

The connection of changed cholinergic receptors with the deficit of learning and memory of rats with chronic fluorosis

Zhi-Zhong Guan, Yang-Ting Dong, Yan-Jie Liu, Chuan-Zhi Gui, Qin Gao and Na Wei
Guizhou Medical University, China

In order to reveal the mechanism of decreased learning ability and memory induced by chronic fluorosis, nicotinic acetylcholine receptors (nAChRs) and muscarinic acetylcholine receptors (mAChRs), cholinesterase (ChE) activity and oxidative stress were investigated using rats with chronic fluorosis. Spatial learning and memory of the rats were evaluated by Morris Water Maze test. The expressions of nAChRs and mAChRs at protein and mRNA levels were detected by Western blotting and real-time PCR, respectively. ChE activity and the level of oxidative stress were determined by chemical colorimetry. The results showed that the learning and memory capacity in rats with chronic fluorosis was decreased. In the brain tissues from the rats with fluorosis as compared to controls, the protein expressions of nAChR and mAChR subunits were lower, and the corresponding mRNAs of these receptor subunits

changed; the activities of acetylcholinesterase (AChE) were reduced, but no change of butyrylcholinesterase (BuChE); the increased MDA content and the decreased activities of SOD and GSH-px were found. The results indicated that the deficit of learning and memory of the rats with chronic fluorosis may be in mechanism correlated with the inhibited expression of cholinergic system and the increased level of oxidative stress.

Speaker Biography

Zhi-Zhong Guan completed his PhD from Karolinska Institutet, Sweden in 1997. He is the Director of the Key Lab of the Endemic and Ethnic Diseases in Education Ministry of China. He has published more than 400 papers (including more than 100 SCI collected papers) in peer-reviewed journals and has been serving as an Editorial Board Member or reviewer of several journals.

e: 1457658298@qq.com

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