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Poster Presentation

The Effect of Maternal Stress on the Hippocampal Neural Death in the Newborns Rats

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Abstract

Early life stress during fetal development has been hypothesized to predispose several neurological and psychiatric disorders in adulthood. The purpose of this study was to investigate the effect of maternal stress on the volume of granular cells, total number of dark neurons and also the distribution of glycol-conjugates and changes of terminal sugars in the dentate gyrus. Pregnant Sprague-Dawley rats were divided into stress and control groups. Stress was applied on the pregnant females from day 15 until delivery. Pregnant rats were acutely stressed for 45 minutes three times daily with noise and light. Postpartum neonates were collected and weighted. The brain of neonates was removed and inserted in the paraformaldehyde 4%. The paraffin embedded horizontal sections with 5 micron thickness were prepared serially. The volume of granular cells and the number of dark neuron in the dentate gyrus was calculated by stereological method. The distribution of glycol-conjugates also was analyzed immunohistochemically. The results of this study showed that the mean volume of granular cells in stress group decreased significantly compared to with the control group ($p < 0.05$),while the mean numerical density of dark neurons in stress group increased significantly compared to the control group ($p<0.05$). Maternal stress led to reduced birth weight in experimental group of neonates. These changes were associated with increased pituitary-adrenal activity in mothers reflected by higher ACTH level and also hypertrophy of adrenal glands in the stress rats. The intensity of hippocampal reaction with lectins in the stress group was more than control groups. Our findings suggested the potential role of maternal stress on the neural damaged result in memory deficits in newborns rats.

Keywords: Stress, Rats, Memory

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