# THE IMMUNE SYSTEMS' CONDITION IS A INDEX OF THE EARLY REACTION ON ECOTOXICANTS' POLLUTION

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**Introduction.**
The increasing number of perinatal disorders indicate upon the environmental pollution and it's harmful effects on a pregnant women which is shown to be the most sensitive for that. We have studied the peculiarity of pregnancy, delivery and immune status in 146 pregnant woman with mature pregnancy (group I) living in large industrial city (Ufa is a capital of Bashkortostan Republic, a city with well developed chemical industry and net of main line). Environment is polluted with different agents, especially with dioxins influencing on the health of population. Immune system responds to xenobiotics first. Fifty one women living in rural areas without high concentrations of pollutants (dioxins, phenols) in their environment were taken as controls.

**Methods and Materials.**
Test of the 1st and the 2nd levels have been used for studying the immune status. We have measured the absolute and relative numbers of lymphocytes, T- and B- lymphocytes. Functional activity of neutrophiles was evaluated by phagocytosis level, phagocytic number and NST-test. Identification of populations and subpopulations of lymphocytes has been made. For humoral immunity study we have measures the CIC levels and content of Ig G, Ig A and Ig M in blood serum.
Cyto- and morphological studies of placenta have been performed. All standard clinical methods of examination of pregnant woman and newborn have been used.

**Results and Discussion.**
Mean age of pregnant woman, obstetrical and somatical anamnesis did not differ in two groups.
The frequency of complications of the second half of pregnancy in tested group (32,8 ± 3,8%) was higher than in controls (14,4 ± 4,9%; $p < 0,05$). The risk of premature delivery in tested group (23,97 ± 3,5%) was significantly higher in comparison with controls (7,84 ± 3,7%; $p < 0,05$).
The states of a fetuses calculated using Fischer's score in the main group were worse than in controls (6,6 ± 0,1 and 7,27 ± 0,15; $p < 0,001$). That caused a big number of infants from group I born in asfyxia (Fig.1.). Apgar-scale marks on the 1st minute in tested group (6,34 ± 0,1) was significantly lower in comparison with controls (6,74 ± 0,14; $p < 0,05$).
Morphological study showed predominantly destructive type of placenta in 43,1 ± 4,0% woman of the tested group (27,4 ± 6,2% in controls; $p < 0,05$).

We have noted the greater number of in-term babies with the symptoms of "over-maturity" in Ufa. Ultrasound cerebral hypoxy signs were observed 1,4 times more often in the infants from group I than in controls.

The decreased absolute (1,63 ± 0,05·$10^9$ /l) and relative (24,29 ± 0,74%) numbers of lymphocytes (total) were founded in the tested group in comparison with controls (2,08 ± 0,13 ·$10^9$ /l; $p < 0,01$ and 28,02 ± 1,28%; $p < 0,05$ accordingly). The numbers of T- lymphocytes in the main group were also lower than in controls.
The tests of the activity of phagocytosis was lower in the tested group(46,3 ± 1,1) than in controls (56,6 ± 5,0; $p < 0,05$). The phagocytic numbers in both groups had not reliable distinctions (5,7 ± 0,22 and 6,32 ± 0,37; $p > 0,05$).
We have found the decreased levels Ig G and increased levels Ig A and Ig M in the umbilical blood in infants (Fig.1.).

