miRNAs was performed. MiRNAs that showed a difference in expression between groups (p < 0.1) and an inverse difference in the target mRNA (fold-change > 1) led to the identification of 5 new and 8 known miRNAs. The following were selected for validation via qPCR (EXIQON miRCURY Universal RT Kit; cel-miR-39-3p as internal control) in the individual samples in each pool: MiR-372-3p, MiR-127-3p, MiR-145-5p, MiR-373-3p, MiR-125b-5p, MiR-16-5p, MiR-19a-3p, MiR-20a-5p and Chr11-134. Quantile normalisation was performed and Δ CT values (with miR-16-5p as reference due to its most stable expression across groups) were compared (pair-wise, cluster- and principal component analysis (PCA)). Results: As an example for comparison between T1D and controls, the figure shows a heatmap, cluster analysis and PCA. Conclusions: MiR expression patterns distinguish T1D placentas from controls. Further analysis of existing data and replication in the whole sample is pending.

MATERNAL AND NEONATAL OUTCOMES OF PREGNANCIES COMPLICATED BY OBESITY

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OBJECTIVE: Obesity is a recognized risk factor for pregnancy complications and adverse perinatal outcomes. The aim of this study was to investigate maternal and neonatal outcomes of pregnancies complicated by obesity. **METHODS:** We retrospective reviewed data charts of 1218 consecutive women, with singleton pregnancies, who delivered in our hospital between Aug-2016 and Dec-2016, with a known pre-pregnancy BMI. Patients were divided in two groups according to BMI. Maternal and neonatal characteristics were compared between the two groups. Data were analyzed using Fisher-exact and T-test, p **RESULTS:** Obese patients were more frequent nulliparous (2982vs622/1136;p0.00) or with a previous Cesarean Section (CS)(19/82vs75/1136;p0.001). Pre-gestational and gestational diabetes were more frequent diagnosed in obese women (11%vs5%;p0.01). No difference was found in the rate of preterm delivery 34wks(1.2%vs2%;p=0.5) or hypertensive disorders(1.2%vs1.9%;p=0.5) Obese women showed a greater incidence of labor induction(46/70vs27/1007;p0.001) and epidural analgesia use(28/70vs428/1007;p0.007), but similar rates of vaginal delivery(74%vs79%;p=0.1), elective CS(15%vs11%;p=0.2) or CS during labor(11%vs9%). Obesity increased the risk of severe post-partum hemorrhage (1000cc)(8/82vs24/1136;p=0.01). Neonatal outcomes were similar between the two groups (Table1). **CONCLUSIONS:** Our results confirm that obesity in pregnancy is frequently associated with metabolic disorders and can lead to an increase risk of labor induction, need of epidural analgesia and post-partum hemorrhage. A good standard of care is required to ensure the achievement of vaginal delivery and good neonatal outcomes.

FIRST TRIMESTER PROINFLAMMATORY CYTOKINES AND 3D PLACENTAL POWER-DOPPLER INDICES IN WOMEN WITH PREGESTATIONAL DIABETES

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Objective. To evaluate first trimester proinflammatory cytokines and its relationships with placental power-Doppler indices in women with pregestational diabetes. **Material and Methods.** Prospective case-control study about women with normal (n= 27) and pregestational diabetes pregnancies (n=10). Three dimensional placental volume and vascularization indices (FI, VI and VFI) were measured at the time of the first trimester (gestational age 12.2 ± 0.5 and 12.2 ± 1.0 weeks, respectively). At the same time, maternal plasma concentrations of IL-6, TNF- α , VEGF, PIGF and leptin levels were measured. Additionally, endothelial dysfunction markers (VCAM, ICAM, PAI-1) were also measured. Comparisons between two groups were performed by using the Student t test. The relationships between variables were analyzed using Pearson's correlation coefficient. **Results.** When control and pregestational diabetes group cytokines levels were compared, there were significant higher proinflammatory levels in women with diabetes: IL-6 [1.66 (1.66-6.59) Vs 9.09 (5.28-20.93) pg/mL, p=0.001], TNF- α [1.46 (1.46-1.46) Vs 3.06 (2.79-4.05) pg/mL, p=0.001], PIGF [2.73 (0.86-5.29) Vs 12.09 (10.95-22.97) pg/mL, p=0.001] and VCAM levels [143.82 (114.03-184.65) Vs 736.62 (624.25-1025.75) pg/mL, p=0.001]. No differences were found for placental vascularization indices (VI, FI and VFI), however placental volumes were higher in the diabetic group: [48.33 (43.21-55.7) Vs 66.55 (50.6-84.65), p=0.04]. In the diabetic group negative correlations were found between FI and endothelial dysfunction markers ICAM (r=-0.73, p=0.02) and VCAM (r=-0.88, p=0.004). **Conclusions.**

Women with pregestational diabetes showed higher proinflammatory and endothelial dysfunction markers levels. This proinflammatory status may influence placental vascularization.

ANALYSIS OF THE INFLUENCE OF GLYCEMIC CONTROL BY TRIMESTERS ON FETAL GROWTH IN PREGNANT WOMEN WITH TYPE 1 DIABETES MELLITUS.

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Pregnant women with type 1 diabetes mellitus have a higher frequency of obstetric complications. Glycemic dysregulation, usually found in these patients, is a central point in the pathophysiology of fetal growth disorders. The objective of this study was to analyze the impact of glycemic control in birth weight. Methods: Sixty pregnant women with type 1 diabetes who started prenatal care in the first trimester at the *Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo* between 2013 and 201 were evaluated prospectively. Capillary glycemia was performed seven times a day throughout the pre-natal period, the data were analyzed by trimester of pregnancy and were categorized according to the following criteria: glycemic mean, severe hypoglycemia (40mg/dl), hypoglycemia (70mg/dl), Hyperglycaemia (95mg/dl in fasting, 100mg/dl in the preprandial, 140mg/dl in the prandial powders), severe hyperglycemia (200mg/dl). The cases were divided into three groups according to birth weight: small for gestational age (SGA), adequate for gestational age (AGA) or large for gestational age (LGA). The statistical analysis was performed using the Friedman's two-way analysis of variance by ranks. Results: Frequency of LGA was 31.7% and SGA was 10%. There were significant differences in birth weight according to glycemic mean (p 0.001), percentage of hypoglycemia (p 0.001) and percentage of hyperglycemia (p 0.001). Conclusion: Glycemic dysregulation influences fetal growth in type 1 diabetic pregnant women.

INFLUENCE OF SERUM CREATININE ON FETAL GROWTH IN PREGNANT WOMEN WITH TYPE 1 DIABETES MELLITUS.

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Fetal growth in diabetic pregnant women is strongly affected by glycemic control however other factors can influence it. Renal involvement as a diabetic complication is indicative of vasculopathies. Non-dialytic renal failure is frequent in patients with type 1 diabetes mellitus with poor clinical follow-up and may influence placentation and consequently perinatal outcome. The objective of the authors was to evaluate the impact of serum creatinine on fetal growth in pregnant women with type 1 diabetes mellitus. Methods: Sixty pregnant women with type 1 diabetes who started prenatal care in the first trimester at the Obstetrics Clinic of the *Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo* between 2013 and 2016 were prospectively evaluated. Birth weight was classified according to the custom curve of fetal growth in small to gestational age (SGA), adequate for gestational age (AGA) or large for gestational age (LGA). The values for serum creatinine analysis are described in mg/dL and are collected by trimesters. For statistical analysis Kruskal-wallis Test was used. Results: Serum creatinine values correlated with fetal growth independently of the assessed trimester (first trimester p = 0.003, second trimester p = 0.009, third trimester p 0.001). Higher values of creatinine correlated with an increase in the frequency of SGA. Thus, it was possible to make a prediction curve of SGA based on the creatinine values of the first trimester of pregnancy.

THE IMPACT OF SYSTEMIC ARTERIAL HYPERTENSION ON FETAL GROWTH IN PATIENTS WITH TYPE 1 DIABETES MELLITUS.

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One of the major complications in patients with type 1 diabetes mellitus is vasculopathy. The treatment of diabetes outside the gestational period aims to control lesions in the target organ due to vasculopathy. Fetal growth in diabetic pregnant women is strongly affected by glycemic control however other factors can influence the perinatal outcome. Systemic arterial hypertension may also influence gestational outcome. The objective of the authors was to evaluate the impact of the presence of arterial hypertension on fetal growth in pregnant women with type 1 diabetes mellitus. Methods: Sixty pregnant women with type 1 diabetes mellitus, who started prenatal care in the first trimester, were prospectively evaluated at the Obstetric Clinic of the *Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo* between 2013 and 2016. Patients were classified if they have arterial hypertension by the current criteria of the International Society for the Study of Hypertension in Pregnancy. Birth weight was classified according to the personalized curve of fetal growth in small to gestational age, adequate for gestational age or large for gestational age. Fisher's test was used for statistical analysis. Results: The frequency of systemic arterial hypertension was 25% (n = 15 cases). The presence of large newborns for gestational age was significantly lower in the group with arterial hypertension (5.3% vs. 94.7%, p = 0.008). The presence of small newborns for gestational age was significantly higher in the group with arterial hypertension (66.7 vs. 33.3%, p = 0.008).

