

Original Paper

Effect of chronic stress and intra-amygdal memantine administration on alterations of brain's volume and weight to volume and weight ratio of the adrenal gland in male mice

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Abstract

Background and Objective: After chronic stress, brain volume and weight reduces and in turn, adrenal weight and volume increases. This study was performed to determine the effect of chronic stress and memantine administration within amygdala on the alterations of brain's volume and weight ratio to volume and weight of the adrenal gland on male mice.

Methods: In this experimental study, bi- or unilateral amygdala cannulation was performed stereotaxically. A week after recovery, animals were received different doses of memantine (1, 0.5, and 0.1 µg/mouse), five min before stress induction. Electric foot shock induced to animals for seven consecutive days. At the end of the seventh day, animals were sacrificed and their brain and adrenal glands were fixed in formalin 4%. The volume and weight was determined by mercury immersion and accurate balance respectively.

Results: Stress non- significantly reduced brain's volume ratio to volume of the adrenal gland and brain's weight ratio to weight of the adrenal gland. Memantine administration within amygdala inhibited stress effect. Memantine administration in low and medium doses within right and left amygdala significantly increased brain's volume and weight ratio to volume and weight of the adrenal gland ($P<0.05$).

Conclusion: Memantine dose and side dependently inhibits the effect of induced stress in male mice. Also, unilateral memantine administration within the left and right amygdala was more effective.

Keywords: Adrenal Gland, Brain, Amygdala, Memantine, Volume, Weight

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