

Title: Chronic Toluene Exposure, Hippocampus-dependent Spacial Memory and Hippocampal Structure. Experimental Study

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Toluene and toluene-containing volatile substances are the most commonly abused solvents with a demonstrative addictive potential in humans. The central nervous system is one of the main targets: chronic toluene exposure is associated with long-lasting neurological, behavioral, neurochemical, and structural impairments.
In the present study, we evaluate immediate and persisting effect of chronic toluene exposure on spatial memory and hippocampal structure in adult male Wistar rats. Each animal separately was exposed to toluene vapor (2000 ppm) or clean air for 3-5 min/d, during 20 d. Immediate effect of toluene chronic exposure was evaluated immediately after the end ofchronic inhalation, while persisting effect – 90 days after the end of toluene exposure. Impairment in spatial long-term memory was assessed using escape latency and Morris water maze test 24 h after training. Behavior in Water Maze comprise the acquisition and spatial localization of relevant visual cues that are subsequently processed, consolidated, retained and finally retrieved in order to successfully navigate and thereby to escape water. The hippocampus is a key structure for place learning, and the water maze procedures have been considered as a hippocampus-dependent. Therefore in parallel with behavioral studies, quantitaitve analysis of cell loss was performed in all layers of hippocampal CA1 and CA3 areas. The results revealed that in toluene-treated animals the long-term spacial memory in rats is worsened. Moreover, in both hippocampal areas significant loss of cells was observed in pyramidal cell layers. Such data are one more evidence of the role of hippocampus in toluene addiction.

Biography

Nino Pochkhidze is a Master of Science in Neuroscience. She is PhD student at Ilia State University, Tbilisi, Georgia (Specialty: Molecular Neuroscience). In her PhD research, Nino Pochkhidze, using different behavioral tests and several approaches of classical histology, electron microscopy and atomic force microscopy, investigates behavioral, structural, ultrastructural and nanoscale modifications provoked by chronic toluene exposure in adult and adolescent rats. She has three personal scientific grants and participates in several projects fundied by Shota Rustaveli National Sciwnce Foundation. Nino Pochkidze is an author of 6 scientific articles and presenter at 20 internataional and national scientific symposiums and conferences.

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