DOES EARLY GESTATIONAL DIABETES MELLITUS CORRESPOND TO UNKNOWN PREDIABETES BEFORE PREGNANCY? ARGUMENTS FROM METABOLIC MARKERS AT INITIAL CARE.

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INTRODUCTION : Screening for dysglycemia at first antenatal visit was proposed to detect unknown diabetes outside pregnancy (Diabetes in pregnancy: DIP). Early gestational diabetes mellitus (eGDM), beginning before pregnancy-induced insulin resistance, might correspond to unknown prediabetes. **METHODS :** We selected from 188 pregnant women without known diabetes before pregnancy and having had skin forearm skin autofluorescence measure (AGE Reader(tm)): 8 without eGDM and regular GDM (IADPSCG criteria); 62 with eGDM (22 weeks of gestation); 48 with regular GDM but normal early screening; and 8 with DIP. Women with dysglycemia also had fasting plasma glucose, insulin, fructosamine and HbA1c measurements before care. **RESULTS :** Skin autofluorescence (AGE, arbitrary units) differed according to glycemic status (p0.05 after adjustment for age): no GDM (1.79±0.32), regular GDM (1.99±0.47), eGDM (2.11±0.48) and DIP (2,42±0,34) ; with different proportion of women having AGE 1 standard deviation (SD) (41.7 ; 45.8 ; 54.8 et 100% respectively ; p0.05) or 2 DS for age (8.3 ; 10.4 ; 25.8 et 50% respectively ; p0.05). Considering only women with regular GDM, eGDM and DIP, fructosamine (196±12 ; 203±18 and 223±35 µmol/L respectively, p0.0001), and HbA1c levels (4.9±0.5 ; 5.0±0.4 et 5.8±0.8% ; p0.001) differed but not HOMA-IR index (2.73±1.59 ; 2.78±1.76 and 4.39±2.41; p=0.057). **DISCUSSION** HbA1c and fructosamine are high in case of DIP but not eGDM. Skin autofluorescence is higher in eGDM and DIP than in women without GDM and regular GDM, suggesting that these conditions actually correspond to dsglycemia before pregnancy.

PRECONCEPTION DIABETES DIETETIC STANDARDS – AN AUDIT OF WOMEN WITH PRE-GESTATIONAL DIABETES.

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Introduction: The complex situation of diabetes in pregnancy increases both maternal and foetal risk. Preconception care can reduce these risks and is of particular importance as congenital abnormalities have been linked to poor glycaemic control in the critical window of organogenesis during the first trimester of pregnancy (1). **Methods:** Data was collected by interview during the booking assessment visit with the dietitian, for women with both Type 1 (T1DM) and Type 2 Diabetes (T2DM). Data included anthropometry, attendance at a structured education programme (SEP), prior dietetic review and folic acid supplementation. **Results:** Of the women with T1DM, 8/38 had previously seen a dietitian, 23/39 had attended SEP, 29/38 had taken the correct dose of folic acid (5mg) for the correct duration (3 months) pre-pregnancy and 21/40 had a BMI $\geq 25\text{kg/m}^2$. Of the women with T2DM, 4/13 had previously seen a dietitian, only 2/13 had attended SEP, 9/13 had taken folic acid appropriately and 11/14 had a BMI $\geq 25\text{kg/m}^2$. **Discussion:** National guidelines for the management of pre-gestational diabetes recommend a healthy diet, optimal glycaemic control, weight loss for those who are overweight and dietetic review as part of preconception care. Structured patient education should be available to all people with diabetes (2, 3). These results demonstrate the need for increased dietetic services to achieve these standards and may be useful for dietetic service planning. Availability of SEP and individualised dietetic assessment must be prioritised for women of child-bearing age with diabetes. **References:** 1. Owens et al, (2016) “Ten years of optimizing outcomes for women with type 1 and type 2 diabetes in pregnancy – the Atlantic DIP experience” *J Clin Endocrinol Metab* 2. Guidelines for the management of pre-gestational and gestational diabetes mellitus from pre-conception to the postnatal period. HSE, 2010. 3. Review of diabetes structured education HSE, 2009.

AWARENESS OF PREGNANCY RELATED ISSUES AND KNOWLEDGE OF DISEASE IN WOMEN OF CHILDBEARING AGE WITH TYPE 1 DIABETES: WHAT HAS CHANGED IN 2 DECADES

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Aim of this study was to document awareness about diabetes and importance of pregnancy planning in women of childbearing age attending diabetes clinics of the IRCCS San Raffaele in Milan (Italy). Between 29/02/2016 and 31/05/2016, we distributed a self-administered anonymous questionnaire to survey knowledge of women with type 1 diabetes about their disease and the reproductive sphere. To document changes overtime results of this survey were compared to those obtained in 1997 using a similar questionnaire. The questionnaire was completed by 120 women (vs 85 in 1997). The mean age at diabetes onset was 13.3 ± 8.7 years vs 18.3 ± 10.2 years in 1997. Self-reported HbA1c levels improved to $7.4 \pm 3.1\%$ (57 ± 10 mmol/mol) from $8.0 \pm 1.7\%$ (64 ± 4 mmol/mol) in 1997. The proportion of patients attending diabetes education sessions increased to 55% from 23.5% in 1997. Of the current sample 72.6% of the women reported having received information about the importance of pregnancy planning vs. 62.2% in 1997; of the 46 pregnancies reported by our participants, 64% were not planned vs a rate of unplanned pregnancy of 66.7% (estimated on 41 pregnancies) in 1997. Eighty-five percent

of women used some contraception during their lives, and 77% were using them at the time of the survey (the respective proportion were 72% and 65% in 1997). Despite an overall improvement in glucose control, diabetes education, and use of contraception, the reported proportion of unplanned pregnancy remains high, with no appreciable changes from 1997, still missing a unique opportunity to improve pregnancy outcomes in women with diabetes.

CHANGE IN INSULIN REQUIREMENTS DURING PREGNANCY IN JAPANESE WOMEN WITH TYPE 1 DIABETES

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We investigated the change in insulin requirements and factors affecting the insulin dose in pregnant Japanese women with type 1 diabetes. **Methods** A retrospective observational study was conducted on 77 singleton pregnant women with type 1 diabetes (age, 32.1 ± 0.7 years; duration of diabetes, 14.6 ± 8.2 years; and pre-gestational BMI, 21.6 ± 2.4 kg/m²), who were treated with multiple daily injections of insulin. Daily insulin dose was determined from the weekly average. We examined the relationship of the change in insulin dose during pregnancy, defined as the ratio of maximum dose to that required prior to pregnancy, with maternal clinical features and pregnancy outcomes. **Results** The insulin requirement gradually increased and reached the maximum dose of 1.6 times of that prior to pregnancy, at 36 weeks of gestation. A negative correlation was observed between the duration of diabetes and the change in insulin dose, which was statistically significant ($p = 0.008$). The change in insulin dose was greater in women with multiparity than in those with nulliparity ($p = 0.047$), and was not associated with age, maternal weight, gestational weight gain, HbA1c level, diabetic complications, birth weight, or placental weight. Multiple regression analyses revealed that short duration of diabetes was an independent, related factor for the increased ratio of maximum insulin dose required during pregnancy to that required pre-pregnancy. **Conclusion** Women with a longer duration of diabetes required a slight increase in insulin dose during pregnancy. This suggests that longer duration of diabetes may lead to potentially decreased placental function.

USE OF DEGLUDEC IN PREGNANCY: A CASE REPORT

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Use of insulin degludec (Tresiba, Novo Nordisk) is expected to ensure glycemic control with low hypoglycemia risk in diabetic patients. Clinical experience of insulin degludec in pregnancy is very limited. We report the case of a 33-year-old overweight (BMI 25) woman affected by type 1 diabetes on multiple daily insulin therapy (degludec plus lispro mealtime). Patient got pregnant despite pregnancy was unplanned and not recommended because of poor glycemic control (HbA1c 55 mmol/mol at 6w). To avoid glicometabolic imbalance linked to insulin switching, patient was advised to follow her ongoing insulin therapy, after counselling about the absence of scientific data on human fetal-maternal tolerability of degludec. During pregnancy daily insulin degludec (from 23 UI to 28 UI bedtime) and lispro (from 17 UI to 25 UI mealtime according to CHO ratio) dosage was gradually increased achieving a good glycemic control (HbA1c 47 mmol/mol at 37 weeks of gestation). Monthly ultrasound showed fetal abdominal circumference over 95th pct at 34 weeks. Patient delivered by cesarean section because of failed induction at 37 weeks a macrosomic ipoglycemic female neonate, (3398 g weight, apgar score 6-6 (first and fifth minutes), cord blood ph 7.17, BE -5.8) with respiratory distress. At the 6th day of life the neonate underwent a colectomy due to a severe necrotizing enterocolitis of small and large bowel. Subsequently atypical cystic fibrosis was diagnosed. Neonatal

complications of this pregnancy were mostly linked to the suboptimal glycaemic balance and prematurity, so far no teratogenic effect of degludec has been reported.

