Mephedrone Exposure in Pregnancy Induces Anti-proliferative and Pro-apoptotic Effects in Hippocampus of Mice Delivered Pups

Gholamreza Naseri¹*, Alireza Fazel¹, Mohammad Jafar Golalipour², Hossein Haghiri¹, Hamid Sadeghian³, Majid Mojarrad⁴, 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