EFFECT OF KYNURENINE ANALOGS IN MICE BEHAVIORAL TESTS

D. Martos[1], A. Nyári[1], V. Markó[1], B. Tuka[2], J. Tajti[1], L. Vécsei[1,2]
[1]*Department of Neurology, University of Szeged, Hungary*
[2]*MTA-SZTE, Neuroscience Research Group, Hungary*
martos.diana87@gmail.com

Endogenous kynurenines have important role in the pathogenesis of dementia associated neurodegenerative diseases. The neuroprotective kynurenic acid (KYNA) effectively inhibits the glutamate neurotoxicity, however in high doses it can impair the cholinergic system. Nevertheless, the administration of KYNA in small doses may facilitate the learning/memory processes, as a partial agonist of glutamate receptors. Our aim was to examine the dose-effects of KYNA and its analogues (KYNA1, KYNA2, and KYNA3), which may have abilities to affect the cognitive functions, without harmful side effects.

KYNA or its analogues or saline (2 µl) was injected in 0.01, 0.05 and 0.1 µM concentrations into the right lateral ventricle of C57BL6 mice. We observed their behavioural changes (ataxia, stereotype), the exploratory/spontaneous locomotor activity, the motor coordination and learning ability in open field (OF) and rotarod (RR) tests.

All concentrations of KYNA increased the stereotyped behaviour and/or the ataxic condition of the mice, but only the 0.1 µM KYNA reduced their OF activity compared to the control group. However, the RR performance of the animals significantly improved 60 min after the 0.1 µM KYNA treatment. The equimolar KYNA1, KYNA2 and KYNA3 have provoked less stereotypic/ataxic movements. The KYNA1-treated mice moved significantly less in the OF test, but 15 and 120 minutes after the injection their RR results appreciably ameliorated.

Our results demonstrate that the KYNA and its analogues in high concentrations may cause side effects, while their application in low concentrations completed with motor training session may play a role in the stimulation of learning processes.