DIABETIC PREGNANCIES PROMOTE UMBILICAL FLOW TO THE FETAL LIVER AT THE EXPENSE OF DUCTUS VENOSUS SHUNTING

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Objectives: The ductus venosus (DV) shunts well-oxygenated umbilical venous (UV) blood to the heart and brain. DV shunt up-regulation may serve as a protective mechanism particularly in intrauterine growth restriction. Diabetic pregnancies are at increased risk of fetal growth alterations and perinatal complications. This study describes the fraction of UV blood shunted through DV in diabetic fetuses. **Method:** In a longitudinal study and with ethical approval 49 women with pre-gestational diabetes underwent ultrasound examinations at gestational week 24, 28, 32 and 36. Blood velocity and mean diameter in the UV and DV were used for the calculation of blood flow volume. The degree of DV shunting was compared to a reference population (160 pregnancies). **Results:** DV shunt-fraction in diabetic pregnancies (n=125 observations) was significantly lower than in the reference group at 24 and 36 weeks, with non-overlapping 95% confidence intervals (CI): Week 24; 20.5% (CI 17-25%) vs 27% (CI 26-28%), week 28; 21 vs 23%, week 32; 19.5 vs 20% and week 36; 15% (CI 12-19%) vs 22% (CI 20-23%). **Conclusion:** Diabetic pregnancies showed a skewed development of the umbilical venous distribution prioritizing the fetal liver and down-regulating DV shunt fraction at week 24 and 36. We speculate that the continuous high priority of the fetal liver is linked to macrosomic growth and that the low degree of DV shunting may be a disadvantage to the fetus near term and during labor.

THE DETERMINANTS OF MATERNAL NEAR MISS (MNM) AND POTENTIALLY LIFE-THREATENING CONDITIONS (PLTC) AMONG PATIENTS WITH TYPE 1 DIABETES.

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Background: Maternal near miss (MNM) is defined as a woman who almost died but survived severe complications during pregnancy, delivery or the puerperium. PLTC refers to serious situations that can cause MNM or maternal death. Type 1 diabetes mellitus is known for its severe gestational implications and in-depth study of the MNM or PLTC criteria, most commonly found among these patients, may be helpful in improving care. **Objective:** To analyze which criteria for MNM and PLTC were more prevalent among type 1 diabetic pregnant. **Methods:** Secondary analysis of retrospective data collected from medical records of type 1 diabetic pregnant. **Results:** There were 8 cases of maternal near miss and 51 PLTC from 137 pregnancies. Among MNM cases, two fulfilled “seizure without control” as definition criteria, one presented “creatinine above 3,5 mg/dl”, one “lactate 5” and four “ketoacids on the urine in patients without conscience”. The most frequent complications were: renal insufficiency (50%) and severe hypertension (37,5%). 25% of MNM cases were admitted to intensive care units and all of them were hospitalized for more than 7 days. Among the patients with PLTC, 97.6% were hospitalized for more than 7 days, 19.5% had blood transfusion. 31.37% had, at least, one complication related to hypertension, including 11 cases of severe preeclampsia and 4 HELLP syndrome. **Conclusion:** In this study, the most frequent MNM criteria was “ketoacids on the urine in patients without conscience” and most frequent PLTC criteria were “hospitalization 7 days” and hypertensive complication.

TYPE 1 DIABETES PREGNANCY AND DIFFERENT REGIMENS OF INSULIN THERAPY: DOES IT MAKE A DIFFERENCE?

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OBJECTIVE To assess the pregnancy outcomes of women with T1DM according to type of insulin administration: multiple dose (MDI) versus continuous subcutaneous infusion (CSII). **STUDY DESIGN** We retrospectively reviewed data of patients affected by T1DM followed in our clinic between Jan 2006 and Dec 2015. Women were divided in two groups according to type of insulin administration: MDI (N=50) and CSII (N=51). Maternal and neonatal outcomes were compared. Data were analyzed by t-test and Fisher test; p0.05 was considered significant. **RESULTS** Patients in the CSII group were older (33,5vs30,5;p0.001), with a longer duration (17,2vs9,4;p0.001) and more complications (25vs7;p 0.001) correlated to the diabetes. HbA1c levels were higher in the CSII group during the second and third pregnancy trimester (table 1). Obstetric and neonatal outcomes were similar between the two groups. No differences were found in rate of preeclampsia, preterm delivery, need of hospitalization for poor metabolic control, mode and gestational age at delivery and adverse neonatal outcomes (LGA neonates, umbilical artery pH 7.10, Apgar 7 at 5', shoulder dystocia, RDS, jaundice, hypoglycemia). **CONCLUSION** Despite patients with CSII were characterized by a more complicated pre-pregnancy condition and a poorer glycemic control they could achieve similar obstetrics and neonatal outcomes. CSII can be a safe and effective option to treat patients affected by T1DM.

TABLE 1

NEONATAL NEAR MISS (NNM) AND NEONATAL OUTCOMES IN NEWBORNS OF TYPE 1 DIABETIC MOTHERS.

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Background: Both type 1 diabetic pregnant and their newborns are formally known to be more likely to face severe clinical situations. That is why studying the morbidity of them is so important. A new concept called “Neonatal Near Miss “ (NNM) has been emerging with this objective. However, there are still no established criteria worldwide. NNM refers to that newborn who presented serious complications during the 27 first days of life (dysfunction or organic failure), but survived this period despite the gravity. **Objective:** To analyze the perinatal outcomes of the concepts of type 1 diabetic patients attended in a Brazilian University Hospital from 2005 to 2015. **Methods:** Secondary analysis of data collected from medical records and application of NNM criteria proposed by Santos et al (2015) which was based on the WHO criteria for Maternal Near Miss (MNM). **Results:** There were 122 newborns of type 1 diabetic mothers. Among the cases, 9 (7.37%) had death as outcome and 35 presented at least one NNM criterion, computing 28,6% of NNM prevalence. Newborns of mothers with Maternal Near Miss (MNM) had a higher occurrence of NNM (62.5%) when compared to concepts from patients without maternal outcomes (p0.01). “Need for nasal CPAP” was the most frequent NNM criterion (65%) and the second one was “need for orotracheal intubation” (63%). **Conclusion:** In this study, MNM determined a higher occurrence of NNM, and most cases of neonatal near miss were related to respiratory disorders and prematurity. This observation can help us to improve the assistance.

SEVERE MATERNAL MORBIDITY IN TYPE 1 DIABETIC PREGNANT: WHICH FACTORS ARE ASSOCIATED?

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Background: Severe maternal morbidity (SMM) was introduced to complement information on maternal health and it encompasses “maternal death”, “maternal near miss” (MNM) and “potentially life-threatening conditions” (PLTC). MNM definition is: woman who almost died but survived complications during pregnancy, delivery or within 42 days postpartum. PLTC are critical situations that can lead to MNM or maternal death. Type 1 diabetes is previously known to be associated with very severe pregnancies and therefore, the study of its outcomes are crucial for the implementation of health policies. **Objective:** Analyze which maternal and fetal factors are involved with PLTC and MNM in type 1 diabetic patients. **Methods:** Secondary analysis of medical records of type 1 diabetic pregnant attended at a Brazilian university Hospital from 2005 to 2015 and identification of MNM and PLTC according to the World Health Organization criteria. Patients with MNM and PLTC were compared separately to the group without complications and differences between them were assessed by using the chi-square test with a 95%IC. **Results:** There were 137 type 1 diabetic pregnant, including 8 MNM and 51 PLTC. Nulliparity was significant in the determination of PLTC ($p=0.036$). 87.5% of MNM group had parturition before 34 weeks ($p<0.01$) and 76.47% of PLTC before 37 ($p=0.03$). Patients with MNM and PLTC had more newborns with low birth weight ($p=0.03$). MNM and PLTC pregnant were more days hospitalized ($p<0.001$). **Conclusion:** SMM in diabetes type 1 were associated with nulliparity, premature labor, low weight at birth and longer length of hospital stay.

