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INFLUENCE OF INFLAMMATORY MARKERS ON THE DEVELOPMENT OF COMPLICATIONS IN PREECLAMPSIA

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Abstract: Normally, the amount of CRP in blood serum is from 0 to 10 mg/l. Inflammation or acute detection of an increase in the concentration of CRP before tissue coverage. The aim of the study was to determine the role of C-reactive protein (CRP) inflammatory markers in the development of obstetric and perinatal complications in preeclampsia (PE). The experiment involved 85 pregnant women. Of these, 31 pregnant women with severe PE and 29 with mild PE. The control group consisted of 25 healthy pregnant women without hypertension.

Keywords: C-reactive protein, preeclampsia, early childbirth.

C-reactive protein (CRP) is a marker of the acute phase of inflammation and plays a protective role in innate immune responses. CRP is a pentamer weighing between 1,100,000 and 1,400,000 g, composed of five subunits of 215,000 g each according to the type of radial symmetry, and has the electrophoretic mobility of beta-gamma-globulins [2].

One of the functions of CRP is to neutralize by binding damaged and harmful products - components of cell debris (phosphorylcholine, liposomes, phosphate monoesters, polysaccharides), nucleoproteins, bacterial toxins, modified lipoproteins. CRP causes the elimination of toxins from the body. It is known that CRP promotes the activation of natural killers, T-lymphocytes and polymorphonuclear neutrophils through special receptors on their cell membranes, and participates in the swelling of the bactericidal capsule, phagocytosis and complement fixation reactions. The structural gene of this protein is located on chromosome 1 and is synthesized in the liver. [8].

When interacting with antimicrobial and antitumor immunological mechanisms, CRP activates macrophages, neutrophils and C1-C4 complement components, which leads to activation of kallikrein and fibrinolytic systems of hemostasis, release of activators of coagulation and anticoagulation systems[5]. At the same time, CRP inhibits platelet aggregation and stabilizes the membrane, thereby demonstrating its anticoagulant function.

Normally, the amount of CRP in blood serum is 0 to 10 mg/l. Inflammation or acute tissue damage causes an increase in CRP concentration up to a thousand times [1,6]. Thus, an increase in the level of CRP from 20 to 53 ± 6 mg / l is observed in premature dissolution of the placenta and chorioamnionitis.

Although CRP is considered a good marker of acute inflammation, Smith E.J. and co-authors [4], based on a statistical meta-analysis, show that CRP is a prognostic marker of chorioamnionitis, preeclampsia, and systemic inflammation.

The amount of CRP in pregnant women does not exceed 20 mg/l Farzadnia M. and according to others, an increase in the amount of CRP in blood serum during childbirth was noted in 16.6% of cases. The concentration of CRP in the blood serum of pregnant women complicated by late toxicosis is 3-10 times higher than that of the control group of normally developing pregnant women, 70-220 and 20 mg/l, respectively [9]. More sensitive methods, as well as CRP levels above 7 mg/l, were significantly more frequent in pregnant women with preeclampsia compared to normal pregnancies, 73.9 and 6.2%, respectively. [10].

Preeclampsia is one of the most common complications after the 20th week of pregnancy and is characterized by high blood pressure and proteinuria. It accounts for 2-8% of obstetric pathology worldwide and causes high rates of maternal mortality [9] as well as maternal and neonatal morbidity. The cause of preeclampsia is unknown, and inflammation plays an important role in its pathogenesis.

Clinical and biochemical evidence shows that endothelial dysfunction is the main cause of this condition [3] and it is accompanied by increased inflammatory markers, CRP oxyl may work as predictors of preeclampsia. Changes in the maternal immune system occur during preeclampsia, and CRP as an important component of the innate immune system may play a role in aggravating preeclampsia [7].

The study of the mechanisms of preeclampsia led to the development of a "systemic inflammatory response". CRP is characterized by the activation of phagocytes, endothelial cells and platelets. As a result, the production of free radicals, cytokines, and arachidonic acid derivatives increases, which helps generalize the pathological process [1, 3]. Symptoms of the latter include changes in the hemostasis system (primary damage to the platelet joint), immune status, slowing of the increase in circulating plasma volume, etc.

