The immune system maintains homeostasis of human body. This ability of the immune system occurs in allo- and autoimmune pathological pregnancy. During pregnancy mother’s body constantly contacts with cells carrying genetically foreign allogenic antigens. During physiological pregnancy mother’s body shows immune tolerability to the fetus but in some cases fetal antigens in mother’s body may cause immune conflict, which mostly appears as anti-Rhesus sensibilisation and is developed in antigen noncompatibility of ABO, Kell and Kidd blood groups, which can cause hemolytic anemia in newborns.

On the other hand mother’s body is also sensibilised by HLA antigens (fetus), which may cause disturbances in fetal development and is not considered as immune conflict. Anti HLA antibodies against fetus does not cause any danger to fetus if placenta appears to be normal, but if placenta is damaged anti HLA can pass placental barrier, damage all cells with HLA antigens which itself will cause development of fetal abnormalities. Activity of HLA antigens has ambiguous character and their production and interaction is not always associated with pathological pregnancy.

The first scientific work about association HLA with diseases was published in 1967. Measurement of HLA markers help to determine the risk groups of the population to various diseases. In case of the population study in line with determination of the immune-genetic profile, a comparison of sick and healthy individuals with differed frequencies was conducted. Nowadays it is accepted that HLA I and II class classic molecules are not placed on trophoblasts; therefore anti-HLA antigens does not cause citotoxic effect on fetus, but trophoblasts are “non classic” HLA-G loci molecules which inhibits natural killer (NK) cells. (Placental tissue contains big quantity of NK cells). NK cells play big role in placental abruption.

It is assumed that infertility in married couples is developed because of 1. Secondary immunodeficiency in woman; 2. antispermal immune conflict; and 3. Increased level of histocompatibility in spouses.

We have studied 23 couples with spontaneous abortions (2-3 abortion). Have been performed Blood tests: on blood group, on Rh, on rare Blood groups –MN, Kidd, Kell, on Rh antigens (C, c, E, e) in Spouses . Also was performed HLA phenotyping A, B, C, and DR. In addition, were analyzed anti-erythrocyte, anti- leukocyte anti-HLA, immune anti-A, anti-B, and antispermal antibodies in women’s serum.

Couples

![Genetic Diagram]

HLA A, B, C, DR Loci

Antigens

ABO

Minor antigens

C, c, E, e, K, M N Jk\(^a\), Ik\(^b\)

HLA typing

anti-RBC

anti-HLA

antisperm antibodies
The couples histocompatibility with I and II class HLA antigens is marked as JH and is assessed in %. e.g. if 1 HLA antigen is common in spouses then they have 25% of histocompatibility, in case of 2 common HLA antigens there is 50% of immunocompatibility. The fertile couples have complete histocompatibility (IH=0%) if couple has 2 antigens and 1 cross acting antigen then IH >50.

Research on HLA antigen in pathological pregnancy is conducted since 1970. There are many works about importance of unwanted influence of HLA homozygosis in human body. Donner H and at all showed that HLA homozygosis appears in different pathologies. St. Sanger suggested that HLA homozygosis is associated with decrease of immune response after vaccination.

It is widely recognized that men with HLA homozygosis have not revealed substances that cause development of fetus defects. By Cristensen’s opinion elevation of DRB1*04 in Danish women cause miscarriages. Furthermore, Bodirev discovered that miscarriages are associated with increase of DRB1*04 and decrease of 07 genotype, too. However, homozygosis in men with genes DRB1*02 and DRB1*07 do not affect reproductive activity; consequently, while studying diseases and HLA problems we learned that, distribution of HLA antigens in different population may be very notable.

HLA typing might be diagnostic for disease prognosis and gives opportunity to take prophylactic therapeutic measures as early as possible.

The goal of our study was to get information about HLA antigens distribution in immunocompatibility of married couples comparing with control group (healthy couples). We studied in Georgian couples (23 couples) distribution of class I and II antigens in immune noncompatible males and females, who had antisperm, antienhedral and antidermatial antibodies. Studied women had no blood transfusion history and history of sensibilization by RBC antigens. Blood samples from couples were analysed with standard lymphocytotoxicity technique (Teresakty) for A,B,C,DR typing. During HLA typing of couples we counted HLA hystocompatibility index. Control group consist of healthy couples.

Our study showed that from the couples we have studied, 87% had elevated HLA hystocompatibility index >50 (N< 50). This appeared in 20 couples from 23. Moreover, from studied 7 women of them had anti HLA antibodies, 8 of them antispermal antibodies and the rest antienhedral antibodies. The investigation proved that HLA homozygosis in main group was 3 times higher than in control group.

Additionally, we discovered the increase of HLA A10, B7, DR2 antigens in studied women; However, we think that small amount of couples have been studied and results are not statistically correct. We will continue studying this problem.

Our study showed that very important value in determination of immune compatibility plays HLA phenotyping of couples. The results of HLA phenotyping allows us to define HLA homozygosis. Moreover, homozygosis of HLA predisposes in increase rate of fertility.