ATHEROGENIC LIPID PROFILE IN PREGNANCIES COMPLICATED BY TYPE 1 DIABETES AND IMPAIRED AWARENESS OF HYPOGLYCEMIA

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Aim:Exacerbation of the physiological atherogenic lipid profile during pregnancy in patients with type 1 diabetes(T1D) has been associated with adverse pregnancy outcomes. It is unknown if the greater inflammation described previously in patients with T1D and repeated and impaired awareness of hypoglycemia(IAH) could have a negative impact in this period. Therefore, the aim of our study was to evaluate the lipid profile in pregnant women with T1D with or without IAH.

Methods:Retrospective cohort longitudinal study. After sample-size calculation, women with T1D with follow-up in a tertiary Hospital were selected. The Clarke test in the first obstetrical visit was used to evaluate hypoglycemia awareness(≥ 3 points=IAH). The lipid profile(total cholesterol, LDL-cholesterol, HDL-cholesterol and triglycerides) before pregnancy and in every trimester of pregnancy was studied. **Results:**A total of 47 women with T1D(15 with IAH;32 with normal awareness)were studied (34.3 \pm 4.1years old, 18.2 \pm 9.0years of T1D duration, without differences between groups). During pregnancy, no differences were found in HbA_{1c}, events of severe and non-severe hypoglycemia, weight gain and adverse pregnancy outcomes. IAH group had higher triglycerides(163.21 \pm 74.35 vs. 127.04 \pm 33.01mg/dl; $p=0.047$) and lower HDL-cholesterol (73.14 \pm 18.05 vs. 82.85 \pm 14.75; $p=0.05$) in the second trimester. The longitudinal study showed a higher increase in triglycerides from first to second-trimester($p=0.042$) and a lower decrease in LDL-cholesterol from pregestational visit to first-trimester($p=0.041$) in IAH group. **Conclusions:** IAH was associated with a potentially atherogenic lipid profile in T1D pregnant, independently of glycemic control. Additional studies are needed to check if the differences found in this subgroup of patients, would be associated with adverse pregnancy outcomes.

THE RELATIONSHIPS BETWEEN LIPID AND METABOLIC PROFILE AND 3D PLACENTAL POWER DOPPLER INDICES AT EARLY PREGNANCY IN WOMEN WITH PREGESTATIONAL DIABETES

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Objective. To evaluate first trimester lipid profile and metabolic control and their relationships with placental power-Doppler indices in women with pregestational diabetes. **Material and Methods.** Prospective case-control study about women with physiologic pregnancies (n= 27) and women with pregestational diabetes (n=10). Three dimensional placental volume and vascularization indices (FI, VI and VFI) were measured at the time of the first trimester (gestational age 12.2 ± 0.5 and 12.2 ± 1.0 weeks, respectively). At the same time, maternal plasma lipid profile (total cholesterol, HDLc, HDL/total cholesterol ratio, LDLc and triglycerides levels) and glycaemia and glycosylated haemoglobin were measured. Comparisons between two groups were performed by using the Student t test. The relationships between variables were analyzed using Pearson's correlation coefficient. **Results.** There were significant differences in placental volumes and glycosylated haemoglobin levels between the studied groups (p=0.001), with higher values in the diabetic group. There were significant correlations between placental volume and birthweight centile in both groups (r= 0.77, p=0.009 and r=0.78, p=0.003, for normal and diabetic group, respectively). In the control group there were significant correlations between FI and LDLc levels (r=0.44, p=0.02) and between FI and cholesterol/HDLc ratio (r=0.46, p=0.001). In the diabetic group a negative correlation was found between VFI and glycaemia (r= - 0.74, p= 0.03). **Conclusions.** High glucose levels may impact negatively placental vascularization in women with pregestational diabetes since early pregnancy.

PORTRAIT OF WOMEN WITH TYPE 1 OR TYPE 2 DIABETES OF CHILDBEARING AGE ATTENDING DIABETES CLINICS IN ITALY: THE AMD-ANNALS INITIATIVE.

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In Italy still only a minority of women with diabetes plan their pregnancies. We report characteristics relevant in case of an unplanned pregnancy among over 14,000 women with type 1 (T1DM) or type 2 (T2DM) diabetes attending in 2011 diabetes clinics of the AMD-Annals initiative (300 clinics caring for 560,000 patients). The proportion of women with T2DM increased from 30.8% (95% CI: 29.9 to 32.4) to 67.5% (66.6 to 68.5) from age 18-30 years to age 36-45 years. Almost half of the women with T2DM were taking diabetes drugs not approved during pregnancy. The proportion of women with an

HbA1c 7.0% was 20.0% (20.0 to 20.8) and 43.4% (42.8 to 43.9) for those with T1DM or T2DM, respectively. Furthermore, 46.7% (47.0 to 48.3) of women with T1DM and 33.5% (33.9 to 35.0) with T2DM had HbA1c \geq 8.0%. The prevalence of obesity (BMI \geq 30) was 7-fold higher among women with T2DM than T1DM [7.4% (7.2 to 7.5) and 49.9% (49.4 to 50.5), respectively]. Women with T2DM were more likely to have hypertension or microalbuminuria than women with T1DM. At least one unfavorable condition for starting a pregnancy was present in 51% of women of childbearing age with T1DM and in 66.7% of those with T2DM. In the setting of diabetes clinics in Italy, women of childbearing age with either T1DM or T2DM were far from the ideal medical condition for conceiving a child. Our data strongly support the need for counselling all women with diabetes of childbearing age about pregnancy and pregnancy planning.

CHARACTERISTICS AND PREGNANCY OUTCOMES OF WOMEN WITH PRE-GESTATIONAL DIABETES WHO DELIVERED IN LOMBARDY IN 2012-2014: THE SWEET BABY STUDY

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In Italy population-based data on outcomes of pregnancies complicated by diabetes are not available. Aim of the study was to describe outcome of pregnancy of women with pre-gestational diabetes who delivered between 01.01.2012 and 31.12.2014 in Lombardy (10 million inhabitants, 28% of deliveries from immigrant mothers). Data on 454 pregnancies complicated by T1DM or T2DM were retrospectively collected from 16 diabetes & pregnancy clinics. Women with T2DM (n=154, 33%) were older (36 vs 33 year), with shorter diabetes duration (3 vs 14 year), more likely to be obese (36.2% vs 7.2%), hypertensive (7.4% vs 1.5%), immigrant (57.1% vs 19.3%), less likely to plan their pregnancies (17.2% vs 45.7%), with lower HbA1c at booking (48 vs 54 mmol/mol) compared to women with T1DM (n=300). Among women with T1DM 47% were on CSII. Median HbA1c improved during pregnancy, although third trimester HbA1c was higher than second trimester HbA1c, with most women never reaching HbA1c 42mmol/mol. Women who planned their pregnancies had lower HbA1c throughout pregnancy. Eight pregnancies resulted in stillbirth, 5 (16.80/00) in women with T1DM and 3 (19.50/00) in women with T2DM (reference 2.490/00). Two perinatal deaths were reported (4.410/00, reference 3.50/00). None of the pregnancies ending with stillbirth or perinatal death was planned. Pregnancies in women with pre-gestational diabetes bear considerable unfavorable outcomes, especially when pregnancy is unplanned. Monitoring outcomes of these pregnancies at regional level will inform healthcare professionals and women about the risks in the local setting and might identify weaknesses and strengths in care delivery.

TAKE PARITY INTO CONSIDERATION WHEN TREATING PREGNANT WOMEN WITH TYPE 1 DIABETES

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The changing insulin resistance during pregnancy is a challenge for both patients and clinicians. The aim of the current study was to evaluate the insulin requirements in women with T1DM during pregnancy. We conducted a retrospective cohort study consisting of women with T1DM who gave birth at Aarhus University Hospital between January 2004 and December 2014. Data on daily insulin requirements and HbA1c were collected at every visit during pregnancy. Pre-pregnancy data constituted BMI, parity, age, daily insulin requirement, last known HbA1c and diabetes duration.

380 women with a total of 536 pregnancies were included in the study. The mean age was 31.1 y, pre-pregnancy HbA1c 59,7 mmol/L, pre-pregnancy BMI 25.1 and duration of diabetes 15.2 y. Parity was as follows: P0=43 %, P1=40 %, P2=14 % and P3+P4=3%. Insulin requirements from week 11-16 decreased significantly with 4% and rose significantly from week 19 to delivery with a peak at week 33-36 at 70 % compared to pre-pregnancy insulin requirement. Insulin requirements increased with parity as the unadjusted difference between P0 and P1, P2 and P3+4 were 9, 12 and 23% (p=0.000) respectively. Adjusting for age, BMI and pre-pregnancy HbA1c emphasized the findings to 13, 21 and 34 % (p=0.000) and an additional significant difference between P1 and P3+4 at 19% (p=0.019) was found. This large study shows that especially parity must be taken into account when treating this group of patients. Our findings could be useful in the development of a treatment algorithm for optimizing treatment of pregnant women with T1DM.

