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Peculiarities of cardiac hemodynamic in pregnant women with mild preeclampsia

Abstract: Study the characteristics of cardiac hemodynamic in pregnant women with mild preeclampsia. Inadequate marker of cardiovascular adjustment in PE is to develop disproportionately LVM, the formation of isolated diastolic left ventricular dysfunction and the development of circulatory system in all organs and tissues. Thus, a disproportionately high rate of LVM, in patients with mild preeclampsia is as a predictor of severe preeclampsia before its clinical manifestation, and the indication for revision of the tactics of pregnancy.

Keywords: Doppler, pre-eclampsia, left ventricular, cardiohemodynamics.

The problem of preeclampsia — one of the most urgent in modern obstetrics [1; 2; 4; 8; 9]. Preeclampsia is a progressive disease, forms, manifestations of which may be very different, as well as the pace of growth of its manifestations [4; 5; 6; 7].

Analyzing the numerous studies on preeclampsia (PE) and eclampsia (E), it can be concluded that a very significant role in the pathogenesis of this complication of pregnancy and childbirth plays violations in the circulatory system of mother and fetus. All of the above, and strongly suggests a more in-depth study of the state of different parts of the circulatory system in the dynamics of the development of PE, and E. And, of course the very heart (myocardium) can not participate in the changes taking place throughout the circulatory system [5; 6; 7; 8].

It is still unclear what are the real changes in the parameters in different types of preeclampsia, and whether there is a possibility of restoring LVM after birth, which is extremely important for judging questions about early detection of developing complications from the heart, and the prevention of targeted therapy.

Objective: study the characteristics of cardiac hemodynamic in pregnant women with mild preeclampsia.

Materials and methods

The basis of this paper on the results of a survey of 60 women in the III trimester of pregnancy. I made -group 30beremennye with physiological pregnancy, 30 pregnant women with mild PE (II group). From instrumental methods were applied Doppler echocardiography. The study was conducted at 30–34 weeks of gestation. Echocardiography was performed on the machine. The company Sono Scape models SSI-5000 (China). The method of tissue doppler echocardiography (TMDEhokG) were determined left ventricular myocardial mass.

LVM was calculated in the one mode — the formula Devereux R.B and Riechek N in accordance with the Penn-convention:

$$LVM_i(r) = 1,04 \times [(PW\ d, mm + IVS\ d, mm + EDD, mm)^3 - (EDD, mm^3)] - 13,6$$

The criterion for LVH takes a value and $LVM > 110g/m^2$
Statistical processing of the results was performed using

Student's t test using a software package Statgraf and Microsoft Excel version for Windows.

Results and discussion.

Considering that one of the most important features of a PE hypertension violation organ blood flow, we considered extremely important in the groups studied pregnant women to trace

the dynamics of changes in the circulatory system as a whole, and drawing attention to the indicators of cardiac hemodynamics (CG) starting with the gestational age of 30–34 weeks.

The table below describes the function of the heart in patients of Group II, received us in by Doppler studies where we give a comparison and reference values of these parameters.

Table 1. – Doppler echocardiography volume indices of cardiac function in pregnant women groups I and II in terms of gestation 30–34 weeks. (n = 60)

Indicators	I group n=30	II group n=30	P
EDV, ml.	139,9 ± 1,0	135,6 ± 4,3 (120–146)	> 0,05
ESV, ml.	45,5 ± 3,1	49,1 ± 2,4 (38–59)	> 0,05
EF, %	67,2 ± 4,2	63,7 ± 2,1 (59–68)	> 0,05

Note: In parentheses are the scatter data II study groups of pregnant women.

When analyzing the performance parameters of the pump and myocardial contractility in pregnant group II in the III trimester, compared with those patients in the control group, we did not find the distinctive changes. There have been a downward trend in indicators of EDV and EF, with an increase in ESV.

Indicators EDV, EF, pregnant Group II in the III trimester of pregnancy in terms of 30–34 weeks of 3.1 and 5.3% were

below the reference values, while ESV is 7.9% greater than the number of the control group.

Analyzing the data, one must assume that the accession of PE due to changes in cardiac hemodynamics appropriate change of contractile function in ventricular myocardium. For a more detailed understanding of the changes of cardiac pump function within a specified time of gestation in pregnant women with mild PE indicators we studied the geometry of the heart.

