

عنوان مقاله:

Differential change in cortical and hippocampal monoamines, and behavioral patterns in streptozotocin-induced type 1 diabetes rats

محل انتشار:

مجله علوم پایه پزشکی ایران، دوره 21، شماره 10 (سال: 1397)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Li-Wei Lin - School of Chinese Medicines for Post-Baccal aureate, I-Shou University, Kaohsiung 82445, Taiwan

Fan-Shiu Tsai - School of Chinese Medicines for Post-Baccal aureate, I-Shou University, Kaohsiung 82445, Taiwan

Wen-Ta Yang - Taichung Hospital, Ministry of Health and Welfare, Taichung 404, Taiwan

Shang-Chih Lai - School of Post-Baccalaureate Chinese Medicine, Tzu Chi University, Hualien 97071, Taiwan

Chun-Chuan Shih - School of Chinese Medicines for Post-Baccal aureate, I-Shou University, Kaohsiung 82445, Taiwan

Sheng-Chi Lee - Pintung Branch, Kaohsiung Veterans General Hospital, Pintung 91245, Taiwan

Chi-Rei Wu - Department of Chinese Pharmaceutical Sciences and Chinese Medicine Resources, College of Pharmacy, China Medical University, Taichung 404, Taiwan

خلاصه مقاله:

Objective(s): Diabetes mellitus (DM) is a widespread metabolic disorder worldwide. Clinical physicians have found diabetic patients have mild to middle cognitive dysfunction and an alteration of brain monoaminergic function. This study explored the change in various patterns of behavioral models and brain monoamine function under streptozotocin (STZ)-induced type 1 diabetes. Materials and Methods: We established a type 1 DM model via intravenous injection with STZ (65 mg/kg) in rats. Three weeks after the STZ injection, various behavioral measurements including the inhibitory avoidance test, active avoidance test and Morris water maze were conducted. Finally, all rats were dissected and the concentrations of monoamines and their metabolites in cortex and hippocampus were measured by high performance liquid chromatography with electrochemical detection. Results: We found that STZ induced type 1 diabetes (hyperglycemia and lack of insulin) in rats. STZ-induced diabetic rats had cognitive impairment in acquisition sessions and long-term retention of the active avoidance test. STZ-induced diabetic rats also had cognitive impairment in spatial learning, reference and working memory of the Morris water maze. STZ significantly reduced concentrations of norepinephrine (NE) in the cortex and dopamine (DA) in the hippocampus, but increased concentrations of DA and serotonin (5-HT) in the cortex 35 days after injection. The concentration of 5-HT in the hippocampus was also significantly increased. Conclusion: The data suggested that this cognitive impairment after a short-term period of STZ injection might be related to cortical NE dysfunction, differential alteration of cortical and hippocampal DA function, and brain 5-HT hyperfunction.

کلمات کلیدی:

Biogenic amines, Cerebral cortex, Hippocampus, Memory and learning tests, Mice, Oral glucose tolerance test, Type ۱ Diabetes Mellitus

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1295215>

