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The Levels of Melatonin Decrease and of Pro-Inflammatory Cytokines Increase in Pregnant Women with Placental Insufficiency

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Objective

To establish the correlation between the placental insufficiency and pro-inflammatory part of the immune system by studying of the levels of melatonin and pro-inflammatory cytokines in pregnant women with placental insufficiency.

Materials and methods

46 pregnant women with placental insufficiency were examined. The placental insufficiency manifested as the intrauterine growth restriction syndrome (IUGR) of the II-III degree in pregnancy terms 30-36 weeks. Control group consisted of 20 women with uncomplicated pregnancy in the same term. The kit of reagents Melatonin ELISA, manufactured by IBL, Germany, was used for studying of the blood concentrations of melatonin. Pro-inflammatory cytokines, such as tumor necrotizing factor-α (TNF-α), interleukin-1-β (IL-1-β), interleukin-6 (IL-6) were determined in the blood using reagents manufactured by "Вектор-Бест" (Ukraine).

Results

It has been established that concentration of melatonin significantly decreases, if the pregnancy is complicated by intrauterine fetal growth retardation (study group – 126,87±14,87 pg/ml, control group – 231,25±21,56 pg/ml, $p<0,001$). The levels of pro-inflammatory cytokines in the study group were significantly higher, comparing with the control group (TNF-α: study group – 10,05±1,35 pg/ml, control group – 5,60±1,50 pg/ml, $p<0,05$; IL-1-β: study group – 14,67±2,13 pg/ml, control group – 3,96±0,92 pg/ml, $p<0,001$; IL-6: study group – 6,91±0,99 pg/ml, control group – 2,69±0,99 pg/ml, $p<0,05$).

Conclusions

The blood level of melatonin significantly decreases in case of placental insufficiency, manifested as intrauterine fetal growth restriction. The strengthening of the pro-inflammatory immunity, shown as the increasing of the levels of TNF-α, IL-1-β and IL-6, is also present in case of IUGR.

Keywords: Melatonin, Placenta, Cytokines, Intrauterine Fetal Growth Restriction.