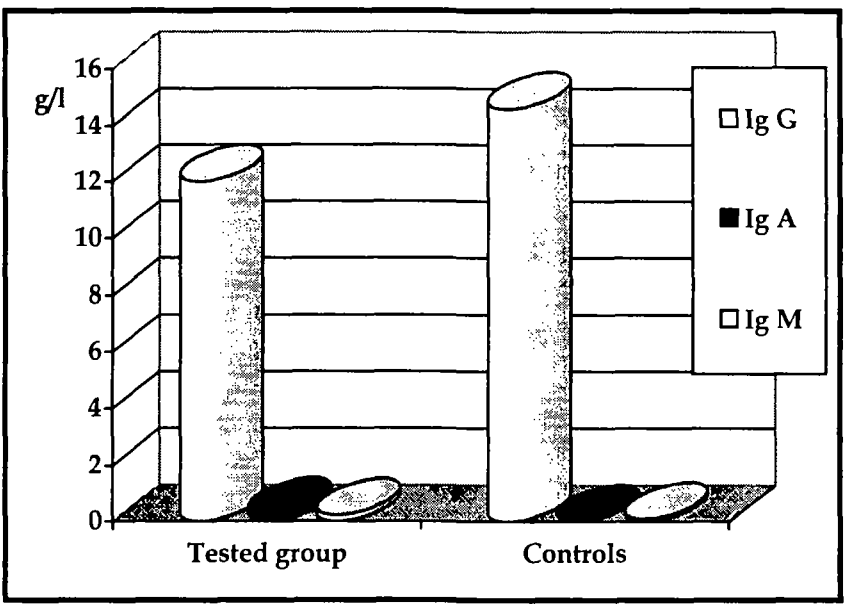


**Fig. 1. Concentrations of immunoglobulins in the umbilical blood serum**

Concentrations of Ig G in blood serum of pregnant women in tested group (11,5 ± 0,4 g/l) were significantly lower than in controls (13,4 ± 0,74 g/l; $p < 0,05$). Ig G concentration were low both in blood serum in women and in the umbilical blood in infants. This may be caused by the defected transport from mother to her fetus due to placenta destruction and/or by autoimmune complications with forming a bigger number of circulation immune complexes (CIC) of G-class in blood serum of women (Fig. 2.).

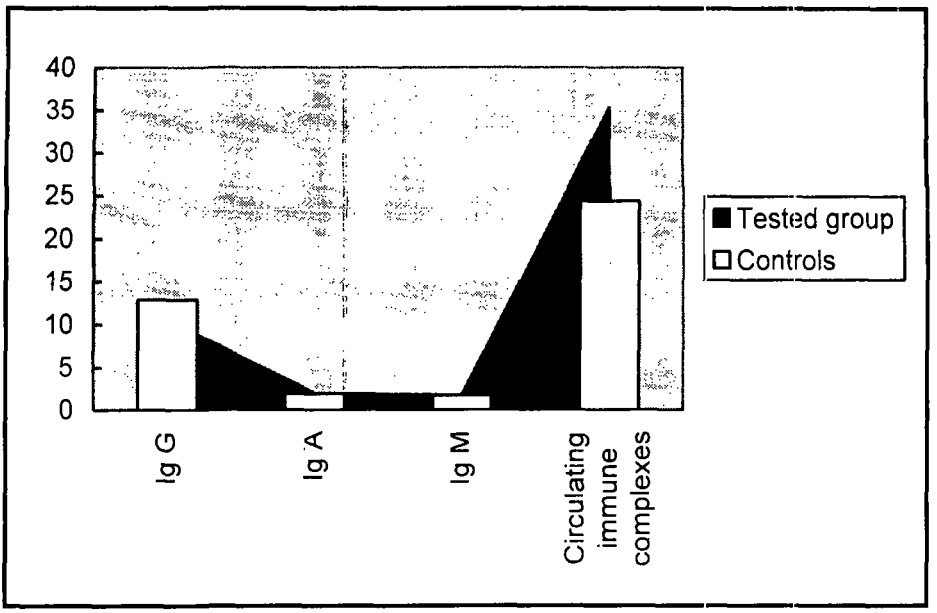


**Fig. 2. Concentrations Ig G, Ig A, Ig M and CIC in blood serum of pregnant woman.**

**Acknowledgments.**
We have found the correlation between the clinical and immunological characteristics of infants and morpho-functional condition of feto-placental system and the most significant changes in the immunity children and their mothers with destructive type of placenta – the Ig G levels were decreased both in mothers and infants (positive correlation r = 0,7) along with the increasing og CIC.
Thus our investigations showed that the industrial ecotoxicants cause significant changes in the immune system of pregnant women living in Ufa: disbalance in cellular and humoral immunity. It is increasing the total morbidity of women, rate of complicated pregnancies and deliveries, decreasing the functional abilities of placenta and worsening the prognoses for newborns.

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