

Fetal cytokines in pregnant women following Covid-19 infection

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Objective

To study the main 4 cytokines of the fetal immune system IL-1 β , IL-18, IL-4 and IL-6 in pregnant women who underwent COVID-19 in the third trimester of gestation.

Methods

Studies were conducted in the Republican Perinatal Center for 2022 on 40 fetal cord blood serums taken by transabdominal cordocentesis in pregnant women who underwent COVID-19 in the second trimester of gestation. There were 3 groups. Group I (control) pregnant women with physiological pregnancy and without obstetric and somatic diseases (n=10). Group II- pregnant women who have had COVID-19 in an average form (n=15). Group III- pregnant women who underwent COVID-19 in severe form in the second trimester of their gestation (n=15). Immunological studies of cytokine levels were carried out by enzyme immunoassay using commercial test systems "Human" (Germany).

Results

The content of IL-18, IL-4 and IL-6 in fetuses were significantly increased by 1.5, 1.6 and 2 times, only in pregnant women in group-III, that is, against the background of severe COVID-19 in pregnant women. Whereas in group-II fetuses with an average course of maternal disease, there were no significant changes in these cytokines. The IL-18 and IL-4 indices in the control group were 5.13 ± 1.21 pg/ml and 5.11 ± 1.04 pg/ml, and the IL-6 index was 3.70 ± 1.15 pg/ml. The level of IL-1 β in fetuses against the background of COVID-19 in a pregnant woman with both moderate and severe course was not significantly increased compared to the control group. The IL-1 β index in the control group was 3.53 ± 1.92 pg/ml.

Conclusion

The results of the study of cytokines in the fetus may indicate a strain on the fetal immune system due to antigenic stimulation, which has already passed. Elevated values of IL-4, IL-6, which are cytokines of adaptation to new conditions of existence after birth, contribute to extremely stressful adaptation and are often characterized by the development of many perinatal complications.

CYTOKINES	Medium - heavy current COVID-19 pg/ml	Severe COVID-19 pg/ml	Control data pg/ml
Interleukin -1 β	$24,33 \pm 1,44^*$	$54,61 \pm 2,42^{*\wedge}$	$5,81 \pm 1,47$
Interleukin -18	$42,5 \pm 11,45^*$	$131,5 \pm 22,1^{*\wedge}$	$12,5 \pm 1,83$
Interleukin -4	$13,1 \pm 1,51^*$	$25,1 \pm 2,91^{*\wedge}$	$6,21 \pm 1,33$
Interleukin -6	$12,64 \pm 2,15^*$	$19,4 \pm 1,27^{*\wedge}$	$7,32 \pm 1,39$

Note: * - the reliability of differences with the control group, \wedge - between the studied groups (p <0.05).