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Michalská 2, Bratislava, Slovakia, 81121

E-mail: [info@original-medicine.eu](mailto:info@original-medicine.eu)

## **INDICATORS OF FREE RADICAL PROCESSES IN WOMEN WITH AMNION PATHOLOGY**

D.A. Ayupova  
Tashkent Medical Academy

**Summary:** The article presents data from studies of protein degradation and free radical processes in women with amnion pathology .

**Keywords:** mother-placenta-fetus system , amnion pathology , SOD, CAT.

It is known that polyhydramnios is a polyetiological condition characterized by an excess amount of amniotic fluid in the amniotic cavity, exceeding 1.5 L [1]. With this pathology, the biochemical, immunological and hormonal parameters of the mother are disrupted, which significantly affects the condition of the fetus and newborn. One of the manifestations of the toxic effect is the intensification of lipid peroxidation (LPO), which leads to the accumulation of toxic metabolites in the body of pregnant women. These issues have been studied in the literature, but there are no comprehensive studies in the mother-placenta-fetus system. All of the above determined the purpose of this study.

### **Materials and methods of research .**

The studies were conducted on 12 pregnant women with a physiological course and 23 pregnant women with moderate polyhydramnios; the age of the subjects ranged from 18 to 36 years on average. There were 6 primiparas with a physiological course of pregnancy, and 8 pregnant women with polyhydramnios. There were 6 multiparous women with physiological pregnancy and 15 pregnant women with polyhydramnios.

To study some biochemical parameters of metabolism in the body of pregnant women during childbirth, the following biological material was examined: maternal blood, fetal umbilical cord blood, placenta (maternal part) and amniotic fluid. In bioassays , the content of malonaldehyde (MDA) [2], the activity of superoxide dismutase (SOD) [3], catalase (CAT) [4], as well as the protein content by the biuret

method and the level of medium molecular peptide (MMP) [5] were determined. The digital material was processed using the variation statistics method.

The causes of polyhydramnios were determined by various types of TORCH infections. In the main group, 20 patients received pathogenetic treatment during pregnancy and in 3 women polyhydramnios was diagnosed upon admission during labor. The diagnosis of polyhydramnios was made based on clinical examination, functional testing (ultrasound), and fetal condition. Thus, 15 pregnant women were diagnosed with moderate polyhydramnios with pronounced signs of placental aging. In 5 women, along with signs of moderate polyhydramnios, dilatation of the ventricles of the brain in the intrauterine fetus was revealed. Among the women of the main group, 19 women gave birth at term, 4 had premature birth, 5 patients were delivered by cesarean section due to the addition of obstetric pathology. Weakness of labor occurred in 6 observed women of the main group. The postpartum period was complicated by a placenta defect in 3 cases; 4 women had uterine hypotension, which was relieved by the administration of uterotonics .

### **Research results and discussion.**

Analysis of biochemical parameters of the mother's blood showed a statistically significant increase in MDA content by 77.2% ( $p < 0.05$ ) against the background of inhibition of antioxidant defense enzymes (AOD), and while SOD activity significantly decreased by 38.6%, then catalase activity only by 30.1%. The same changes were characteristic of the umbilical cord blood of a newborn. Thus, the MDA content increased by 120.3%, which is significantly higher than those of the mother. The activities of SOD and CAT enzymes were inhibited by 37.3% and 24.1%.

The condition of newborn children in the vast majority of cases was characterized by signs of intrauterine infection - intrauterine pneumonia in 4 children, pyoderma in 5, moderate and mild hydrocephalus in 2.

The data obtained indicate pronounced disturbances of chemical homeostasis not only in pregnant women suffering from polyhydramnios, but also, especially in

the fetus, which is the cause of the development of various postpartum complications (pneumonia, amphotillitis, sepsis, etc. ) .

It is known that the placenta not only acts as a link between mother and fetus, but also acts as a barrier to foreign compounds. At the same time, in many pathological conditions in the body of pregnant women, under the influence of chemical, physical, and mechanical factors, there is a weakening of its protective functions, which contributes to an increased supply of endotoxins from the body of pregnant women to the fetus.

Considering the above, we also studied LPO and AOD of the placenta. The study showed a sharp - more than 2-fold - increase in the level of MDA in relation to those indicators during the physiological course of pregnancy. This indicates a sharp increase in the permeability of placental biomembranes due to activation of phospholipases and LPO. This is also facilitated by a pronounced decrease (by 56.3%) in the activity of SOD and by 47.9% of catalase.

Pathological changes in placental tissue, due to the above-mentioned biochemical abnormalities, are confirmed by ultrasound, which indicate edema, the presence of petrification and early aging, which, in turn , leads to corresponding changes in the fetus.

According to the literature, amniotic fluid performs a transport function. Its composition depends on the metabolism of the fetus and placental products. The above factors lead to a disruption of its biochemical composition and the accumulation of toxic metabolites in it. To clarify this issue, we also examined amniotic fluid during childbirth. It has been found that in pregnant women with polyhydramnios, it becomes more cloudy with the presence of flakes. Moreover, we identified an increase in protein content, the level of SMP (123.7% and 85.4% at 323 and 274 nm), as well as an intensification of LPO (by 52.3%), therefore, there is a change in the composition of the amniotic fluid, manifested by the accumulation toxic metabolites such as MDA and, especially, molecules of medium weight. On the one hand, this is apparently due to the release of these products by the fetus, due to

their accumulation in its body, as well as their entry through the placenta. Based on the data obtained, the following conclusions can be drawn:

1. Both in the mother and in the umbilical cord blood of the fetus, intensification of LPO is observed against the background of a weakening of AOD, and the intensification of LPO processes is more pronounced.

2. In pregnant women with polyhydramnios, there is an accumulation of MDA in the placenta and a decrease in the activity of SOD and catalase, which is confirmed by placentometry data .

3. The amniotic fluid of pregnant women with polyhydramnios contains large amounts of protein, medium-weight molecules and malondialdehyde. These changes coincide with increased turbidity and odor.

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