Mephedrone Exposure in Pregnancy Induces Antiprolifervative and Proapoptotic Effects in Hippocampus of Mice Delivered Pups

Gholamreza Naseri1*, Alireza Fazel1, Mohammad Jafar Golalipour2, Hossein Haghiri1, Hamid Sadeghian1, Majid Mojarrad3,4, Mahmoud Hosseini6, Shokouh Shahrokhi Sabzevar7, Farimah Beheshti8, Ahmad Ghorbani9

1Department of Anatomy and Cellular Biology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
2Gorgan Congenital Malformations Research Center, Golestan University of Medical Sciences, Gorgan, Iran
3Department of Laboratory Sciences, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran
4Medical Genetics Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
5Department of Medical Genetics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
6Division of Neurocognitive Sciences, Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
7Department of Basic Science and Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran
8Pharmacological Research Center of Medicinal Plants, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

In recent years, abuse of synthetic cathinones, in particular, mephedrone, has increased among young adults worldwide. The study aim is to investigate the effects of mephedrone exposure during the gestational period on mice offspring outcomes, focusing on hippocampal neurotoxicity. The pregnant mice received mephedrone (50mg/kg, sc) on a regular schedule (once daily on all days, from day 5 to 18 of gestation) or repeated schedule (thrice daily on day 5, 6, 11, 12, 17, and 18 of gestation) to simulate regular or recreational use of mephedrone, respectively. Immunohistochemistry and TUNEL assay showed an inhibition of cell proliferation (p<0.05) and an increase of apoptosis (p<0.05) in the hippocampus of delivered pups of the repeated schedule mephedrone group. In conclusion, the present study has shown that repeated use of mephedrone impairs learning and memory processes through hippocampal damage.

Keywords: Hippocampus, Mice, Memory

*Corresponding Author: Gholamreza Naseri
Email: g_naseri@yahoo.com

Published: 17 April, 2018