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THE CHARACTER OF CORTISOL AND INTERLEUKIN-2 CHANGES IN OBSTETRICAL PATHOLOGY

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Abstract

The gestosis still remains one of the actual problems of obstetrics. Despite the numerous researches devoted to gestosis it is the heaviest complication of pregnancy, labor and postnatal period. It takes the leading place in maternal and perinatal incidence and mortality with insufficiently studied pathogenesis and absence of reliable prognosis methods. Diagnostics of gestosis in stage of clinical manifestations generally presents no difficulties, but it is often overdue.

The premature rupture of foetal membrane is a loss of foetal membrane containment and rupture of amniotic fluids prior to onset of the labor, irrespective of gestation term. The combination of various factors is observed more often because majority of the authors believe that the only reason of amniotic fluids antenatal rupture doesn't exist.

Nowadays the participation of steroid hormones and cytokines in pathogenesis of many obstetric, perinatal and postnatal complications is well-known. Hundred and forty women with full-term pregnancy were observed in Beglaryan Medical Center from 2012 to 2014.

The serum and amniotic fluid were the materials of the research, in which concentration of cortisol and interleukin-2 levels were defined with the use of the enzyme multiplied immunoassay method.

The observed contingent was divided into 4 groups depending on the identified obstetric pathology: I group - 30 pregnant women with gestosis, II group - 35 women with premature rupture of the amniotic membranes, III group - 25 women, with combination of gestosis and premature outpouring of the amniotic fluid. Control group was consisted of 50 women with physiological pregnancy.

The cortisol concentration in serum in all groups wasn't significantly changed ($p>0.05$).

The hormone concentration increased almost by 3 times in women with gestosis in comparison with obstetric patient of the control group. The synchronous increase of noted indicators was established only in I group with the premature rupture of amniotic membranes and with combination of these pathologies by consideration of dynamics of cortisol and IL-2 levels changes in obstetric patient with gestosis.

Analyzing the existing scientific data and available literature data it is possible to note that pathogenesis of gestosis and premature rupture of amniotic membranes are managed in systemic inflammation response syndrome. The importance of immune alterations and cytokine regulation imbalance of gestation processes was revealed in pregnants' late gestosis. During the determination of cytokines synthesis in serum of pregnants with gestosis 2.5-fold increase was fixed in comparison with the recieved indices in group of patients with physiological pregnancy.

The modern definition of cytokine response and cortisol concentration in amniotic liquid will allow to prevent the development of complications during gestation.

Keywords: *cortisol, interleykin-2, gestosis, premature rupture of foetal membranes.*

Introduction

The gestosis still remains one of the actual problems of obstetrics. Despite the numerous researches devoted to gestosis it is the heaviest complication of pregnancy, labor and postnatal period. It takes the leading place in maternal and perinatal incidence and mortality with insufficiently studied pathogenesis and absence of reliable prognosis methods. Diagnostics of gestosis in stage of clinical manifestations generally presents no difficulties, but it is often overdue. In this regard, the search of early predictors of this complication of

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pregnancy and development of preventive actions on the basis of them is still actual [*Yu CK et al., 2008; Hentges CR et al., 2015; Platz M et al., 2015; Vigil-De Gracia P, Ludmir J, 2015*].

The premature rupture of foetal membranes, violation of foetal membrane integrity and outpouring of amniotic fluids prior to onset of labor, irrespective of gestation term are not less important. The combination of various factors is observed more often because majority of the authors believe that the only reason of amniotic fluids antenatal rupture doesn't exist. Premature rupture of foetal membranes remains one of the most important problems in obstetric practice. It is the most common reason of premature delivery and heavy complications at newborns. Meanwhile, the clear idea of prognosis, diagnostics and treatment of premature rupture of foetal membranes still doesn't exist. Neither of the countries in the world had solved this problem despite extensive knowledge about premature rupture of foetal membranes reasons and mechanisms up to the present moment [*Aleev I, 2011; De Waal K, Kluckow M, 2015; Zhonghua F et al., 2015*].

Nowadays the participation of steroid hormones and cytokines in pathogenesis of many obstetric, perinatal and postnatal complications is well known [*Dodic M et al., 2002; Moritz K et al., 2002; Shmagel K, Chereshnev V, 2004; Alexander V et al., 2006; Myatt L, 2006; Varvarina G et al., 2014*].

The noted aspects predetermined the purpose of the research which consists of characteristic changes of cortisol concentration and interleykin-2 (IL-2) levels in obstetric patient with gestosis and premature rupture of foetal membranes and possibility to use them as prognostic index of obstetric pathology development.

