"GLOBAL HEALTH AND MODERN MEDICINE: INNOVATIONS AND PERSPECTIVES"
International Conference titled

Website:https://worldsiencepub.com/index.php/isngcs September edition,2026

CLINICAL ASSESSMENT OF THE FUNCTIONAL STATE OF THE FETAL-PLACENTAL SYSTEM IN PREECLAMPSIA

Qaxxorova Gulshanoy Mamajon qizi
Central Asian Medical University, International Medical University,
Resident in Obstetrics and Gynecology
Email: gulshanoy1997@icloud.com
Scientific Supervisor: **Ismailova Shoira Tolkunovna**
PhD, Associate Professor, Head of the Department of Obstetrics,
Gynecology, and Neonatology
Email: ismoilovasht7227@gmail.com
ORCID: https://orcid.org/0000-0002-9819-7563

Annotation: This study evaluates the functional state of the fetal-placental system in pregnancies complicated by preeclampsia and examines its clinical significance for maternal and fetal monitoring. Particular attention is given to placental perfusion, fetal growth, fetal cardiac activity, and uteroplacental and fetoplacental blood flow. Modern diagnostic methods, including ultrasonography, Doppler assessment, and cardiotocography, are considered important tools for identifying early changes in fetal and placental function. The assessment of these parameters may help determine the severity of fetal compromise, identify pregnancies at increased perinatal risk, and support individualized obstetric management.

Keywords: Preeclampsia, fetal-placental system, placental perfusion, fetal growth, Doppler assessment, cardiotocography, fetal monitoring, perinatal outcomes.

Introduction

Preeclampsia is one of the important hypertensive complications of pregnancy and may pose a serious risk to both maternal and fetal health. In this condition, maternal vascular and microcirculatory abnormalities may impair placental blood flow and consequently affect the delivery of oxygen and nutrients to the fetus. Assessment of the functional state of the fetal-placental system is important for determining the severity of preeclampsia, detecting fetal abnormalities at an early stage, and selecting the appropriate strategy for further pregnancy management. Impaired placental blood flow associated with preeclampsia may increase the risk of fetal growth restriction, fetoplacental insufficiency, fetal hypoxia, and other perinatal complications. Therefore, regular assessment of fetal growth, cardiac activity, placental condition, and uteroplacental and fetoplacental circulation is an important component of clinical monitoring. Ultrasonography, Doppler assessment, and cardiotocographic monitoring allow comprehensive evaluation of the functional state of the fetal-placental system.

Relevance

Preeclampsia is a significant obstetric condition that may adversely affect both maternal and fetal health, particularly through impaired placental circulation. Regular assessment of the fetal-placental system using ultrasound, Doppler examination, and cardiotocography can help detect changes in fetal condition at an early stage.

Main part

Functional disturbances of the fetal-placental system in preeclampsia are mainly associated with impaired placental blood flow and reduced uteroplacental perfusion. During normal pregnancy, remodeling of the uterine spiral arteries ensures an adequate blood supply to the placenta, whereas in

© 2026lobal Health and Modern Medicine: Innovations and Perspectives. All Rights Reserved.

preeclampsia, disruption of this process may lead to placental hypoperfusion and ischemic changes. As a result, the ability of the placenta to deliver sufficient oxygen and nutrients to the fetus may be reduced. Impaired uteroplacental circulation may increase the risk of fetoplacental insufficiency, fetal growth restriction, and fetal hypoxia. As the severity of the disease increases, functional abnormalities within the fetal-placental system may become more pronounced. Therefore, assessment of maternal blood pressure alone is not sufficient in preeclampsia; fetal growth, placental condition, and blood flow should also be evaluated comprehensively. Early identification of pathophysiological changes within the fetal-placental system allows individualized pregnancy surveillance and timely adjustment of obstetric management. In this context, assessment of placental perfusion and fetoplacental circulation represents an important component of managing pregnancies complicated by preeclampsia.