Table 2. – These Doppler echocardiography to assess left ventricular function in pregnant women groups I and II in terms of gestation 30–34 weeks. (n = 60)

Indicators	I group n=30	II group n=30	P
EDD, mm	48,3 ± 2,0	45,2 ± 1,6 (40–51)	> 0,05
ESD, mm	33,4 ± 1,6	33,0 ± 1,9 (29–38)	> 0,05
LA, mm	31,5 ± 1,0	31,7 ± 1,6 (25–35)	> 0,05
RV, mm	24,7 ± 1,1	25,9 ± 2,0 (20–31)	> 0,05
PW d, mm	8,1 ± 0,3	11,0 ± 0,9 (9–13)	< 0,05
IVS d, mm	8,4 ± 0,4	10,4 ± 0,7 (9–12)	< 0,05
DA, mm	28,5 ± 0,7	29,3 ± 0,4 (26–31)	> 0,05
LVM, g	159,9 ± 8,7	204,7 ± 9,0 (144–258)	< 0,05
LVMi, g/m ²	97,9 ± 4,0	111,9 ± 5,3 (85–160)	< 0,05
RWT	0,38 ± 0,04	0,49 ± 0,04 (0,37–0,60)	< 0,05
DC, %	129,0 ± 4,7	141,0 ± 3,8 (97–184)	< 0,05

Note: in brackets shows the percentage of pregnant women scatter group II.

In analyzing the data in the table, it may be noted that the figures and EDD, ESD compared to control values in pregnant Group II have a tendency to decrease (not statistically significant).

As for the size of the wall of the left atrium, right ventricle, aortic diameter, they also do not undergo significant changes, but the thickness of the left ventricular posterior wall and inter ventricular septum accession PE even mild undergoing significant changes. PW d and IVS d were increased respectively by 35.8% and 23,8% (p < 0,05) in both cases. There was also a significant increase in the relative thickness of the wall of the left ventricle to 28,9% (p < 0,05).

Increasing the thickness of the walls of the left ventricle causes an increase in left ventricular mass by 28% and the index of left ventricular mass to 14,3% (p < 0,05) in both cases.

What indicative of developing left ventricular hypertrophy, peripheral work against high pressure. Increase DC 9.3%

indicated the proportional increase of left ventricular myocardium.

At 6 pregnant women (20%) of this group LVMI values were in the range 119–127 g/m² and RWT was within 0,47–0,60 units. That is higher than normal, indicating whether they are concentric hypertrophy, which and led to a decrease in contractile ability of the left ventricle manifested in the decline in the EDV within the 120–131 ml of EF within 59–61%.

Indicators LVMMI and OTC in 13 pregnant women (41.9%) indicated they have a concentric remodeling. LVMMI these patients did not go beyond the norm. RWT ranged 0,51–0,60 units. In 11 pregnant women in this group (35.5%) stated the normal geometry of the left ventricle. Since the rate of pregnant LVMMI was within normal limits, and RWT ranged 0,46–0,49 units. Only in this group of a pregnant transferred from the control group in Group II took place Eccentric type of left ventricular geometry (3.3%).

All pregnant women with type concentric left ventricular geometry during the therapy (basal magnesia, hypertensive, and antispasmodic) were taken by us under monitor observation periods of 30–34 weeks or more. In three of them, in spite of the ongoing corrective therapy, we were awarded us with resistant hypertension deterioration in the pumping function of the left ventricle, reduced ejection fraction. All this required the transfer of the three patients in the group of pregnant women with severe preeclampsia, followed by addressing the issue of timing and method of delivery.

Considering that in 13 pregnant women with type concentric remodeling, reduced performance single and minute cardiac output, ejection fraction on the background of hypertension and increased peripheral vascular resistance, leading to increased left ventricular mass and LVMI, which were indicators of the growth of pathological changes in the circulatory system. These indicators show the progression of the pathological process with the transition into concentric concentric remodeling of the left ventricle geometry type.

In this group of pregnant women against the background of corrective therapy we monitored the study parameters. In all cases, the therapy was effective, as indicated by our data reduction RWT index <0.45 units. (0.39 ± 0.02 units.).

Thus, in our opinion, it is necessary to distinguish between situations where the increase in the number and weight of functioning structures of the myocardium is a compensatory process and when the increasing demands on the heart are responsible for the transition of the adaptive mechanism in the pathological process.

Inadequate marker of cardiovascular adjustment in PE is to develop disproportionately LVM, the formation of isolated diastolic left ventricular dysfunction and the development of circulatory system in all organs and tissues.

Thus, a disproportionately high rate of LVM, in patients with mild pre-eclampsia is as a predictor of severe preeclampsia before its clinical manifestation, and the indication for revision of the tactics of pregnancy.

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Features of renal function and some indicators of homeostasis in women with mild preeclampsia

Abstract: Study of features of renal function, some indicators homeostasis in women with mild preeclampsia. We have studied 50 women with physiological pregnancy, 100 pregnant women with mild PE (II group) in gestational age 30–34 weeks. The results of the data, it should be emphasized that among the numerous violations of various functions of the body of pregnant women with mild preeclampsia. The most prominent is hypovolemia due to preferential reduction of plasma volume, hypoproteinemia due to proteinuria and reduced renal perfusion parameters with the deterioration of their functional capacity.

Keywords: Kidney, renal hemodynamic, homeostasis, renal plasma.