



INTEGRATED ASSESSMENT OF UTEROPLACENTAL AND FETOPLACENTAL BLOOD FLOW IN FETAL GROWTH RESTRICTION

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Abstract: *Fetal Growth Restriction (FGR) remains a significant clinical concern in modern obstetrics due to its association with high rates of perinatal morbidity and mortality. The failure of a fetus to reach its genetically determined growth potential is often the result of placental insufficiency, which leads to chronic fetal hypoxia. In this context, evaluating uteroplacental and fetoplacental blood flow using Doppler ultrasound is one of the most informative non-invasive methods for early diagnosis, monitoring, and prognosis.*

Keywords: *fetal growth restriction, Doppler ultrasound, uteroplacental circulation, fetal hemodynamics, antenatal diagnosis, placental insufficiency, perinatal outcomes.*

This prospective study included 32 pregnant women aged 21 to 40 years (mean age 30.3), all diagnosed with FGR and treated at the Republican Specialized Scientific and Practical Medical Center of Maternal and Child Health. The diagnostic workup consisted of standard ultrasound fetometry, placental thickness and structure assessment, amniotic fluid volume measurement, cardiotocography (CTG), and Doppler studies of the uterine arteries, umbilical artery, and fetal middle cerebral artery. Clinical and perinatal outcomes were assessed in correlation with Doppler findings.

Among the examined patients, grade III abnormalities in uterine and umbilical artery blood flow and signs of blood flow redistribution (brain-sparing effect) in the fetal middle cerebral artery were identified as key markers of fetal compromise. Severe oligohydramnios was observed in 34.3% of cases, and ultrasound signs of placental pathology were present in a smaller subset. Seven newborns required mechanical ventilation for an average of seven days, and two cases resulted in intrauterine fetal demise. Doppler and ultrasound markers showed a strong correlation with neonatal Apgar scores, the need for intensive care, and early neonatal complications such as respiratory distress syndrome, central nervous system injury, and intraventricular hemorrhage.

Our findings confirm that combined use of Doppler ultrasound and CTG significantly improves the ability to identify fetuses at risk of adverse outcomes. Moreover, such integrated antenatal monitoring allows for timely decisions regarding the mode and timing of delivery. The study highlights the importance of incorporating Doppler screening into routine management protocols for pregnancies complicated by FGR, especially in the presence of additional maternal or placental risk factors.





MODERN PROBLEMS IN EDUCATION AND THEIR SCIENTIFIC SOLUTIONS

Further prospective studies are needed to investigate angiogenic and endothelial biomarkers, which may enhance early prediction and guide individualized management of FGR. Optimizing neonatal outcomes in FGR remains a multidisciplinary challenge that requires close cooperation between obstetricians, neonatologists, and perinatologists.

REFERENCES:

1. Ignatko I.V., Kardanova M.A., Miryushchenko M.M., Baibulatova Sh.Sh. Pathogenesis, diagnosis, and perinatal outcomes in critical fetal condition // Arch. Obstet. Gynecol. named after V.F. Snegirev. – 2015. – No. 4. – Pp. 43–44.
2. Kardanova M.A. Comprehensive assessment of the fetoplacental system in predicting perinatal outcomes in critical fetal condition: Dissertation ... Candidate of Medical Sciences. – Moscow; 2015. – 190 p.
3. Medvedev M.V., Kuryak A., Yudina E.V. Doppler Ultrasound in Obstetrics. – Moscow: Real Time, 1999. – 160 p.
4. Strizhakov A.N., Davydov A.I., Belotserkovtseva L.D., Ignatko I.V. Physiology and Pathology of the Fetus. – Moscow: Medicina, 2004. – 356 p.
5. Syundyukova E.G., Medvedev B.I., Sashenkov S.L. et al. Dopplerometric indices of uteroplacental and fetoplacental blood flow in pregnancies complicated by preeclampsia // Bulletin of South Ural State University. – 2013.
6. Unanyan A.L., Arakelov S.E., Polonskaya L.S. et al. Placental insufficiency: features of etiopathogenesis, therapy, and prevention // Consilium Medicum. – 2015. – Vol. 17, No. 6. – Pp. 37–40.
7. Khitrov M.V., Okhapkin M.B., Karpov A.Yu. Dopplerometry in obstetrics: a critical view // Ultrasound. Diagnostics in obstetrics, gynecology, and pediatrics. – 2000. – No. 1. – Pp. 49–53.
8. ISUOG Practice Guidelines: diagnosis and management of small-for-gestational-age fetus and fetal growth restriction // Ultrasound Obstet. Gynecol. – 2020. – Vol. 56. – Pp. 298–312. Published online in Wiley Online Library (wileyonlinelibrary.com).