MATERIALS AND METHODS

Hundred and forty women with full-term pregnancy were observed in Beglaryan Medical Center from 2012 to 2014. The serum and amniotic fluids of obstetric patient were used as research material. The serum and amniotic fluids were the materials of the research.

Surveyed contingent was divided into 4 groups depending on the identified obstetric pathology: I group - 30 pregnant women with preeclampsia, II - 35 women, with premature rupture of the amniotic membranes, III - 25 women, with combination of gestosis and premature outpouring of the amniotic fluid and control group consisted of 50 women with physiological pregnancy.

The obtained data of IL-2concentration was compared in serum and amniotic fluids depending on the present obstetric pathology.

The serum and amniotic liquid were analyzed with enzyme multiplied immunoassay (ELISA) method for IL-2 and cortisol with the usage of DRG-Internetional Inc., (USA) kit-complects. The Levels of the studied indicators were defined with the automatic Stat-Fax 2600 analyzer (USA) at 450 *nm* wavelength.

Statistical analysis was carried out by Styudent's criteria with the use of SPSS-16.0 programs.

RESULTS AND DISCUSSION

The obtained data of cortisol and IL-2 levels changes in women in labor with gestosis and the premature rupture of foetal membranes in women of the allocated clinical groups are in table.

The concentration of cortisol in serum in all groups wasn't significantly changed as it is seen in the presented data ($p>0.05$).

The hormone level changes in amniotic fluid appeared as a more sensitive indicator. The hormone concentration increased almost by 3 times in comparison with women in labor of the control group and reached 424.4±65.3 *nmol/l.* At the same time reliable changes of the considered indicator weren't established in the premature rupture of foetal membranes.

The significant increase of cortisol content to 227.0±29.2 *nmol/l* (more than 1.5 times) in women in labor with combined pathology (proceeding from above given results) is explained with the influence of hormone fraction connected with development of gestosis.

IL-2 levels in serum in the considered groups were not significantly changed and corresponded to the range from 17.9±2.4 *pg/ml* in the II group to 23.5±3.34 *pg/ml* in the control group.

Reliable changes of this parameter are defined in amniotic fluids only in the group of women in labor with gestosis among which concentration of IL-2 increased to 33.1±2.94 *pg/ml*.

The synchronous increase of noted indicators only in I group was established with the premature rupture of amniotic membranes and combination of these pathologies by consideration of dynamics

Table.

Cortisol and interleukin-2 levels in serum and amniotic liquid in obstetric patient

Study subject	Control group n=50	I group n=30	II group n=35	III group n=25
		cortisol level		
Serum	1166.2±128.9	1147.3±150.3 p>0.4	1037,7±165,7 p>0.4	1023.9±279.8 p>0.4
Amniotic liquid	147.9±21.5	424,4±65.3 p<0.0005	355.6±143.3 0.05>p>0.025	227.0±29.2 0.05>p>0.025
		interleukin-2 level		
Serum	20.3±1.6	18.7±1.9 0.4>p>0.25	18.1±1.8 0.25>p>0.1	17.9±2.4 0.25>p>0.1
Amniotic liquid	23.5±3.3	33.1±2.9 0.05>p>0.025	25.75±4.1 0.4>p>0.25	15.4±1.6 0.05>p>0.025

Notes: *p – is the relation of I, II and III groups measures to the control group.*

of cortisol and IL-2 levels changes in obstetric patient with gestosis.

It is known that pregnancy is followed by considerable changes in woman organism: increase of body weight, delay of sodium and potassium, increase of cardiac output, speed of the lymph flow and blood volume. These changes undoubtedly are hormone-driven which was noted in the example of cortisol.

The majority of researchers believe that two main tendencies are realized directly in the mechanism of the premature birth development: the prevalence of non-inflammatory and infectious reasons. The concept of premature birth development for non-inflammatory genesis is also considered. The main factor of starting the labor is the corticotropin releasing-hormone and cytokines.

Summarizing the existing scientific data, it is possible to note that pathogenesis of gestosis and premature rupture of amniotic membranes is managed in systemic inflammation response syndrome. The importance of immune alterations and cytokine regulation imbalance of gestation processes was revealed in pregnants' late gestosis. The synthesis of cytokines in serum in pregnants with gestosis was about 2.5 times more than in group of patients with physiological pregnancy.

Cortisol level also served as a sensitive marker in the amniotic fluid. The concentration of hormone has undergone significant changes in all clinical groups, but the most expressed increase (3-fold) is set up in the presence of preeclampsia compared to the control group.

The determination of the cytokine profile will predict such complications gestation as preeclampsia and premature rupture of membranes by measuring IL-2 and cortisol concentrations in the am-

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