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Assessment of the Biochemical Status of Women in Labor with Preeclampsia

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Abstract: This review presents the results of scientific work on the study of the immuno-biochemical status of women in labor with preeclampsia. Indicators of developing problems in the body of a pregnant woman are changes in the biochemical composition of the blood, which make it possible to predict maladaptation syndrome in newborns.

Keywords: preeclampsia, immuno-biochemical changes, newborns.

Introduction

Relevance. One of the important and significant problems in modern obstetrics is the problem of preeclampsia. The frequency of preeclampsia in the general population of pregnant women is 5-10% and is one of the main causes of maternal mortality - 12-30%. According to modern concepts, preeclampsia is considered as a "disease of adaptation" to pregnancy with all stages inherent in the general adaptation syndrome. Preeclampsia is one of the most pressing problems of obstetrics, as it causes maternal and perinatal morbidity and mortality. According to a number of researchers, endothelial dysfunction is the basis of the initiating mechanisms of hypertension, rheological disorders and hemostatic potential of blood in preeclampsia. Endothelial dysfunction in the mother with preeclampsia leads to the development of fetoplacental insufficiency, chronic intrauterine fetal hypoxia, and chronic intrauterine fetal hypoxia can serve as one of the key factors of perinatal lesions of the nervous system of the newborn[2,5].

In this regard, it is important to study the severity of endothelial dysfunction in the mother-placenta-fetus system in

preeclampsia of varying severity. Preeclampsia is dangerous in the postpartum period, it is equally dangerous for the life of mother and child. With preeclampsia, the functions of vital organs are disrupted: kidneys, brain, liver, lungs, which often leads to the development of multiple organ failure. The consequences of preeclampsia are manifested not only in the early postpartum period, but also in the subsequent years of a woman's life, and this primarily concerns brain functions [3].

To predict long-term postpartum complications in women who have undergone preeclampsia, the indicators of central and cerebral hemodynamics obtained using the method of integral body rheography and rheoencephalographic examination of cerebral blood flow are used. Maternal and perinatal morbidity and mortality rates are affected by the method of delivery in preeclampsia. According to the literature, cesarean section is 70% or more in premature pregnancy, because many obstetricians and gynecologists prefer to perform cesarean section in these patients, even if the fetal condition allows delivery through the natural birth canal [4,6].

Observational studies show that childbirth through the natural birth canal may be better in the long term for premature babies, also offer maternal benefits with fewer complications, shorter hospital stays with a lower complication rate and a shorter hospitalization period. In addition, the frequency of cerebral palsy in newborns remains the same.

The aim of the study: To study the immuno-biochemical status of women in labor with preeclampsia in order to predict and prevent neonatal maladaptation in newborns

Objectives of the study: to analyze biochemical changes, blood lipid spectrum and markers of inflammation in women in labor with preeclampsia and gestational hypertension

Table 1.

Blood parameters of pregnant women with PE, (M ±m)

Indicators	1group	2 group
	Control group n=30	PE n=45
Glucose (g/l)	5,08±0,1	4,5± 0,10*
Total protein, mg/l	62,0±1,0	48,0 ±1,5*
urea	2,9±0,1	5,66± 0,11***
creatinine	13,2±1,8	54,23± 1,0***
SCHF units/l	102,9±0,1	103,4± 2,58
LGD unit/l	304,8±8,27	438,0±8,60**

Note: * The values are valid in relation to the control group (P<0,05 - 0,001)

In contrast to the blood parameters in GH, in pregnant women with PE, the concentration of alkaline phosphatase was at the level of control values. LGD, known as an indicator of tissue destruction, was

Table 2.

Parameters of the lipid spectrum at PE (M ±m)

Indicators	Control group n=30	PE n=45
Total cholesterol (mmol/l)	5,31±0,13	6,40±0,18*
HDL (mmol/L)	1,55±0,98	1,31±0,09*
LDL (mmol/L)	0,98±1,33	2,24±0,09*
TG (mmol/L)	1,45±0,04	2,04± 0,09
Atherogenicity index	2,12±0,05	3,88±0,10*

significantly increased in PE, which indicates a high risk of developing multiple organ changes in this case. Indicators of the blood lipid spectrum in PE also indicate the development of hypercholesterolemia against the background of increased LDL and increased IA

Note: * The values are valid in relation to the control group (*P<0,05 -** 0,001)

This means that with PE in pregnant women, the risk of developing CVD and atherosclerosis increases. The revealed condition can be explained by a peculiar mechanism of development of GH and PE, the latter usually develops against the background of hypertension and MS preceding pregnancy. Endothelin (ET-1) is one of the most significant regulators of the functional state of the vascular endothelium. It is the most powerful vasoconstrictor and marker of endothelial dysfunction. The endothelium plays an important role in the regulation of vascular tone. ET-1 has both inflammatory and proliferative effects and leads to pathogenic processes in the cardiovascular system [7,8].

Vascular endothelium, according to a number of authors, is an endocrine organ, and performs numerous functions, in particular, regulation of blood coagulation potential, as well as vascular tone. In the pathogenesis of diseases of various etiologies, an important role belongs to endothelial dysfunction, in connection with this, it is absolutely necessary to know the numerous functions of the vascular wall under normal conditions and markers of endothelial dysfunction, indicating the development of pathology [1].

The study of the nature of endothelial dysfunction showed an increase in the level of CRP to 5.5 ± 0.06 mg/l and VEGF to 942.8 ± 3.18 pg/ml, against control values - 1.69 ± 0.09 mg/l and 77.4 ± 1.5 pg/ml, respectively. At the same time, the PKT remains at the control level.

Table 3.
Indicators of markers of inflammation in PE (M±m)

Indicators	Control group n=30	PE n=45
CRP mg/l	$1,69 \pm 0,09$	$5,5 \pm 0,06^{***}$
PCT ng/ml	$0,07 \pm 0,03$	$0,062 \pm 0,1$
VEGF пг/мл	$77,4 \pm 1,5$	$942,8 \pm 3,18^{***}$

(* - P<0,05, ** - P<0,01, *** - P<0,001)

Conclusion. The results obtained confirm the relationship of the development of PE in pregnant women with the state of lipid and carbohydrate metabolism, concomitant diseases preceding pregnancy. Consequently, the duration and severity of the course of hypertension and MS in women of reproductive age determine the involvement of the myocardium and brain in the process, with the development of PE during pregnancy, and indicate in the future a high risk of cardiogenic and cerebral complications.

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Note: * The values are valid in relation to the control group

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