AWARENESS OF THE IMPORTANCE OF PREGESTATIONAL DIABETES CONTROL IN TYPE 1 DIABETIC FERTILE WOMEN

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For women with DM1 who intend on having children, pregestational control is vital to reduce the risk of maternal/neonatal complications. One objective of diabetic education is to inform patients about this theme. Objective: To assess the DM1 patient's knowledge about the importance of metabolic control before and during their pregnancy. Patients and methods: Women with DM1 who had received diabetic education, filled in questionnaires to assess their knowledge about their condition and how it affects pregnancy. Results: 54 women with DM1 agreed to participate, (median age 36.57 +/- 8.1 years old, median age of DM1 diagnosis 20.1 +/- 10 years) 68% reported receiving information about DM and pregnancy. 96% thought DM could impair pregnancy. 29% of them didn't use contraception. 77% had previous pregnancies. Pregestational control was attended by 31% of patients during their 1st pregnancy, 50% during their 2nd and 75% during their 3rd. Neonatal outcomes: 1st pregnancy (32): 5 miscarriages, 2 abortions, 2 preterm babies, 1 hyperbilirubinemia; 2nd pregnancy (16): 2 abortions, 4 macrosomas, 1 kidney malformation; 3rd pregnancy (4): 1 heart malformation.

57% wouldn't consult their endocrinologist/diabetes nurse before a new pregnancy. Conclusions: In this sample, although they were aware of the potential risk of DM in pregnancy, few women attended pregestational care at the 1st pregnancy and half wouldn't attend in future. We must encourage women with DM1 to learn about metabolic control prior to gestation.

Pre Natal Diagnosis

RELATION OF PSYCHO-SOCIAL HEALTH STATUS OF PREGNANT WOMEN WITH THE RISK OF DEPRESSION

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Objective: Pregnancy is a natural phenomenon which starts with insemination and ends with child delivery, in which physiological, psychological and social changes occur. This research was made in order to determine the relation of psycho-social health status of pregnant women with the risk of depression. **Material and methods:** 792 pregnant women over age 18 comprised the study group of the research, which was planned in descriptive and relation searching type. In data collection, a 21-question questionnaire developed by the researcher, "Pregnancy Psychosocial Health Assessment Scale" (PPHAS) and "Edinburgh Postnatal Depression Scale" (EPDS) were used. **Results:** It was found that EPDS score average of the pregnant women was 9.41 ± 4.81 , the rate of depression risk was %28.2. When risk rates according to trimesters were examined; it was determined that the depression risk was %31.5 in the first trimester, %26.8 in second trimester and %28.9 in the third trimester. It was detected that the total PPHAS score average of the pregnant women was 4.05 ± 0.45 and their psycho-social health status was in high level. When the relationship between the PPHAS total and sub-dimension averages (pregnancy and spouse relation, anxiety and stress, domestic violence, psycho-social support need, family properties, physical- psycho-social changes regarding pregnancy) and EPDS score averages was examined, a negative way, statistically meaningful relationship was detected ($p < 0.05$). **Conclusion:** As a result, as the scores of pregnant women regarding psycho-social health decrease, the prenatal depression risk was detected to rise.

CHALLENGES OF COMMUNITY GENETIC SERVICES IN IRAN AT A GLANCE

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Background: Data on the rate of congenital disorders (CD) in Iran is sparse. Insufficient birth defects registration or surveillance system of fetuses and infants lead to scarce comprehensive data about the prevalence of CD. But there are two salient points in management of prevalence of these disorders in Iran: Availability and utilization of Community genetic services (CGS). The aim of this study was to introduce CGS in Iran and to clarify its utilization challenges.

Methods: In this study, data related to levels of CGS were collected using a checklist from 10 public and private hospitals and 15 health centers. Additionally, 30 participants were interviewed to clarify challenges in CGS utilization using in depth semi-structured interview. **Results:** Preconception care is the major part of primary prevention in health centers in Iran. A component of CGS in secondary prevention level includes routinely screening of metabolic disorders during 3-5 days after births of all newborns and fetal disorders screening during pregnancy. Rehabilitation programs for learning disabilities, cognitive impairment, and musculoskeletal defects are the main parts of CGS in tertiary prevention levels in Iran. Due to high cost of CGS and low insurance coverage, many people cannot utilize despite their availability. Besides, "genetic literacy" level among general public is an important factor contributing to the success of CGS. **Conclusion:** It seems that public awareness increase through planning community educational programs about congenital disorders, and sufficient insurance coverage to CGS could decrease the current impediments that are limiting the access to CGS in Iran.

TWO CASES OF FETAL NON-DELETIONAL HAEMOGLOBIN H DISEASE

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We present two cases of haemoglobin-H Quong Sze (QS) disease diagnosed in prenatal period and review prenatal presentation and outcome of non-deletional haemoglobin-H (Hb H) disease. Couples of both cases were heterozygous for Hb Quong Sze and alpha thalassemia-1 trait. Prenatal scan revealed elevated middle cerebral artery peak systolic velocity (MCA PSV) and mild cardiomegaly at 17 to 20 weeks. Amniocentesis confirmed fetal Hb H QS disease for both fetuses. Serial scan showed mildly elevated MCA PSV with no hydrops. Both cases were managed conservatively with serial ultrasound surveillance. One baby was born prematurely at 34 weeks due to preterm labour. Her haemoglobin level was 7g/dL at birth and she received exchange transfusion. Subsequent haemoglobin ranged from 8 to 9 g/dL and baby did not require further transfusion. The other baby was born at term with haemoglobin 11.4 g/dL at birth and did not require transfusion. Hb QS is a type of non-deletional alpha thalassemia. Prenatal features of Hb H QS disease include mildly elevated MCA PSV and mild cardiomegaly. Postnatal features include varying degree of anaemia, some may require transfusion, iron overload, growth retardation, hepatosplenomegaly and cholelithiasis. Prenatal cases of Hb H QS disease can be managed with serial ultrasound to monitor MCA PSV, cardiothoracic ratio and signs of hydrops. Cordocentesis and in-utero transfusion are rarely indicated, unless there is hydrops, worsening cardiomegaly or grossly elevated MCA PSV. Postnatal outcome is usually favourable but individuals with non-deletional Hb H disease are usually more anaemic than deletional type.

THE ROLE OF ANTENATAL DIAGNOSIS IN CONGENITAL HEART DISEASE. CASE PRESENTATION

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Interrupted aortic arch is a rare congenital heart disease (1% of congenital heart diseases), very rarely diagnosed in the fetus. Of the three types, B type (aortic arch interrupted between left common carotid artery and left subclavian artery) is the most frequent (55% of cases). It is associated with ventricular septal defect (VSD) in 90% of cases and Di George Syndrome in 50% of cases. We present a newborn antenatally diagnosed with interrupted aortic arch and VSD. Amniotic fluid genetic testing revealed the deletion of 22q11.2 (Di George Syndrome). Spontaneously born at term, with good postnatal adaptation, he was transferred in a pediatric cardiac surgery unit, under prostaglandin treatment. Echocardiography confirmed type B interrupted aortic arch, VSD, bicuspid hypoplastic aortic valve, patent foramen ovale and patent ductus arteriosus. Surgical intervention in the 5th day of life reconstructed the aortic arch and closed the VSD, atrial septal defect and ductus arteriosus. After surgery the newborn was hemodynamically stable with moderate inotrope support. The evolution was slowly favorable, in the 19th postoperative day he was transferred to the pediatric cardiology unit. 3 weeks after surgery he developed a Staphylococcus epidermidis sepsis, which resolved under antibiotic treatment.

The final postoperative echocardiography revealed a good cardiac function. The short and long term cardiac prognosis is good, but in this newborn it is encumbered by the association of 22q11.2deletion. The antenatal diagnosis and prompt surgical intervention in a specialised unit offers a good survival chance for children with rare congenital heart disease.

PRENATAL DIAGNOSIS OF PROBOSCIS LATERALIS

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Introduction Proboscis lateralis is a rare congenital anomaly characterized by the presence of a tubular rudiment that originates from the medial portion of the orbital roof. The incidence is less than 0.1 per 10000 newborns. Here we report a case of proboscis lateralis diagnosed prenatally. Case report This is a 28 year old gravida 2 woman who was seen at the mid-trimester morphological scan. A tubular appendage originating from the inner border of the left orbit was detected measuring 8x11 mm in association with an ipsilateral heminasal aplasia and a small fissure of the left lip. The size and morphology of both orbits and brain structures were adequate for gestational age. Fetal karyotyping was normal. The patient wanted to carry on with her gestation. MRI did not detect any other additional findings. Our Maxillofacial Surgery Unit informed the patient of the postnatal surgical procedure. The growth of the facial bones and the development of brain structures were adequate. The patient gave birth by caesarean to a girl weighing 3220 g. The postnatal study confirmed the findings detected prenatally. The first corrective surgery performed was at three months of life by our maxillofacial surgery unit. The neurological development of the girl in the first months of life is normal.

