Maternal cytokines and biochemical markers as indicators of moderate and severe preeclampsia

Author: Ana Daneva Markova

Co-authors: Hadzi Lega M, Dzikova E, Bina A, Kjaev I, Girevski V, Sterjovska A

Introduction Preeclampsia is considered as a failure of body's adaptive mechanisms. Maternal immune system is involved in maternal endothelial dysfunction and the subsequent systemic reaction seen in preeclampsia. Further arguments to support the idea of the involvement of the maternal immune system in the development of preeclampsia come from the primipaternity theory. This hypothesis holds that the risk of developing preeclampsia is highest in the first pregnancy, and a previous normal pregnancy is associated with a lowered incidence of preeclampsia in the subsequent pregnancy. Studying production of pro-inflammatory (IL-1β, IL-8), anti-inflammatory (IL-10), CRP and TNF alpha in moderate and severe preeclampsia in third trimester of pregnancy.

Patients and methods 50 women with pregnancies complicated by preeclampsia were evaluated in the third trimester of pregnancy and 50 women with normotensive pregnancy. Levels of IL-1β, IL-8, IL-10, and TNF alpha were measured by using a solid-phase enzyme immunoassay. Statistical data processing was done using the application program SPSS for Windows 13, 0. To describe the distribution of analyzed variables descriptive methods were used (mean, median, minim and max).

Results IL-10 in severe preeclampsia has a downward trend, IL-8 is a relatively stable parameter, and CRP (C-reactive protein) levels tend to be higher in women at the risk of developing preeclampsia. Increasing levels of TNF-alpha, IL-1β between 28-40 weeks of gestation may be considered a prognostic marker for the development of preeclampsia.

Conclusion In connection of the changes that the anti-inflammatory cytokine concentrations in severe preeclampsia caused in the opposite direction, moderate phase can be considered a critical stage in the complicated pregnancy that comes to most functional strain homeostatic system. It can be assumed that the effect of moderately aggressive factors is the role of initiators of synthesis of mediators of intercellular interaction (with moderate preeclampsia), so the development of the immune response is regulated by the interaction of cytokines and their antagonists. With increasing severity of the pathological process, the impact of regulatory factors that limit the systemic effect is reduced, thus causing increased creation of cytokines that are activated immunocytes. At a certain stage of this process, spending of functional reserves of mononuclear cells occurs, resulting in a state of decompensation, characterized by "leukocyte depression" in which the synthesis of immunoregulatory factors reduces significantly.
In conclusion cytokines play critical, essential roles in signaling between cells of the immune system, with a prolific range of regulatory activities including the recruitment, activation, stimulation, killing, and suppression of immune and non-immune cells.