

PECULIARITIES OF HEPATOBILIARY SYSTEM FUNCTIONING DEPENDING ON THE SEVERITY OF PREECLAMPSIA

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ABSTRACT

The article presents results of peculiarities of the hepatobiliary system in pregnant women with preeclampsia. It is set in the pregnant with preeclampsia of mild severity the frequency and combination of two and more complaints was reliably lower comparing to the frequency and combination of complaints in the pregnant with preeclampsia of mean severity. It must be mentioned that the received laboratory data positively correlated with the clinical manifestations of hepatobiliary dysfunction and the level of severity of preeclampsia that makes the further scientific researches necessary in future. Among the ultrasound signs of the dysfunction of the hepatobiliary system the following were detected: hepatomegaly, diffuse changes in the liver, increasing the density of the gallbladder against the decrease in contractility of the formation of sludge.

UDC CODE & KEYWORDS

■ UDC: 616.361-008:618.3:616.8-009.24 ■ Pregnancy ■ Preeclampsia ■ Pathology of the hepatobiliary system

INTRODUCTION

Preeclampsia is one of the common pregnancy complications, it stably takes one of the first places in the structure of maternal mortality. The onset of severe forms in conjunction with poorly manifested clinical symptomatology considerably complicates early diagnostics of preeclampsia, and its resistance to therapy causes the growing of the rate of perinatal and maternity losses and turns preeclampsia into an extremely important medical and social problem. Pregnancy increases the load on most women's organs and liver in the case is not an exception [1-3]. The disturbances of liver functional activity implement into severe metabolism disturbances, the latter accompanied with reduction of disintoxicational function of liver and kidneys contributes to endogenic intoxication syndrome rise [4,5].

Laboratory markers used to estimate liver functional condition allow to diagnose cytolysis while liver damage in preeclampsia is a prolonged process from functional to morphological changes which can be influenced on the early stages of the disease and thus to improve the prognosis for a pregnant and her fetus [6,7]. That is why more accurate definition of liver tissue damage pathogenesis, the search of new early diagnostic criteria for estimation of liver functioning in preeclampsia is a topical direction of the research.

The purpose of the research is to estimate functional activity of hepatobiliary system in the pregnant depending on the severity of preeclampsia.

Materials and methods

There was an open questioning of 247 pregnant women. The 1st group was made of 104 pregnant women with preeclampsia of mild severity, the 2nd group was of 101 pregnant women with preeclampsia of mean severity and a control group was of 42 patients with physiologic course of pregnancy. All of the pregnant women were undergoing a course of medical treatment at Lugansk Regional Maternity and Childhood Centre. The diagnostic criteria of preeclampsia severity estimation corresponded to the National Standards of giving assistance to the pregnant women confirmed by the Ministry of Public Health of Ukraine. We took into account the patient's complaints and characteristics of lipidogram: total cholesterol (TC), triglycerides (TG), high-density lipoproteins (HDL), low-density lipoproteins (LDL) and liver enzymes (ALT). The concentration of very low-density lipoproteins (VLDL) was counted according to W. Friedewald's formula: $VLDL = TG/2,2$. The Index of Atherogenicity was counted according to the formula by A.N. Klimov: $TC - HDL/HDL$ ($N < 3,5$). Ultrasound investigation of liver and gallbladder was conducted with ultrasound scanner Esaote Technos MP 2004 Genua/Italy [8].

Results and discussion

The average age of the examined women was $28 \pm 1,8$ years old. The results of the questioning showed that the patients with preeclampsia expressed different complaints connected with the disturbances of hepatobiliary system. Heartburn, sensation of weight in the right hypochondrium, dull pain in the right hypochondrium and dyspeptic disturbances were noted.

In the pregnant with preeclampsia of mild severity heartburn was registered in 65 cases (62,5%), sensation of weight in the right hypochondrium was seen in 52 (50%) patients, dull pain in the right hypochondrium was observed in 22 (21,1%) women and dyspeptic disturbances were present in 71 (68,2%) examined women. The pregnant women of the 2nd group had the same range of complaints: heartburn in 72 (71,2%) patients, sensation of weight in the right hypochondrium was seen in 64 (63,3%) patients, dull pain in the right hypochondrium was observed in 69 (68,3%) women and dyspeptic disturbances were present in 82 (81,1%) examined women. The results obtained show that the pregnant women of the 1st and the 2nd groups had a definite range of complaints reflecting functional activity of hepatobiliary system, but in the pregnant with preeclampsia of mild severity the frequency and combination of two and more complaints was reliably lower comparing to the frequency and combination of complaints in the pregnant with preeclampsia of mean severity ($P < 0,05$).

