

## **Diagnostic Significance of Indicators of the Fetoplacental System in Preterm Birth**

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### Article Information

**Received:** March 23, 2023

**Accepted:** April 22, 2023

**Published:** May 23, 2023

### Keywords

*premature birth, premature baby, USE of the fetal brain, Doppler blood flow in the cerebral vessels, hypoxic-ischemic lesions of the central nervous system, drugs*

### ABSTRACT

Abstract presents the result of the use of prenatal articles for predicting neurological outcomes in preterm labor using ultrasound Doppler studies. Currently, it is obvious that not only the development of examination of premature infants, but also algorithms for antenatal assessment of the state of the fetal brain to predict unfavorable neurological outcomes is evident. Morphological ultrasound and Doppler characteristics of the CNS have been identified against the background of threatening preterm birth, depending on the gestational age at the time of birth, and subsequent neurological disorders of premature babies. The most indicative were changes in the Ventriculo-cranial index, the width of the anterior horns of the lateral ventricles of the brain, thalamo-occipital size, SD of the vessels of the vertebrobasilar basin of the brain. Similar detailed perinatal diagnostics contributes to non-invasive prediction of the degree of neurological damage to the central nervous system of premature infants.

**Relevance:** Preterm birth (PR) is the main problem of perinatology in the world. (1,6,7,15,17) Preterm birth is not only a medical but also a social problem, which is primarily associated with their consequences for children - perinatal morbidity and mortality in premature newborns is 35-40 times higher than in full-term ones (2,3 ,4,5,14) .Cerebral circulation disorders are the leading mechanism for the formation of brain damage in the perinatal period, developing in 50-60% of premature newborns. In threatening delivery, there are various blood flow disorders in the mother-placenta-fetus system with the development of intrauterine hypoxia and placental insufficiency, which, against the background of labor complications, determines an increase in the frequency of birth of premature newborns in asphyxia, followed by the development of post- hypoxic CNS lesions. Disability of children due to perinatal lesions of the

nervous system is 35-40% (11,12,13,18). At the same time, the decrease in perinatal mortality in the category of premature babies contributed to the growth of perinatal and childhood morbidity. In case of untimely revealing the late start of treatment and rehabilitation measures, there is a high probability of developing violations of the formation of higher mental functions. (8,9,10,16).

**The purpose of the work:** explore the state of the fetoplacental system in preterm birth, depending on the gestational age in order to prevent perinatal losses.

**Materials and methods:** In order to study the state of the fetoplacental system, 150 pregnant women were examined. Group 2 - 35 women with early preterm labor at 28-33 weeks; group 3 - 35 women with preterm labor at 34-37 weeks; 4 group of 50 women with physiological childbirth in the period of 38-40 weeks; To assess the state of the fetoplacental system, an ultrasound examination, dopplerometry in the dynamics of pregnancy, and histopathological examination of the placenta were performed. Conducted ultrasound studies showed that placental disorders (thinning, thickening, reduction or increase in the size of the placentas in all the studied groups occurred 2.5-3 times more often than in the control group ( $p < 0.05$ ). and the frequency of placental insufficiency: with a decrease in gestational age, the frequency of placental disorders increases ( $p < 0.005$ ). Most often, the placenta was attached to the anterior and posterior walls of the uterus, sometimes with the transition to one of the sidewalls. placentation and placenta previa were more common in preterm birth, which coincides with the literature data [1]. We have studied the rate of fetal growth according to the results of ultrasound at the screening time in 150 pregnant women. Compliance with the parameters of the physiological development of the fetus according to the results of ultrasound was detected in the majority of pregnant women in groups 1 and 4, in groups 2 and 3, compliance with the parameters of the physiological development of the fetus was observed less often statistically significant ( $p < 0.05$ ). In group 2, the syndrome of fetal growth retardation (SFGR) I st. was detected by ultrasound in every fifth woman (21.4%), 2 times more often than in groups 1, 3 and 4 (7.7%, 11.2% and 9.7%), statistically significant differences were obtained in z-test ( $p < 0.05$ ) and  $\chi^2$  test ( $p < 0.005$ ). Identification of SFGR I st. up to 33 weeks, according to the results of ultrasound, it can serve as a prognostic sign of early preterm labor ( $p < 0.05$ ). When assessing the amount of amniotic fluid, oligohydramnios was diagnosed in every third pregnant woman of the 2nd group (33.9%), which is 3 times more often than in the control group (12.7%) and 2 times more often than in group 1 (18.3%), differences were confirmed by z-test ( $p < 0.05$ ).

**Results:** Thus, in early preterm birth, pregnant women had ultrasound markers of placental insufficiency, manifested by changes in the structure of the placenta (thinning and decrease in area - 11.6%), determination of the II degree of placental maturity up to 33 weeks (27.9%), a change in the amount of amniotic fluid towards oligohydramnios (24.0%), fetal malnutrition (32.5%) and an increase in the resistance index in the uterine arteries and umbilical cord arteries (20.4%). amounting to 93.3%, in contrast to the 2nd group, where normal values were statistically significantly less common (79.6%), the differences were confirmed by the z-test ( $p < 0.05$ ) and the  $\chi^2$  test ( $p < 0.005$ ). The frequency of normal Doppler parameters in groups 1 and 4 correlates with the frequency of normal fetometric parameters in these groups. In group 2, a violation of the fetoplacental blood flow (BF) was detected in every fifth pregnant woman

(20.4%), of which half of the pregnant women (10.7%) had stage 3 BF, which required delivery. In group 1, degree 3 BF was detected in 6.7% of cases. In group 3, BF of the 2nd degree was more common - in 6% of pregnant women, in the control group, blood flow disorders in the uterine arteries (BF of the 1st degree) were more often observed - in 6.0% of cases.

Thus, morphological differences in the placenta according to the timing of preterm birth were revealed: inflammatory changes in the placenta (83.7%) are characteristic of very early preterm birth. Involutive - dystrophic changes characteristic of chronic placental insufficiency were statistically significantly more common in the group of early preterm birth (65.5%) and in preterm birth at 34-37 weeks (69.8%). In early preterm birth, ultrasound markers of placental insufficiency were detected: changes in the structure of the placenta (thinning and a decrease in area - 12.6%), determination of the II degree of placental maturity up to 33 weeks (37.9%), oligohydramnios (37.9%), fetal hypotrophy (32.0%), impaired fetoplacental blood flow (20.4%)

**Conclusions:** Risk factors for perinatal pathology of the central nervous system in premature newborns are combined somatic and gynecological pathology, smoking.

1. The severity of the degree of CNS damage in premature babies depends on the gestational age at birth, hemodynamic disorders in the vessels of the vertebrobasilar basin, occurring against the background of threatening preterm birth.

2. In the presence of a threat of preterm labor, there is a decrease in blood flow velocities in the arterial vessels of the fetal central nervous system, a decrease in blood outflow in the venous vessels.

3. Of hypoxic or hypoxic traumatic genesis were more often observed. The leading syndromes of CNS damage were CNS depression syndrome - in 83 (56.08 %), increased neuro-reflex excitability syndrome - in 39 (26.35%), convulsive syndrome - in 4 (2.7%), vegetative-visceral syndrome - in 8 (10.81%) %, muscle dysfunction syndrome – in 6 (4.05%) cases.

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