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Research Article

Metabolic Correction of Endogenous Intoxication in Integrated Therapy of Pregnant Women with ABO-Immunization

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Abstract

The expressiveness of changes of indexes of a proteolysis depends on complications of a current of the period of a gestation, a condition of a fetus. Prophylaxis of complications at pregnant women with ABO- immunization requires performing corrective treatment with inclusion of the medicines improving a condition of a fetoplacental complex and reducing an endotoxemia. To this end, we studied the action of the metabolic drug Cocarnit.

Keywords: Endogenous; Therapy; Pregnant

Relevance

Against the backdrop of developing ABO-immunological conflict in intrauterine development of hemolytic disease of the fetus, an important mechanism is the violation of uterine and fetoplacental blood circulation [11]. Associated with this, dismetabolic disorders lead to microcirculatory disorders, ischemia and hypoxia, cellular metabolism, which in turn have a negative impact on both local and general blood circulation in the mother-placenta-fetus system. At the same time, trophic and respiratory insufficiency develops, the accumulation of toxic products of impaired metabolism in the mother-placenta-fetus system, disruption of the transport of oxygen and carbon dioxide [10]. Therefore, the fight against oxygen deficiency and endotoxemia in the developing ABO-immunological conflict, especially in the II and III trimesters of gestation, when irreversible changes in tissues have not yet developed, is an important part of complex therapy [11]. In recent years, for these purposes, drugs that specifically affect the energy potential of cells are widely used. Most clinicians give preference to medicines that reduce the energy needs of the tissues, thereby increasing their resistance to hypoxia. These drugs include antihypoxant-carriers of electrons, which is represented by (Pharmaceutical Company "World medicine" of the Austro-American production). Therapy with Cocarnit has a pronounced therapeutic effect on the condition of the fetus developing in conditions of placental insufficiency, which is reflected in a significant improvement in blood flow in the fetal placental vessels and the dynamics of its intrauterine growth [10]. Cocarnit contains adenosine triphosphate (10 mg), cocarboxylase (50 mg), cyanobolamine (500 μg) and nicotinamide (20 mg), which allows you to have a positive effect on impaired metabolic processes in body tissues.

In recent years, the processes of sensitization of education-related toxic products (protein toxins - medium mass molecules) of impaired metabolism, which as antigens can play a key role in regulating receptor activity. The greatest danger is represented by toxins simulating the processes of signaling the initiation and regulation of cell growth, differentiation, metabolism, development of neurohumoral systems, interaction of cells of the immune system and cell transformation [5]. Such signal modulators of receptor systems include oligopeptides (OP), formed during proteolysis of proteins, which contain tyrosine and tryptophan-containing peptides (TZP and TRP). The influence of Cocarnit on the level of OP, the role of TZP and TRP in the pathogenesis of ABO-sensitization in pregnant women is practically unexplored, which determines the relevance of the problem, the scientific novelty of the study.

Goal

To assess the level of endogenous intoxication in the blood serum of pregnant women with ABO immunization when assigned to the complex therapy of the drug Cocarnit.

Materials and Methods of Research

The survey included 90 pregnant women with ABO-immunization, the average age was 19.3 ± 5.8 years. Pregnant women were randomly divided into groups. The 1st - comparison group consisted of 30 pregnant women with the I (O) Rh (+) blood group with the presence of antibodies treated with the traditional method.

In the 2nd – Basic group 30 pregnant women with I (O) Rh (+) blood group with the presence of antibodies, which included Cocarnit in a dose of 1.0 ml intramuscularly, with a course of 6-10 days. Control for both study groups were 30 pregnant women with I (O) Rh (+) blood group without antibodies. The level of antibodies was determined by enzyme immunoassay on the Human instrument Austria, and also with the Coombs probe. At the same time, the blood group and Rh factor were determined. In the blood serum before treatment and on the 6th and 10th day of treatment, TZP, TRP and non-peptide components (NPK) were determined by the method of VB Gavrilov., *et al.* [4], as well as the concentration of cytochrome C by the method of NA Guatua., *et al.* [2,6]. The obtained data were processed statistically using the "Statistica for Windows" software package. To assess the reliability of the data obtained, the Student-T parametric criterion was used. The data was considered reliable for $P < 0.05$.

Results and Discussion

Prior to treatment in both compared groups of pregnant women with ABO immunization and the presence of antibodies, a significant increase in OP produced during proteolysis of proteins was observed in serum, non-peptide substances with low and average molecular weight of non-peptide components, accumulating in concentrations that are toxic to the body. Increases in OP, occurs due to a significant increase in the concentrations of TZP and TRP. Simultaneously, in the serum of pregnant women with ABO immunization significant increase in cytochrome C, which on average exceeds the data in the control by 28.3 ($P < 0.001$) %. After the therapy in both groups of pregnant women with ABO immunization there is a positive dynamic directed to decrease in blood toxic compounds of TZP, TRP, general OP, non-peptide components, and also cytochrome C.