Laboratory investigation of lipid blood spectrum and liver enzymes registered increase of low-density lipoproteins, total cholesterol, triglycerides and ALT. Thus, in the pregnant of the 1st group (preeclampsia of mild severity) the rates of TC were $6,5 \pm 0,01$ mmol/l; TG – $1,84 \pm 0,02$ mmol/l; LDL – $3,8 \pm 0,05$ mmol/l; VLDL – $0,83$ mmol/l; HDL – $0,9 \pm 0,05$ mmol/l; AI – $5,5$; ALT – $0,89 \pm 0,03$ mmol/l.

The patients of the 2nd group (preeclampsia of mean severity) the rates were like this: TC were $6,8 \pm 0,04$ mmol/l; TG $2,01 \pm 0,05$ mmol/l; LDL $4,98 \pm 0,75$ mmol/l; VLDL $0,91$ mmol/l; HDL $0,8 \pm 0,04$ mmol/l; AI – $5,8$; ALT – $1,01 \pm 0,04$ mmol/l. The studied indices in the control group were the following: TC were $2,5 \pm 0,01$ mmol/l; TG $1,02 \pm 0,04$ mmol/l; LDL $2,34 \pm 0,55$ mmol/l; VLDL $0,46 \pm 0,09$ mmol/l; HDL $2,34 \pm 0,02$ mmol/l; AI – $5,8$; ALT – $0,13 \pm 0,01$ mmol/l.

Thus, the figures of TC, TG and LDL were reliably higher in the pregnant with preeclampsia of mean severity in the 2nd group comparing to the corresponding figures of the pregnant of the 1st group with preeclampsia of mild severity ($P < 0,05$), the figures of the control group accorded with the abstract norm. Particular attention should be paid to the raise of TG rate, more high level was registered in the patients with preeclampsia of mean severity, that can be the manifestation of lipid-dependent endothelial dysfunction. According to Ray J.G., Diamont P., Singh G. (2006), during normal pregnancy, decrease of lipoprotein-lipase activity and increase of activity of systemic liver lipases responsible for increase of TG synthesis in liver, and decrease of activity of lipoprotein lipases, responsible for decrease of catabolic activity in adipose tissue are registered, which means that hypertriglyceridemia is the mediator of endothelial dysfunction, the degree of hypertriglyceridemia intensity predetermines the degree of preeclampsia severity, the results obtained correspond to the data of other researches [7].

The indices of Atherogenicity Index in pregnant women with mild and mean severity 2-2,5 times exceeded the indices of the control group that is the evidence of deep disturbances of the lipid metabolism in the given group of pregnant women.

It must be mentioned that the received laboratory data positively correlated with the clinical manifestations of hepatobiliary dysfunction and the level of severity of preeclampsia that makes the further scientific researches necessary in future.

According to the US examination of the pregnant of the 2nd group, hepatosplenomegaly was seen in 31 (30,6%) patient and diffuse changes of liver in 24 (23,7%) women. The obtained figures of ultrasound attenuation index fluctuated from $4,1 \pm 0,17\%$ to $17,5 \pm 0,15\%$. The increase of gallbladder wall density on the background of decrease of gallbladder contractile ability and increase of its volume to $16,4 \pm 1,2$ cm³ – $19,2 \pm 2,7$ cm³ was seen in 89 (88,1%) pregnant women. The coefficient of gallbladder homogeneity was decreased and averaged $21,7 \pm 6,1$. As opposed to the patients from the 1st group who mostly had the disturbances of gallbladder motor-evacuative function.

Conclusion

1. The peculiarity of hepatobiliary system functioning in the pregnant with preeclampsia was the presence of characteristic clinic symptomatology: pain syndrome, dyspeptic disturbances, the degree and character of the latter was positively correlated with preeclampsia severity.
2. The disturbances of blood lipid spectrum in the pregnant with preeclampsia were characterized with the increase of the levels of total cholesterol, triglycerides and low-density lipoproteins. The disturbance degree of blood lipid spectrum in the pregnant with preeclampsia was in the direct relation on preeclampsia severity and hepatobiliary system condition.
3. Clinical diagnostics in conjunction with US method of investigation gives the opportunity to estimate hepatobiliary system functioning and in early stages to verify the pathologic changes in the pregnant with preeclampsia and on this base to elaborate the recommendations of therapeutic and preventive measures.

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