Conclusions The diagnosis of proboscis lateralis implies a detailed study of the orbits and brain structures, as well as control of the growth of facial bony structures. Early surgical correction should be performed to avoid psychological consequences due to deformity.

LARYNGEAL ATRESIA ASSOCIATED WITH OESOPHAGEAL FISTULA

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Introduction Obstruction of the upper respiratory tract (trachea/larynx) occurs due to atresia, stenosis or the presence of a membrane. The prenatal diagnosis is relatively simple. It presents with very significant and characteristic ultrasound features. The prognosis is bad presenting a very high mortality rate. We report a case of prenatal diagnosis of a suspected oesophageal atresia and postnatal diagnosis of laryngeal atresia. Case report This gravid woman did not present any major morphological anomalies at mid-trimester scan. She was referred to our unit at 28 weeks gestation due to non-visualization of the gastric chamber and polyhydramnios. A small gastric chamber and severe polyhydramnios were confirmed. The suspected diagnosis of oesophageal atresia with tracheoesophageal fistula was suspected. Two amnioreductions were performed due to maternal discomfort (4000 and 5000 cc of amniotic fluid were obtained respectively). Caesarean section was performed with 40 weeks + 3 for foetal distress giving birth to a male of 2370 g with Apgar score of 1-1-0 and umbilical cord arterial and venous pH of 7,19 and 7,26 respectively. The newborn died after inability of pulmonary ventilation and intubation. The postmortem radiological study and necropsy confirmed the presence of laryngeal atresia with esophageal fistula. Conclusion Laryngeal / tracheal atresia has a poor prognosis. Its prenatal diagnosis permits to offer abortion or to plan the delivery, which is essential for the survival of the newborn.

Its association with esophageal fistula decompresses the lungs which can lead to underdiagnosis until birth. Prenatal MRI could improve prenatal diagnosis in these cases.

AMNIOCENTESIS FOR MATERNAL AGE

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Objective: To investigate the rates of fetal chromosomal abnormalities in advanced maternal age women and to use the results of this study for genetic counseling of other women of the same age. **Methods:** All women with second trimester amniocentesis and fetal karyotype aged ≥ 35 years with a naturally conceived, singleton pregnancy, with no personal or family history of chromosomal abnormalities and no fetal abnormalities detected by ultrasound or other indications of an unfavourable prenatal diagnosis, were included in our study. **Results:** From 2005 to 2016, the rate of women of advanced maternal age undergoing prenatal diagnosis was 57.32% (1080 amniocentesis from a total of 1884). 149 women were excluded for not meeting the inclusion criteria and the study group consisted of 931 women. The mean age was 38.1 years (range, 35-46 years). The chromosome results were normal in 93% (866/931) of cases, Down's syndrome in 4% (37/931) and Edwards syndrome in 3% (28/931). The outcome of pregnancies was: live births 92% (856/931), stillbirths at 30 to 35 weeks 0.5% (5/931), miscarriages 0.5% (5/931 at 19 weeks, 3 weeks after the amniocentesis), terminations 7% (65/931, due to chromosomal abnormalities). 837 women delivered at term (89.9%) and 94 women (10.1%) delivered preterm. **Conclusions:** The results of our study come to agreement with international standards and may assist in genetic counseling of advanced maternal age pregnant women, and provide a basis for the selection of prenatal screening and diagnostic technologies. Also the complications rate (0.5% miscarriage rate) is acceptable.

Preterm Delivery/PPROM

QUANTITATIVE ANALYSIS OF THE CERVICAL TEXTURE BY ULTRASOUND IN THE MID-PREGNANCY AND THE ASSOCIATION WITH SPONTANEOUS PRETERM BIRTH

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Objective: We aimed to determine if there is an association between quantitative analysis of the cervical textures (CTx) by ultrasound in the mid-trimester of pregnancy and sPTB 37 weeks. **Methods:** Nested case-control study from a prospective cohort of 677 singleton pregnancies between 19.0 and 24.6 weeks. Women who delivered 37 weeks (sPTB) were considered as cases and were matched with controls who delivered at term (10:1 for cases). Cervical length (CL) was measured off-line and a region of interest was delineated in the mid portion of the anterior cervical lip to be used for CTx analysis. A learning algorithm was developed to obtain the best combination of cervical textures features associated with sPTB. Its ability to predict sPTB was evaluated using a leave-one-out cross-validation technique, obtaining a CTx-based score for each individual. ROC curves for CTx-based score and CL were drawn. **Results:** 27 cases and 283 controls were included. Median CTx-based score (-1.01 vs -0.07, $p=0.0001$) was significantly inferior in cases compared to controls and maintained its significant association with sPTB after adjusting for possible confounders. CTx-based score AUC's ability to identify sPTB (0.77; 95% CI 0.66-0.87) was significantly better than CL AUC's (0.60; 95% CI 0.47-0.72), $p=0.03$. Median CL was similar (37.7 vs 38.6, $p=0.26$) for cases and controls yet cases were more likely to have a CL ≥ 25 mm (18.5% vs 0.4%, $p=0.0001$). **Conclusion:** Quantitative analysis of

the cervical texture is able to extract information from the ultrasound images related to sPTB and generate a CTx-based score which is independently associated to sPTB.

MATERNAL CHARACTERISTICS ASSESSMENT AND PERINATAL OUTCOMES OF OBSTETRIC CERCLAGES DUE TO CERVICAL INSUFFICIENCY PERFORMED AT A REGIONAL PERINATAL REFERRAL CENTER IN NORTHERN CHILE. 3 YEARS STUDY.

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INTRODUCTION: The preterm birth syndrome is of great importance in perinatal morbidity and mortality, with an incidence of 7.35% in Chile. 10% of these cases correspond to cervical incompetence. We defined as primary objective to determine the gestational age (GA) at delivery in patients submitted to cervical cerclage. **MATERIAL AND METHOD:** A cross-sectional, retrospective descriptive study was performed in patients submitted to cervical cerclage at the Hospital de La Serena, Chile, between July 2013 and July 2016, analyzing maternal and perinatal antecedents such as: gestational age (GA) at birth, newborn weight (NBW) and Apgar at 5 minutes. **RESULTS:** We obtained 43 cerclated patients, divided into: prophylactic (44.1%), therapeutic (23.4%) and emergency (32.5%). The prophylactic cerclage presented averages of: cervicometry of 37.95 mms, GA at the intervention of 14 + 5 weeks, GA at delivery of 35 + 6, NBW of 2.754 grams. and Apgar score of 9. Therapeutic cerclage presented averages of: previous cervicometry of 8.77 ms, GA at the time of the intervention of 22 weeks, GA at delivery of 35 weeks, NBW 2.670 g. And Apgar of 9. Emergency cerclage presented averages of: cervical dilation prior to cerclage of 2.85 cms., GA at intervention of 24 weeks, GA at delivery of 30 + 4 weeks, NBW 1.768 grs. And Apgar score of 7. **CONCLUSIONS:** Cervical cerclage was an effective tool to achieve deliveries between 30 to 35 weeks in the different groups, presenting satisfactory perinatal outcomes in Apgar and RN weight.

PREECLAMPSIA AND FETAL GROWTH RESTRICTION IN HIGH RISK OF PRETERM BIRTH PREGNANCIES

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Objective The aim of the study is to describe the incidence of preeclampsia and fetal growth restriction (FGR) in women with high-risk of preterm birth (PTB) follow-up in our preterm birth prevention clinic (PBPC) during 4 years and their perinatal outcomes **Methods** A retrospective observational study was conducted. We collected information of all women with high risk of PTB that developed preeclampsia or FGR during pregnancy. **Results** 401 women had been managed in our PBPC; of these, 5 (1,25%) developed a preeclampsia and 34 (5,73%) were diagnosed with FGR (8,48%). 323 pregnancies (80,5%) were normal in terms of preeclampsia and birth weight. 39 (9,72%) cases were lost to follow-up because the delivery didn't occur in our centre. Median gestational age at delivery in our high-risk population was 38¹ (15³- 41⁵) weeks of gestation, in pregnancies complicated with preeclampsia was 35² (33⁴-38¹) weeks and in FGR group was 36⁶ (28³-40¹) weeks. In preeclampsia group, 4 fetuses (80%) were born before 37 weeks, from those; about 50% (2/4) due to spontaneous preterm birth and with normal perinatal outcomes. In women diagnosed with FGR, 18 (52,9%) delivered prematurely and about 55,6% (10/18) occurred spontaneously with neonatal survival rate about 100%. In our high-risk population, the delivery was produced before 37 weeks in 100 (31%) pregnancies and about 72% started spontaneously (72/100). **Conclusion** The incidence of preeclampsia

and FGR is not increased in our high-risk of PTB pregnancies with normal perinatal outcomes. A case-control trial is needed to find statistically significant differences.

