

Features of the Hormonal Background During Premature Rupture of Amniotic Fluid

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Premature rupture of amniotic fluid is not only a medical, but also a social problem, which is primarily due to its consequences for children - perinatal morbidity and mortality in premature newborns is 35-40 times higher than in full-term ones [2, 3, 4, 5]. Premature birth (PB) is the main problem of perinatology in the world. At least every tenth child (11.1%) is born prematurely [1,6]. PTB is the leading cause of child mortality worldwide [2,7]. Premature infants also have an increased risk of death from other causes, especially infectious complications[3,8]. Reducing the number of premature births, as well as complications in premature babies, can be achieved by: timely diagnosis and treatment of the threat of premature termination of pregnancy; optimal methods of delivery, taking into account the gestational age and obstetric situation; timely diagnosis and correction of isthmic-cervical insufficiency (ICI); expectant management in case of premature rupture of amniotic fluid and premature pregnancy; treatment of premature babies in intensive care units and neonatal intensive care units using modern technologies; follow-up of premature newborns in the second stage of nursing. Diagnosis of preterm labor is fraught with certain difficulties, since symptoms reminiscent of the onset of preterm labor often occur during normal pregnancy. Hormones of the fetoplacental system are important in the formation and development of pregnancy. The leading role in the gestation process is played by steroid hormones - estrogens, progesterone and peptide hormones - human chorionic gonadotropin and placental lactogen. Estrogens determine the growth, maturation and ovulation of the egg, take part in the regulation of progesterone biosynthesis, affect immunocompetent cells, regulate biochemical processes in the myometrium, increase the level of uteroplacental blood flow and the volume of circulating blood, and prepare the pregnant woman's body for childbirth. The level of estrogen, especially the main fraction - estriol, synthesized by the placenta from the second trimester of pregnancy, increases significantly towards the end of pregnancy [3, 4, 7]. Progesterone, being the main hormone of pregnancy, ensures decidual transformation of the endometrium and preparation for implantation of the fertilized egg, promotes the development and vascularization of the endometrium, reducing the tone and excitability of the myometrium, and maintains the tone of the isthmic-cervical region. Progesterone provides immune tolerance of the mother's body to the developing fetus and local hemostasis in the endometrium, is a precursor to the synthesis of fetal steroids [2, 6]. Chorionic gonadotropin, being a glycoprotein, from early gestation stimulates the functional activity of the corpus luteum and the production of progesterone, promotes the synthesis of estrogens in the fetoplacental complex and the process of aromatization of androgens of fetal origin, influences the functional activity of the gonads and adrenal glands fetus. Chorionic gonadotropin helps to inhibit the immunological reactions of a pregnant woman by inducing suppressor T cells and plays the role of a new immunosuppressant in the prevention of immunoconflict and fetal rejection. Human chorionic gonadotropin level up to 10-12 weeks. pregnancy

increases, after which it is maintained at a certain level until the end of pregnancy [1, 6, 8]. Placental lactogen helps stimulate the formation of the secretory parts of the mammary glands in pregnant women, regulates carbohydrate and lipid metabolism, being a metabolic hormone that provides energy resources for the growth and development of the fetus [8].

The purpose of the study was to determine the characteristics of hormonal levels during premature rupture of amniotic fluid.

Materials and methods. We examined 86 patients with threatened miscarriage (main group) and 42 patients with physiologically progressing pregnancy (control group) at gestation periods from 22 to 35 weeks. Clinical and diagnostic criteria for threatened miscarriage were: pain of various types in the lower parts of the abdomen and lower back, irregular a clear increase in myometrial tone, confirmed by objective data (uterine contractions during cardiotocographic study, local tone myometrium according to ultrasound data). The objects of the study were venous blood serum taken on an empty stomach in the morning. Hormones of the fetoplacental complex were determined by enzyme immunoassay using a kit from Human (Germany). Results and discussion In the main group, 41 (47.6%) patients underwent studies in the second trimester of gestation, and 45 (52.3%) - in the third trimester of pregnancy. The average age of patients in the main group was 25.13 ± 0.9 years, in the control group - 27.42 ± 1.01 years. In the examined groups of patients, an analysis of the structure of the extragenital pathology, obstetric and gynecological history and the nature of the pregnancy. Primiparas in the main group accounted for 68%, of which 17.6% were primigravidas. Among those examined in the main group, in 33 (36.7%) patients, the threat of miscarriage was registered from 12 weeks, in 67 (77.9%) it persisted in the second trimester. 26 (30%) patients suffered from combined extragenital pathology: neurocirculatory dystonia of the hypotonic type, diseases of the urinary system, endocrinopathies, diseases of the upper respiratory tract and varicose veins. 79 (91.8%) patients of the main group had gynecological diseases: chronic inflammatory diseases of the genital organs, menstrual irregularities, primary or secondary infertility, uterine fibroids. Had a scar on the uterus 8 (9.3%) women, in 3 (3.4%) pregnancy occurred after stimulation of ovulation. Previous treatment for various genital infections was carried out in 39 (45.3%) female patients. All patients of the main group were burdened by the presence of artificial and spontaneous abortions. 31 (36.3%) patients had one or more medical abortions, 28 (32.1%) had one spontaneous miscarriage, 27 (31.6%) had two or more spontaneous miscarriages. The analysis showed that the most common concomitant obstetric pathology in patients of the main group was placental insufficiency- in 72.6%, gestational anemia - in 38.1%, gestosis of varying severity - in 21.6%. All patients with threatened miscarriage received complex pathogenetic therapy according to the generally accepted scheme. In order to study the characteristics of changes in hormones of the fetoplacental complex, the levels of estriol, progesterone, human chorionic gonadotropin and placental lactogen were determined. In uncomplicated pregnancy (control group), the average level of hormones in the II (22-26 weeks) and III (27-35 weeks) trimesters of gestation is presented in Table. 1.

Table 1 Hormone content during physiological pregnancy

Index	Gestation period	
	22-26 weeks (n=42)	27-35 weeks (n=42)
Estriol (nmol/l)	$38,12 \pm 3,71$	$57,24 \pm 3,95^*$
Progesterone (nmol/l)	$59,28 \pm 5,24$	$116,41 \pm 7,21^*$
Human chorionic gonadotropin (mIU/ml)	39000 ± 1200	34000 ± 1100
Placental lactogen (mg/l)	$5,81 \pm 0,35$	$8,72 \pm 0,54$

Note. *—differences are statistically significant ($p < 0.05$).

Table 2 Hormone content during threatened miscarriage

Index	Gestation period	
	22-27 week (n=86)	35 week (n=86)
Estriol (nmol/l)	26,31±2,14	45,51±2,89*
Progesterone (nmol/l)	44,21±3,21	38,19±2,84
Human chorionic gonadotropin (mIU/ml)	21100±1100	12500±850*
Placental lactogen (mg/l)	5,65±0,41	7,24±0,83

If there is a threat of miscarriage in the main group at a gestational age of 22-27 weeks. We have established a decrease in the level of steroid and peptide hormones: estriol, progesterone, human chorionic gonadotropin. In the group of patients with threatened miscarriage at a gestation period of 28-35 weeks. Most values of the hormones studied were greatly reduced. Thus, despite significant fluctuations in the level of hormones of the fetoplacental complex, their decrease has been established in case of threatening premature birth, more pronounced with increasing gestational age.

Conclusions. Studies have confirmed the development of a threat of premature birth in patients with antenatal risk factors. The results of laboratory data show the diagnostic value of determining hormone levels fetoplacental complex in patients with threatened miscarriage.

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