

Original Paper

Effect of 3-4,methylenedioxymethamphetamine in CA1 hippocampal neurons in male Rats

Soleimani Asl S (PhD)¹, Shekarriz N², Molavi N², Basirat A², Falahati P²
Esmaeili F², Azimi Z², Sajadi F², Mehdizadeh M (PhD)*³

¹Assistant Professor, Department of Anatomy, Research Center for Behavioral Disorders and Substance Abuse, Hamadan University of Medical Sciences, Hamadan, Iran. ²Medicine Student, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran. ³Professore, Cellular and Molecular Research Center, Department of Anatomy, Tehran University of Medical Sciences, Tehran, Iran.

Abstract

Background and Objective: Considering the role of the hippocampus in memory, this study was done to evaluate the effect of 3-4,methylenedioxymethamphetamine on CA1 hippocampal neurons in male rats.

Materials and Methods: In this experimental study 18 sprague dawley male rats (200-250g) were randomly allocated into three groups as follow: control (intact), control sham and experimental groups. Sham and experimental groups were received normal saline (1 cc) and MDMA10mg/kg IP for 7 days, respectively. Following transcardial perfusion by paraformaldehyd 4%, structure and ultrastructure of right CA1 hippocampus were assessed by crysel violet staining and electronic microscope. Data were analyzed using SPSS-16, ANOVA and Tukey tests.

Results: There was no significant difference between control (mean=210±40.38) and sham groups (mean=199±38.7) in neuron density. Neuron number decreased significantly in experimental group (mean=98±25.4) in compare to control and sham groups (P<0.001). There was no ultrastructural abnormality in control and sham groups. Finally, ultrastructural changes with apoptosis characterized by mitochondrial cristae reduction, distribution of nuclear chromatin and loss of cytoplasmic organelles in MDMA groups.

Conclusion: This study shows that MDMA administration can stimulate the cell death with apoptotic pattern in hippocampus.

Keywords: 3,4-methylenedioxyamphetamine, Neuron, Cell Death, Hippocampus, Rat

* **Corresponding Author:** Mehdizadeh M (PhD), E-mail: mehdizadehm@tums.ac.ir

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