Editor's note: *Traditional competitions of scientific works were organized as a part of the Young Scientists School at the XVIII Congress of Pediatricians of Russia, which was held in Moscow on February 13-15, 2015. The finalists were 25 works from 9 cities of the Russian Federation, which were presented by their authors at the electronic poster session on February 14, 2015. The competition commission named the winners which were chosen according to the results of their performance.*

E.I. Malinina (I place)

Tumen State Medical Academy, Tumen, Russian Federation

THE ROLE OF INTRAUTERINE HYPOXIA AND MATRIX METALLOPROTEINAZES 2,9 IN FORMING THE “HYPERECHOGENIC INTERCARDIAL FOCUS”

Relevance. Pathological effects of intrauterine hypoxia, especially in the second and third trimesters of pregnancy, lead to activation of fibrotic processes with the formation of microcalcifications on the papillary muscle and tendon chords, defined prenatally as "echogenic intracardiac focus". The basics factor of the connective tissue remodeling process is the matrix metalloproteinases (MMPs).

Objective: To evaluate the level of matrix MMP-2 and -9 in the cord blood of full-term newborns with the presence of "echogenic intracardiac focus" ultrasound marker (EIF).

Patients and methods. Determination of MMP-2 and MMP-9 concentration in the cord blood of 74 newborns with a "golf ball" by enzyme-linked immunosorbent assay (ELISA) using the R&D Systems Quantikine ELISA and eBioscience Platinum ELISA (USA) MSE test-systems for MMP-2 and -9, respectively.

Results. An increased concentration of MMP-2 and -9 was found in children with prenatally diagnosed EIF as compared to infants in the control group without the studied ultrasound markers. The concentration of MMP-9 in newborns with EIF reached 531,13 ± 43,77 ng/ml, exceeding the control group indicator (241.17 ± 44,52) by 2.2 times ($p < 0.001$), which reflects probably the more significant level of the connective tissue matrix degradation. The level of MMP-9 in the group of infants with prenatally diagnosed EIF correlated with the presence of inflammatory changes in the placenta ($r = 0.439$; $p = 0.024$).

Conclusion. The level of MMP-9 is a monitoring indicator of the placenta formation success, and "echogenic intracardiac focus" is an ultrasonic marker of non-specific hemodynamic violations in the mother-placenta-fetus system.