Modern instrumental methods are used in combination to assess the functional state of the fetal-placental system in preeclampsia. Ultrasonography allows evaluation of fetal biometric parameters, growth patterns, amniotic fluid volume, and the general condition of the placenta. Measurement of fetal head dimensions, abdominal circumference, and femur length helps determine whether fetal growth is appropriate for gestational age. Doppler assessment is particularly important for evaluating uteroplacental and fetoplacental blood flow. Changes in blood flow parameters within the uterine and umbilical arteries may indicate impaired placental perfusion. When clinically indicated, blood flow in the fetal middle cerebral artery may also be assessed. Cardiotocography is used to monitor fetal cardiac activity dynamically and to identify possible signs of fetal hypoxia. Parameters such as baseline fetal heart rate, variability, accelerations, and decelerations provide important information about fetal condition. Combining these methods allows a more comprehensive clinical assessment than relying on a single diagnostic technique. Repeated monitoring helps identify changes in fetal and placental status over time. Dynamic surveillance is particularly important in cases of severe preeclampsia or fetal growth restriction. Modern diagnostic methods make it possible to assess pregnancy-related risks in a timely manner and modify obstetric management when necessary.

Regular monitoring of fetal condition in pregnancies complicated by preeclampsia is essential for reducing maternal and fetal risks. The frequency of surveillance should be individualized according to the severity of preeclampsia, gestational age, fetal growth, and the presence of additional risk factors. Monitoring fetal biometric parameters by ultrasound allows assessment of growth dynamics. Doppler examination helps evaluate fetal risk by identifying changes in uteroplacental and fetoplacental blood flow. Cardiotocography is also an important method for monitoring functional changes in fetal cardiac activity. If fetal growth restriction, worsening blood flow, or abnormal cardiac activity is detected, intensified surveillance may be required. The maternal clinical condition should be assessed simultaneously, with particular attention to blood pressure and the severity of preeclampsia. When fetal condition remains stable, careful antenatal surveillance may be continued. However, deterioration of maternal or fetal condition requires an individualized assessment of the risks and benefits of continuing the pregnancy versus proceeding to delivery. The timing and mode of delivery should be selected according to gestational age, fetal condition, placental blood flow, and the overall maternal clinical status. Monitoring fetal heart activity during labor is also important because it allows early detection of intrapartum fetal deterioration. Thus, comprehensive monitoring and individualized obstetric management are essential components of reducing perinatal complications in pregnancies complicated by preeclampsia.

Conclusion

© 2026lobal Health and Modern Medicine: Innovations and Perspectives. All Rights Reserved.

Assessment of the functional state of the fetal-placental system in preeclampsia is important for evaluating fetal development and determining perinatal risk. Impaired uteroplacental and fetoplacental circulation may increase the risk of fetal growth restriction and hypoxia. The combined use of ultrasonography, Doppler assessment, and cardiotocography allows early identification of changes in fetal condition. Dynamic monitoring provides a basis for individualized decisions regarding continuation of pregnancy and the timing and mode of delivery. Therefore, regular assessment of the fetal-placental system in preeclampsia may contribute to reducing adverse maternal and perinatal outcomes.

References

1. Magee L.A., Brown M.A., Hall D.R. et al. The 2021 International Society for the Study of Hypertension in Pregnancy classification, diagnosis & management recommendations for international practice // Pregnancy Hypertension. - 2022. - Vol. 27. - P. 148–169.
2. Poon L.C., Magee L.A., Verlohren S. et al. A literature review and best practice advice for second and third trimester risk stratification, monitoring, and management of pre-eclampsia // International Journal of Gynecology & Obstetrics. - 2021. - Vol. 154, Suppl. 1. - P. 3–31.
3. American College of Obstetricians and Gynecologists. Gestational Hypertension and Preeclampsia. Practice Bulletin No. 222 // Obstetrics & Gynecology. - 2020. - Vol. 135, No. 6. - P. e237–e260.
4. American College of Obstetricians and Gynecologists. Indications for Outpatient Antenatal Fetal Surveillance. Committee Opinion No. 828 // Obstetrics & Gynecology. - 2021. - Vol. 137, No. 6. - P. e177–e197.
5. Society for Maternal-Fetal Medicine. Martins J.G., Biggio J.R., Abuhamad A. Society for Maternal-Fetal Medicine Consult Series #52: Diagnosis and management of fetal growth restriction // American Journal of Obstetrics and Gynecology. - 2020. - Vol. 223, No. 4. - P. B2–B17.

© 2026lobal Health and Modern Medicine: Innovations and Perspectives. All Rights Reserved.