

Original Paper

Effect of palmatine hydrochloride on cognitive dysfunction in streptozotocin-induced diabetic Rats

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Abstract

Background and Objective: Recent studies have shown that diabetes induced cognitive dysfunction and impairs learning and memory. Palmatine is an isoquinoline alkaloid, and has multiple pharmacological effects, including anti-diabetic and antioxidant activity. This study was conducted, to evaluate the effect of Palmatine on learning and spatial memory impairment in STZ-induced diabetic rats.

Materials and Methods: This experimental study was conducted on the male Wistar rats (n=32) with approximate weight of 240±40 grams. The rats were randomly allocated and were divided into 4 groups (n=8): Control, Palmatine-treated non-diabetic, diabetic and Palmatine-treated diabetic groups. Diabetes was induced by STZ administration at the dose of 55 mg/kg through intraperitoneal route. Palmatine hydrochloride was administered subcutaneous at doses of 10 mg/kg/day 1 week after STZ injection for a period of 6 weeks. Blood samples were taken from the tail vein 1, 3, 5, 7 weeks after STZ injection to measure blood glucose levels. Behavioral tests including spatial recognition and objective recognition were performed at the end of study. Data were analyzed by using Prism-5, one way ANOVA and Tukey tests.

Results: In spatial recognition test, the number of entrance in new arm of the Ymaze, in the Palmatine-treated groups significantly increased in compare to diabetic group in both sixth and seventh weeks (P<0.05). Number of rearing in new arm significantly increased in sixth and seventh weeks, compare to the diabetic group (P<0.05). The number of recognition novel objects in the Palmatine-treated diabetic group significantly increased in compare to diabetic group (P<0.05).

Conclusion: Palmatine hydrochloride administration for 6 weeks improves cognitive dysfunction in streptozotocin-induced diabetic rats.

Keywords: Diabetes mellitus, Palmatine hydrochloride, Cognitive dysfunctions, Memory, Learning

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