The relation between pregnancy and stress in rats: considering corticosterone level, hippocampal caspase-3 and MAPK activation.

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Abstract

OBJECTIVES: There are some evidences indicating that stress can affect hippocampal survival and function. During pregnancy mother is exposed to more stress and anxiety; also adrenal gland response to ACTH and glucocorticoid secretion is increased. Hence this study was done to assess the effect of restraint stress on corticosterone level, hippocampal caspase-3 and MAPK activation during pregnancy.

STUDY DESIGN: The restraint stress was applied in day 14 or days 14-20 (single and repeated stress) of rats' pregnancy. The hippocampi were isolated after last stress episode and western blot analysis was done to assess caspase-3 and MAPK activation. Data were analyzed by one-way ANOVA followed by Student-Newman-Keuls for multiple comparison.

RESULTS: Our study showed that single and repeated stress both increase corticosterone level compared to non-stressed pregnant rats, but do not induce hippocampal apoptosis. Single stress increases transient JNK activation but not P38 and ERK. Repeated stress activated none of the MAPKs.

CONCLUSION: It seems that pregnancy protects mother's hippocampus against stress-induced damages.