

Abstract

Heat shock proteins increase their gene expression after exposure of cells or organisms to some forms of stress, which may be high temperature, infection, inflammation, hypoxia, lack of nutrients and water. Stressful situations for the body are also pregnancy-related complications associated with placental insufficiency - preeclampsia and IUGR, as well as other pregnancy-related complications such as fetal growth restriction and gestational hypertension. Therefore, I examined whether the occurrence of pregnancy-related complications (preeclampsia, fetal growth retardation, gestational hypertension) affect the gene expression of heat shock proteins.

Five hsp systems was detected, namely Hsp27, Hsp60, Hsp70, Hsp90 and HspBP1 in placental tissue samples and whole maternal peripheral blood. Samples came from women with physiological pregnancy and from women with certain pregnancy-related complications (PE, FGR, GH). RNA was isolated from the samples. Detection of hsp expression was performed by using real-time RT-PCR and the comparative Ct method. Changes in gene expression between the test samples and reference sample were examined. To assess the difference between physiological pregnancies and pregnancies with selected pregnancy-related complications, an analysis of variance (ANOVA) was used. Results of the study showed a significantly increased expression of Hsp27 and Hsp90 in placental tissue derived from women suffering preeclampsia with or without FGR. Increased expression HspBP1 in the group of women with mild preeclampsia compared with women with severe preeclampsia and a weak negative correlation between HspBP1 gene expression and pulsatility index in the umbilical artery were also observed. Then up-regulation of Hsp60 in group PE+/-FGR was identified while up-regulation of Hsp70 and Hsp90 down-regulation in all treatment groups in the whole peripheral blood samples, as a manifestation of maternal systemic response to the pregnancy-related disorder. Increased expression of Hsp60 in patients with oligo/anhydramnion compared with women with normal amniotic fluid volume and a weak negative correlation between the expression of Hsp27 and HspBP1 and pulsatility index in the middle cerebral artery were also observed.