However, the revealed positive changes of the indicators characterizing a degree endotoxemia and pro-apoptotic processes in fabrics were essentially higher in the second group of pregnant women, than in the first. After the 6th and 10th days of treatment, the TZP index in the 2nd group was lower than in the pregnant group 1 by 18.5 and 17.3% ($P < 0.05$), TRP by 18.0 ($P < 0.05$), the amount of OP is 15.8 and 17.1% ($P < 0.05$), and cytochrome C is at 14.6 and 15.0% ($P < 0.05$).

It can be assumed that a more pronounced decrease in the toxic products of the exchange of TZP, TRP, non-peptide components, OP in the 2nd group of pregnant women with ABO immunization than in the pregnant group 1 was due to the positive action of Cocarnitis on the metabolic processes in the tissues. This is evidenced by the recovery data, at the end of the 10th day of treatment, to the control values of the content of cytochrome C in the blood serum in pregnant women with ABO immunization group 1, this indicator still significantly exceeds the data in the control - by 21.0% ($P < 0, 01$).

To confirm the importance of tissue respiration disorders in the body of pregnant women with ABO immunization, we performed a correlation analysis of the relationship between the cytochrome C index and endotoxemia parameters. At the same time, a clear, positive correlation dependence before treatment between a high content of cytochrome C and parameters of TZP, TRP, non-peptide components and OP was revealed and amounted to $r = 0.78$; 0.73; 0.71 and 0.85 ($P < 0.01$). After the treatment on the 10th day of therapy in the 1st group, the correlation between the indices of cytochrome C and endotoxemia parameters was preserved ($r = 0.56$, 0.51, 0. %, 0.64), whereas in the 2nd group it was not strong ($r =$ 0.11, 0.08, 0.05 and 0.14 $P > 0.1$).

According to G. G. Antashyan [1], V. V. Vetrova [3] and M. Ya. Malakhov [8], the syndrome of endogenous intoxication violates the hemocoagulation system, microcirculation, hypoxia develops, metabolic processes are disturbed, which leads to the development destructive changes in the placenta. This indicates the need to study the biochemical parameters of endogenous intoxication in pregnant women with ABO immunization to obtain sufficient information about the state of the fetoplacental complex. Single studies have been devoted to the study of endogenous intoxication during isosensitization in pregnant women [10]. However, when ABO immunization such studies have not been conducted.

Consequently, a clear relationship between the degree of increase in proteolysis of proteins and pro-apoptotic phenomena in the tissues of pregnant women with ABO immunization was revealed. With traditional treatment, a high level of endogenous intoxication is maintained by disturbed processes of tissue respiration. This, undoubtedly, leads to a decrease in the body tissues of pregnant women with ABO immunization of toxic metabolic products. In this regard, it can be assumed that a high level of cy-

tochrome C in the blood serum of pregnant women with ABO immunization before treatment is associated with the processes of excessive amounts of toxic metabolic products. With traditional therapy, high concentrations of toxic metabolic products are retained, which naturally does not significantly affect the decrease in serum content of cytochrome C. At the same time, the purpose of the multicomponent Cocarnit preparation promoted the improvement of tissue respiration in tissues and, as a consequence, a positive effect on the processes of reducing toxic products metabolism and cytochrome C in the serum of pregnant women with ABO immunization.

Thus, the conducted studies showed that traditional treatment is an inadequate method of therapy aimed at reducing the high level of toxic metabolic products and cytochrome C in the blood serum of pregnant women with ABO immunization. A statistically significant decrease in toxic products of the exchange of TZP, TRP, non-peptide components and Opia proapoptical factor - cytochrome C in the blood serum when Cocarnit is prescribed for complex treatment to pregnant women with ABO- immunization is pathogenetically justified. Decrease in serum TZP, TRP, NPK, OP, cytochrome C under the effect of treatment testifies to their importance in the pathogenesis of ABO immunization in pregnant women with I (O) Rh (+) immunization, which is important to take into account in the monitoring of differential diagnosis of this disease [12,13].

Conclusions

1. In pregnant women with ABO-conflict, a high level of endogenous intoxication is caused by an increased content of the sum of oligopeptides (OP), tyrosine and tryptophan-containing peptides (TRP and TRP), non-peptide components (NPK), and paracortical factor-cytochrome C in the serum.
2. Cocarnit in complex therapy increases the effectiveness of traditional treatment aimed at reducing the body's pregnant processes of endotoxemia and apoptosis.
3. Cocarnit helps reduce the process of endotoxemia in the body of pregnant women with ABO immunization through the mechanism of recovery of utilization of the respiratory enzyme - cytochrome C.
4. A clear correlation was found between the high content of TZP, TRP, NPK, OP and elevated levels of cytochrome C, which indicates the interdependence of these processes in the realization of hemolytic disease of the fetus in pregnant women with ABO immunization.

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