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Plasma Metabolomic Biomarkers in the first trimester of pregnancy can predict the development of Preeclampsia

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Statement of the Problem: Preeclampsia (PE) complicates the course of 2–8% of pregnancies and ranks second in the world among the causes of maternal mortality. Serological markers of PE that meet the clinical requirements for selectivity, accuracy, and reliability are still absent in practice. The aim of this study was to identify predictors of PE based on a comparative mass spectrometric analysis of the metabolite composition of plasma samples from pregnant women with and without PE.

Methodology & Theoretical Orientation: We performed a retrospective comparative analysis of the metabolite profiles in plasma samples of pregnant women aggravated by PE using a direct-injection mass spectrometric method. The study included 79 pregnant women in the first and third trimesters. The patients were divided into 4 groups depending on the presence or absence of PE and the duration of pregnancy: in group I - 25 examined in the first trimester during pregnancy without complications, in II - 3 patients examined in the first trimester, who developed PE in the III trimester, in III - 20 examined in the III trimester during pregnancy without complications, in IV - 31 with PE in the third trimester. For the final analysis, we selected the metabolites that were absent from the “healthy” group but present in the PE group.

Findings: We putatively identified nine endogenous metabolites in the blood samples of pregnant women in the first trimester who subsequently developed PE in the third trimester: 2-(acetylamino)-1,5- anhydro-2-deoxy-4-Ob-D-galactopyranosylD-arabino-Hex-1-enitol, Neuroprotectin D1, Dodecanedioylcarnitine, Estriol-16-Glucuronide, Biotinyl-50 –AMP, N-Acetyl-Dglucosaminyldiphosphodolichol, ADP-glucose, Cer(d18:0/20:0), Allolithocholic acid. The identified metabolites are associated with cytotrophoblast migration, endothelial dysfunction, energy balance in the placenta, and insulin resistance.

Biography

Shalina Raisa Ivanovna - Doctor of Medical Sciences, Professor of the Department of Obstetrics and Gynecology of the Pediatric Faculty of the Russian National Research University named after N.I. Pirogov. Studies are devoted to complications of pregnancy and childbirth, which are the main cause of childhood morbidity and mortality.