

Imbalance of IL-10 and IL-13 umbilical cord blood in children born to mothers with asthma

Elena Boytsova¹, Tamara Kosenkova¹, Irina Zazerskaya¹, Valeria Novikova², Natalia Bogdanova², Olga Gurina², Alexander Blinov², Olga Varlamova², Olga Lavrova³

¹ Federal State Budgetary Institution «V.A. Almazov National Medical Research Center» of the Ministry of Health of the Russian Federation, Saint Petersburg, Russian Federation

² Saint Petersburg State Pediatric Medical University, Saint Petersburg, Russian Federation

³ Saint Petersburg First Medical University, Saint Petersburg, Russian Federation

Introduction. Genetic predisposition to atopy persons responding to allergens by the rapid proliferation of Th2 lymphocytes, which secrete cytokines that accelerate the synthesis of IgE antibodies.

Objective. Purpose of the research is to study cytokines rate in umbilical cord blood of children born to mothers suffering severe bronchial asthma (BA).

Methods. Umbilical cord blood samples were taken from 22 full-term babies born to mothers with BA. The comparison group consisted of

66 children born to mothers without allergies. The ratio of boys and girls in the studied groups was the same. The average age of mothers in the groups was the same (31.26 ± 2.32 years and 32.87 ± 2.03 years; $p > 0.05$).

Cytokine's rate (TNF- α , TGF- β 1, IL-18, IL-13, IL-10 and IFN- γ) was quantified by IFA. Statistical processing of data was performed on a personal computer using licensed computer software "Microsoft Excel 2016" and "STATISTICA 12". The student t-test value was determined while analyzing the distribution of quantitative data. The criterion of statistical significance level was $p < 0.05$.

Results. A significant rate decrease of IL-13 was found (6.67 ± 1.6 pg/ml versus 2.0 ± 0.23 pg/ml in the comparison group, respectively, $p < 0.05$) in umbilical cord blood of children born to mothers suffering from BA, which is associated with respiratory allergy. IL-13 rate decrease can be judged as a factor of the long-term intrauterine persistence of the inflammatory process in a child.

In addition, rate increase of IL-10 was found (66.69 ± 14.5 pg/ml versus 25.52 ± 3.1 pg/ml in the comparison group, respectively, $p < 0.05$), which is synthesized by T-and B-lymphocytes, monocytes and macrophages, reduces the activity of the Th-1 immune response more than Th-2.

Conclusion. There is an imbalance of the main anti-inflammatory cytokines: a decrease in IL-13 and an increase in IL-10 in umbilical cord blood of children born to mothers with BA. That can reflect the systemic reaction of body to local damage to organs and can be served as one of the indicators of the intensity and duration of the inflammatory process, as well as disease progression.