IMPACT OF MICROBIAL INVASION OF THE AMNIOTIC CAVITY AND INTRA-AMNIOTIC INFLAMMATION ON SHORT-TERM NEONATAL OUTCOME IN WOMEN WITH PRETERM PRELABOUR RUPTURE OF MEMBRANES

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Objective There has been reported four phenotypes of women with preterm prelabour rupture of membranes (PPROM) according to the presence of microbial invasion of the amniotic cavity (MIAC) and/or intra-amniotic inflammation (IAI). Our aim was to evaluate the impact of these phenotypes on short-term neonatal outcome when gestational age (GA) was considered. **Study design** Prospective cohort study including singleton pregnancies with PPRM 34.0 weeks. MIAC was defined as a positive amniotic fluid aerobic/anaerobic/genital *Mycoplasma* culture and IAI based on interleukin (IL)-6 levels. Short-term neonatal outcome was adjusted for GA at delivery. **Results** Among 117 women evaluated, microbial-associated IAI and “sterile” IAI occurred in 29% and 39%, respectively. Only two women (2%) had MIAC without IAI. No differences were observed in any of maternal or short-term neonatal outcomes evaluated between women with “sterile” IAI and the “No-MIAC/No-IAI” group. Significantly earlier GA at PPRM, at sampling, at delivery, a higher CRP at admission and a higher rate of preterm delivery before 28.0 and 32.0 weeks were found in women with microbial-associated IAI when were compared with the others groups. Women with “No-MIAC/No-IAI” had the highest rate of respiratory distress syndrome. No other differences in short-term neonatal outcome were observed after adjustment for GA at delivery. **Conclusion** An earlier GA at delivery was found in women with MIAC-associated IAI. When gestational age was considered, a significantly lower risk of respiratory distress syndrome was observed in women with either MIAC or IAI when were compared with the “No-MIAC/No-IAI” group.

PROGESTERONE IN PTB: PHARMACODYNAMICS AND ROUTE OF ADMINISTRATION

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Preterm labour and birth (PTB) is associated with intrauterine and fetal inflammation with or without infection. Progesterone (P4) inhibits inflammatory responses and promotes myometrial relaxation. The onset of labour at term is associated with functional P4 withdrawal. The decrease of the P4 activity may become possible through the occurrence of modified isoforms PRB & PRA, modifications of the adjustment of the P4 receptor through transcription factors or through non-genomic effect of P4. P4 induces a stimulation of NOS1 and inhibits the formation of gap junctions. P4 and its metabolites induce uterine quiescence through interactions between nuclear and membrane P4 receptors. It is also proven that P4 and its metabolites has non-genomic effects, ie relaxing effects on uterine contractility linked to the blockage of calcium influx and interact with some membrane receptors (GABA-A and oxytocin receptors). Oral administered P4 undergoes several successive metabolism steps in the gut (5b-reductase activity), in the intestinal wall (5a-reductase activity) and in the liver (reductase and hydroxylase activities). 5a-pregnanolone and 5b-pregnanolone bind GABA A receptor. After vaginal administration, only a small increase in 5a-pregnanolone is observed and 5b-pregnanolone levels are not affected. There is strong biological plausibility to support exogenous vaginal P4 for the management of prevention of preterm birth in women at risk ie with a short cervix at midgestation

and/or a history of preterm delivery. The optimal dose, route of administration and duration remains to be determined in symptomatic women and in pregnancy maintenance after tocolysis.

CERVICAL ALFA-ACTININ-4 IS UP-REGULATED IN WOMEN WITH PRETERM LABOR AND MICROBIAL INVASION OF THE AMNIOTIC CAVITY

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Objective: To characterize the proteome profile of women with preterm labor and intact membranes (PTL) below 34.0 weeks with and without microbial invasion of the amniotic cavity (MIAC) using mass spectrometry in the amniotic fluid (AF) and Western blot analysis in the cervical mucus and the vaginal fluid. **Materials and methods:** *Discovery phase:* case-control study. Eight women with MIAC and 7 without matched by gestational age at sampling. Proteomic profile characterization was performed using the LTQ VELOS Orbitrap mass spectrometer in the AF. *Validation phase:* In a prospective cohort of 109 women, a selection of the proteins differentially expressed by mass spectrometry was validated by Western blot analysis in the genital samples. **Results:** The mass spectrometry analysis identified a total of 444 proteins. Sixteen were chosen for validation being involved in defense (calgranulin A, B, C, C-reactive protein), cytoskeletal remodeling (alfa-actinin-4 (ACTN-4), plastin-2, α 2-antiplasmin, vitronectin), metabolism (cystatin- β , glucose 6 phosphate isomerase, glutathione S-transferase, prostaglandin D2 synthase, corticosteroid binding globulin) and vascular (α 1-antichymotrypsin, hemopexin, endosialin) pathways. Among them, cervical ACTN-4 was significantly up-regulated in women with MIAC with an odds ratio of 6.8 ($p=0.002$). **Conclusions:** Cervical ACTN-4 was significantly up-regulated in the group of women with PTL with MIAC.

COMPARISON OF AMNIOTIC FLUID CULTURE AND 16S R-RNA SEQUENCE TO PREDICT AN ADVERSE NEONATAL AND MATERNAL OUTCOME IN WOMEN WITH PRETERM LABOR AND INTACT MEMBRANES.

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Introduction: Majority of clinical settings diagnose microbial invasion of the amniotic cavity (MIAC) based on amniotic fluid (AF) culture results. Sequencing the small-subunit ribosomal RNA (16S rRNA) gene allows to identify difficult-to-cultivate microorganisms increasing the accuracy to identify MIAC. However, it remains to be further evaluated whether these genomic techniques improve the prediction of adverse outcomes related to infection. **Objective:** To compare AF culture and 16S rRNA sequence analysis for the prediction of spontaneous preterm delivery in the following 48h, clinical chorioamnionitis and funisitis. **Methodology:** Prospective cohort study including singleton pregnancies admitted with preterm labor and intact membranes with an amniocentesis to rule out MIAC. Culture for genital *Mycoplasma*/aerobic/anaerobic bacteria was performed immediately after amniocentesis and PCR targeting the 16S rRNA gene was analysed in frozen samples in a second face. Diagnostic indices to predict adverse outcomes related to infection were compared. **Results:** From 2009-2015, 72

women were included. Ten had a positive AF culture (14%) and 16 a positive 16S rRNA sequence result (22%). Nineteen women (26%) delivered in the following 48 h, 5 (7%) had clinical chorioamnionitis and 13/39 (33%) funisitis. Diagnostic indices were higher when culture and 16S rRNA were combined (S to predict delivery 48h was of 58% and Sp of 91%. S to predict clinical chorioamnionitis was of 80% and Sp of 81%. S to predict funisitis was of 85% and Sp of 81%). Conclusion: The accuracy to predict an adverse outcome related to infection increased when culture and 16s rRNA were evaluated in combination

EFFECT OF INSR/FOXO1 ON THE EXPRESSION OF POMC IN THE BRAIN OF THE OFFSPRING OF INTRAHEPATIC CHOLESTASIS OF PREGNANCY RATS.

