

# Umbilical cord blood cytokines TNF $\alpha$ and IFN- $\gamma$ levels increased in children born to mothers who are obese

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**Background.** Maternal obesity is considered one of the several key factors that affect development of the immune system of newborns. Experimental and clinical data indicate an increased risk of developing autoimmune, allergic diseases and obesity in the offspring of obese mothers. The main mechanisms of the relationship between mother's body weight and the immune system of a newborn person remain poorly understood.

**Objective.** Aim of this study was to analyze the cytokine status of umbilical cord blood of children born to mothers with obesity.

**Methods.** Umbilical cord blood samples were taken from 65 children born to thin ( $n = 24$ ), with overweight ( $n = 9$ ) and obese mothers ( $n = 32$ ). The levels of TNF- $\alpha$ , TGF- $\beta$ 1, IL-18, IL-13, IL-10 and IFN- $\gamma$  were 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.** Compared to children born to thin mothers, children born to obese mothers had higher levels of umbilical cord blood plasma TNF- $\alpha$  ( $12,75 \pm 10,80$  pg/ml and  $4,94 \pm 3,55$  pg/ml;  $P_{1,3} = 0,005408$ ) and IFN- $\gamma$  ( $798,90 \pm 565,96$  pg/ml and  $311,05 \pm 249,08$  pg/ml;  $P_{1,3} = 0,014947$ ).

**Conclusion.** These results confirm the hypothesis that maternal obesity affects programming of the immune system of newborns providing a potential connection with an increase in the incidence of chronic inflammatory diseases and obesity in offspring.