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3,4-methylenedioxymethamphetamine-induced neurotoxicity improves following exercise in the hippocampus of adult rats**Sara Soleimani Asl Koolani^{1,2}, Alireza Gharebaghi³, Iraj Amiri², Iraj Salehi³, Siamak Shahidi³ and Alireza Komaki³**
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3,4-methylenedioxymethamphetamine (MDMA) or ecstasy impairs the learning and memory. As the exercise can improve the memory, herein we investigated the effects of treadmill exercise on memory and long term potentiation in relation to apoptosis, neurotrophic factors and stress oxidative in the hippocampus of MDMA-treated rats. Male Wistar rats received multiple injections of MDMA and exercised for one month on a treadmill. Long Term Potentiation (LTP) and memory function were assessed using electrophysiology and Morris water maze. Lipid peroxidation and expression of caspase 3 and Brain Derived Neurotrophic Factor (BDNF) were examined by thiobarbituric acid assay test and western blot, respectively. Treadmill exercise could improve MDMA-induced LTP disruption and memory impairment. Caspase 3 expression decreased in the exercise group compared to MDMA group. BDNF expression decreased in MDMA group and treadmill exercise could increase that. Exercise caused the reduction in lipid peroxidation in the hippocampus. Exercise seems could be a useful strategy for treating memory impairment through up-regulation of BDNF and decrease in apoptosis in the hippocampus.

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