

Cytoprotective role of black tea in modulating the stress associated proteins in preeclamptic placental explants

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ABSTRACT

Oxygen plays a central role in human placental pathogenesis including preeclampsia, a leading cause of materno-fetal morbidity and mortality. Insufficient uteroplacental oxygenation in preeclampsia is believed to be responsible for molecular events leading to clinical manifestations of this disease. Hypoxia-inducible factor 1- α (HIF-1 α) is a key transcription factor that plays a vital role in mediating cellular and systemic responses during hypoxia. It acts as a master transcriptional regulator and activates the transcription of stress protein genes whose protein products facilitate metabolic adaptation to hypoxia. This may trigger different intracellular signaling molecules like heat shock proteins for successful progression of pregnancy and live fetal delivery during preeclamptic stress. Modulations in its regulatory mechanisms affect the maintenance of uterine quiescence during pregnancy and activation of contractile proteins leading to preterm labor. Black tea plays a vital role in reducing oxidative damage in preeclamptic placenta. The present study is first attempt to analyze the modulatory effect of black tea on signaling molecules expression like HIF-1 α , HSP70 and HO-1 in placental explant during preeclampsia. 20 cultured placental explants from normotensive and preeclamptic patients were used for this study. Differential expression of HIF-1 α , HSP70 and HO-1 were analyzed by enzyme-linked immunosorbent assay (ELISA). The study observed that black tea incubations significantly decreased HIF-1 α , HSP70 and significantly increased HO-1 expressions in preeclamptic placental explants. The study highlights the potential therapeutic value of black tea during preeclamptic stress.