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To study the effect of InsR/FoxO1 on the expression of POMC in the brain of the offspring of intrahepatic cholestasis of pregnancy rats. **Methods:** 40 clean SD pregnant rats were selected and divided into two groups at random. 20 in every group. Since the 13th day of pregnancy, Control group was injected subcutaneously with refined vegetable oil 2.0ml·kg·d⁻¹, ICP group was injected subcutaneously with the 17- α -ethynylestradio(EE) 1.0mg·kg·d⁻¹. 20 female Offspring in Both ICP group and control group were selected at random and feed to six months.. At the 24 weeks of age ,offspring underwent a glucose tolerance test. All rats were killed at the six months. The mRNA of InsR、 FoxO1 and pomc were examined by real –time PCR and westblot. The expression of pomc in brain also examined by immunohistochemistry at 6 months offspring. **Result:** The glucose values of femalet 0min,15min,30min, 60min, respectively)in ICP group were higher than that of control group offspring at 0min,15min,30min, 60min ($P < 0.05$). The mRNA expression o InsR、 FoxO1 and POMC in ICP group offspringwere different with control offspringat six months, ($P < 0.05$). The positive cells of POMC in ICP group were little than that control group. . **Conclusion:** Bile acid levers is higher in ICP . The bad intrauterine environment may be a major contributor to Insulin resistance and POMC

MATERNAL GLUCOSE MEASURED BY S.C. CONTINUOUS GLUCOSE MONITORING IS ASSOCIATED WITH FETAL US BIOMETRIES, MAINLY WITH FAT MEASUREMENTS IN THE AREA OF SHOULDERS

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Background and aims To study the association of subcutaneous continuous glucose monitoring (CGM) with fetal ultrasound biometries in the 3rd trimester. **Materials and methods** CGM ancillary study of the DALI trial. At 35-37 weeks, fetal ultrasound measurements were performed in 58 overweight or obese pregnant women: usual biometries (BPD, HC, AC, FL), fat and lean mass area in humerus (FMH, LMH), and femur (FMF, LMF), subscapular fat thickness (SFT), abdominal fat thickness (AFT) and liver length (LL). In the same period CGM was performed with an iPro2 device® for 3 days. Independent variables: different CGM summary measures including hourly

average glucose, fasting, preprandial and postprandial glucose, percent values within specific ranges and glucose variability and stability indexes. Dependent variables: ultrasound biometrics. Multiple linear regression analysis was performed using variables with a p 0.10 in the bivariate analysis. **RESULTS:** 3-day CGM glucose was 5.49+0.46 mmol/l and birthweight standard deviation score 0.510+1.07. All ultrasound biometrics displayed significant positive associations with CGM summary measures with the exception of LMH. Explained variance after observed R² were in descending order 0.330 for FMH, 0.205 for SFT, 0.198 for FMF, 0.162 for AC, 0.135 for HC, 0.135 for FL, 0.119 for AFT, 0.099 for LL, 0.091 for LMF, and 0.076 for BPD. Different CGM measures were associated with different biometrics. **CONCLUSIONS** Among overweight and obese women, CGM summary measures at 35-37 weeks are positively associated with fetal ultrasound biometrics, mainly fat measurements in the area of shoulders. No single CGM summary measure can be advised.

MATERNAL BRAIN TUMOUR WITH BRAINSTEM COMPRESSION AT 24 WEEKS GESTATION

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A 38 year-old woman was referred at 24 weeks gestation for suspected left Bell's palsy. This was a singleton pregnancy conceived via in-vitro fertilization. She had good past health apart from endometriosis. She suffered from left blurring of vision, left facial numbness, slurring of speech and occasional choking for one month. Physical findings included partial left third and fifth cranial nerve palsy and tandem gait. MRI brain showed 4cm left petroclival tumour with brainstem compression. She was operated at 25 weeks gestation and intraoperative biopsy showed benign meningioma. The tumour was completely resected. Repeated MRI showed no residual tumour and brainstem well decompressed. The remaining antenatal course was uneventful and she delivered a healthy baby vaginally at 39 weeks gestation. There were only case series describing neurosurgery in pregnant patients. Multidisciplinary approach with good communication played crucial role in the management of pregnant patient with brain tumour and brainstem compression at gestation just reached fetal viability. Early operation was necessary because of brainstem compression. Delivery before operation was not advisable because of extreme prematurity. Concerns included anaesthetic agents, positioning, perioperative medications, haemodynamic stability, intra-operative fetal monitoring. This patient was put in right lateral tilt and her head was turned right on head-holder. Total intravenous anaesthesia was used. Hyperventilation was avoided to preserve uteroplacental circulation. Levetiracetam and dexamethasone were started before operation and continued for a week after. Low dose mannitol 0.6-1.1g/kg was used. Fetal assessment by ultrasound and Doppler was performed before and after operation.

THE DETERMINANTS OF MATERNAL NEAR MISS (MNM) AND POTENTIALLY LIFE-THREATENING CONDITIONS (PLTC) AMONG PATIENTS WITH TYPE 1 DIABETES.

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Background: Maternal near miss (MNM) is defined as a woman who almost died but survived severe complications during pregnancy, delivery or the puerperium. PLTC refers to serious situations that can cause MNM or maternal death. Type 1 diabetes mellitus is known for its severe gestational implications and in-depth study of the MNM or PLTC criteria, most commonly found among these patients, may be helpful in improving care. **Objective:** To analyze which criteria for MNM and PLTC were more prevalent among type 1 diabetic pregnant. **Methods:** Secondary analysis of retrospective data collected from medical records of type 1 diabetic pregnant. **Results:** There were 8 cases of maternal near miss and 51 PLTC from 137 pregnancies. Among MNM cases, two filled "seizure

without control” as definition criteria, one presented “creatinine above 3,5 mg/dl”, one “lactate 5” and four “ketoacids on the urine in patients without conscience”. The most frequent complications were: renal insufficiency (50%) and severe hypertension (37,5%). 25% of MNM cases were admitted to intensive care units and all of them were hospitalized for more than 7 days. Among the patients with PLTC, 97.6% were hospitalized for more than 7 days, 19.5% had blood transfusion. 31.37% had, at least, one complication related to hypertension, including 11 cases of severe preeclampsia and 4 HELLP syndrome. **Conclusion:** In this study, the most frequent MNM criteria was “ketoacids on the urine in patients without conscience” and most frequent PLTC criteria were “hospitalization 7 days” and hypertensive complication.

ASSOCIATION BETWEEN NEURAL INJURY MARKERS AND NEURODEVELOPMENT AT 2 YEARS IN INTRAUTERINE GROWTH RESTRICTION

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Objective To evaluate the relationship between brain injury biomarkers and neurodevelopment at 2 years in intrauterine growth restricted infants (IUGR). **Methods** A study including 31 IUGR fetuses and 25 gestational-age (GA) matched controls. S100 protein (S100b) and Specific Neuronal Enolasa (SNE) were measured in cord blood and maternal serum at the moment of delivery. Neurodevelopment was evaluated at 2 years using the Bayley Scales of Infant and Toddler Development, 3rd Edition (Bayley-III). **Results** GA at delivery was 36,69 in IUGR and 37,48 in controls (p=0.255). There were no differences between IUGR and controls in the incidence of perinatal or neonatal complications. Neurodevelopmental evaluation at 2 years showed no differences between IUGR and controls in any of the tests. We found significant inverse relationship between concentration of SNE in cord blood and fine motor subtest and social-emotional test (p0.05) in controls and in controls and IUGR in both. And also between concentration of S100b in cord blood and language test (p0.05) in controls and between S100b in cord blood and cognitive test, receptive communication subtest and social-emotional test (p0.05) in controls and IUGR in both. In IUGR we only found significant inverse relationship between concentration of S100b in maternal serum and adaptive behavior test (p0.05). **Discussion** SNE and S100b were higher in controls and in IUGR with worst scores in some areas of neurodevelopmental evaluation at 2 years. However, the value of these biomarkers for prognostic neurodevelopmental purposes both in controls and in IUGR deserves further investigation.

PRENATAL STRESS MODIFIES RNA EXPRESSION AND DNA METHYLATION OF PLACENTAL 11 β -HSD2 IN FETAL GROWTH RESTRICTION

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Objective: Placental 11 β -hydroxysteroid dehydrogenase type 2 (11 β -HSD2) operates as a functional barrier to protect the fetus from excessive exposure to maternal cortisol. The objective was to determine the role of maternal stress in sub-optimal fetal growth and its relation with RNA expression and DNA methylation of the placental 11 β -HSD2.

Methods: Nested case-control study in full-term singleton gestations. Perceived Stress Scale (PSS) was assessed in mothers of pregnancies with antenatal suspicion of sub-optimal fetal growth that subsequently delivered a small for gestational age (SGA) neonate [birthweight (BW)10th centile; n=35] and in a control group who delivered normally grown neonates (n=26). In addition, RNA expression and DNA methylation of placental 11 β -HSD2 in four CpGs sites were also analyzed. **Results:** Maternal stress (PSS26) was significantly higher in cases than in controls [34.3% (12/35) vs. 7.7% (2/26); p=0.006]. PSS had a significant negative correlation with neonatal BW percentile (r=-0.26; p=0.04). Furthermore, placental 11 β -HSD2 RNA expression (α)^(Ln) was significantly lower in cases than in controls [0.41 (0.29 – 0.87) vs. 1.1 (0.62 – 1.75); p=0.003]. No differences were found in the percentage of placental 11 β -HSD2 methylation between cases and controls. However, when groups were subdivided according to the presence of maternal stress, SGA cases with maternal stress (n=12) have a significantly different (%) of methylation in the median CpGs compared to controls [8.3 (7.6 - 10.3) vs. 11.4 (10.2 - 13.1); p=0.02]. **Conclusion:** Our findings indicate a significant association between pregnant women's stress on suboptimal fetal growth, affecting RNA expression and DNA methylation of glucocorticoids-related placenta genes.