

CONTEMPORARY APPROACHES TO EARLY DETECTION OF PLACENTAL INSUFFICIENCY AND FETAL GROWTH DISORDERS

Iminova Nargiza Bakhodir kizi
Andijan State Medical Institute

Abstract: Placental insufficiency (PI) is one of the major causes of perinatal morbidity and mortality, often resulting in fetal growth restriction (FGR) and impaired intrauterine development. Timely identification of these complications is crucial for preventing fetoplacental dysfunction and improving pregnancy outcomes.

Objective. To improve the effectiveness of early detection of placental insufficiency and fetal growth restriction through an integrated evaluation of biochemical, ultrasound, and Doppler indicators, and to develop predictive criteria for their early diagnosis.

Materials and Methods: The study included 120 pregnant women at 11–14, 20–24, and 30–34 weeks of gestation with varying levels of risk for PI and FGR. All participants underwent a comprehensive assessment including:

- clinical and anamnestic evaluation of obstetric and somatic risk factors;
- biochemical testing for PAPP-A, PlGF, and sFlt-1 levels with calculation of the sFlt-1/PlGF ratio;
- ultrasound examination to assess fetal biometry and growth rate;
- Doppler ultrasound of uterine, umbilical, and middle cerebral arteries with calculation of the cerebroplacental ratio (CPR);
- when indicated, assessment of endothelial and immune markers (antiphospholipid antibodies, endothelin-1).

Results: Women with low PAPP-A (<0.5 MoM), reduced PlGF, and elevated sFlt-1/PlGF ratio (>38) exhibited early signs of uteroplacental circulation disturbances before 20 weeks of gestation. These cases were more frequently associated with the development of FGR and chronic PI in the third trimester. A decreased cerebroplacental ratio (CPR <1.1) strongly correlated with biochemical markers of angiogenic imbalance and served as a predictor of fetal hypoxia. The proposed predictive model identified the risk of PI and FGR with 87.3% sensitivity and 82.5% specificity in the first and second trimesters.

Conclusion: An integrated approach combining biochemical, ultrasound, and Doppler parameters significantly enhances the early diagnosis of placental insufficiency and fetal growth restriction. The inclusion of angiogenic biomarkers (PlGF, sFlt-1) together with hemodynamic assessment allows for the identification of high-risk pregnancies and optimization of antenatal management.