In addition to various inflammatory responses, hypothyroidism, hypercholesterolemia, and oxidative stress are also potential markers of preeclampsia [8]. Thus, in pregnant women with preeclampsia, CRP, total cholesterol, triglycerides, and low-density lipoproteins are significantly higher in blood serum compared to normal pregnancies.

Bullen B.L., et al found that CRP levels (5.5 ?g/ml) were significantly higher in preterm births than term births (4.8 ?g/ml), especially in chorioamnionitis (6.3 ?g/ml). They also found a direct correlation between an increase in CRP up to 8.9 ?g/ml and preterm birth in women with a high body mass index compared to low-weight pregnant women. According to other data, an increased level of CRP is also associated with the possibility of preterm birth. Premature birth is directly related to the amount of CRP in the amniotic fluid. An increase in the level of CRP can serve as a sign of the risk of premature birth. Based on a statistical meta-analysis of 23 publications (727 women with preeclampsia and 3538 control women), Rebelo F. et al concluded that a CRP concentration greater than 2.30 mg/L (normal range 1.27-3.34) increases the risk of eclampsia in pregnant women with large birth weights.

Purpose: to determine the role of inflammatory markers C reactive protein in the development of obstetric and perinatal complications in preeclampsia.

Research materials and methods. The study was conducted on the basis of the regional perinatal center and the city maternity complex during 2019-2022. Pregnant women with preeclampsia from 28 to 36 weeks were included in the study. Informed consent was obtained from pregnant women to participate in the study.Exclusion criteria: multiple pregnancy, symptomatic arterial hypertension, systemic connective tissue diseases, mental disorders, HIV infection.

85 pregnant women participated in the study.31 of them were pregnant women with severe PE and 29 with mild PE. The control group consisted of 25 normal pregnant women without hypertensive diseases. All pregnant women underwent a single complex of diagnostic studies: general physical examination; blood pressure, clinical blood analysis, 24-hour urinalysis, fetal ultrasound, dopplerometry. The amount of C-reactive protein in the blood was determined from biochemical analyses.

Results. The average age of pregnant women examined in all groups of the study did not differ significantly from each other. The average age in the group with severe preeclampsia was 27.19±0.89, in pregnant women with mild preeclampsia was 29.56±0.92, and in the control group, the average age was 28.35±0.9. (p> 0.05). Also, there was no significant difference between the height indicators of all compared groups, and according to the main anthropometric parameters - the height and weight of pregnant women (p> 0.05), in comparison with the control group, more body weight and different degrees of obesity were observed in pregnant women with preeclampsia. The average amount of CRP in the blood serum of the control group was 5.23+0.204ME/l,

When the serum of women complicated by severe preeclampsia was examined, the average indicator of CRP was 45.12+1.50ME/l, and the average indicator of CRP was 23.00+2.32 in pregnant women with mild preeclampsia, the second group under our control.

The concentration of CRP in blood serum of pregnant women complicated by preeclampsia was 8.6 times higher than in pregnancies not complicated by preeclampsia.

The risk of preterm delivery increased when the amount of CRP in the blood of pregnant women with preeclampsia exceeded 10 ME/L, and preterm delivery was 16.1% in pregnant women with mild preeclampsia, 31% preterm delivery in pregnancies complicated by severe preeclampsia, and up to 3.2% in the control group. premature births were observed. Premature births, in turn, lead to low birth weight babies and worse perinatal outcomes.

Summary. By knowing the amount of CRP in the blood serum of pregnant women with preeclampsia, we can tell women about perinatal and obstetric complications before they occur and carry out their early prevention. In this way, we can prevent obstetric and perinatal complications during pregnancy and childbirth and improve their outcomes. This helps to save on drugs and medical equipment used for the treatment of these complications and shorten hospital days.

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