

Original Paper

Protective effect of silymarin on learning and memory deficiency in streptozotocin-diabetic Rats

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Abstract

Background and Objective: Diabetes mellitus cause learning, memory and cognitive skills disorders in the long term. This study was conducted to determine the protective effect of silymarin on the learning and memory deficiency in streptozotocin-diabetic rats.

Materials and Methods: This experimental study was conducted on 40 male Wistar rats weighing 240-300 grams. The rats were randomly allocated into 5 groups: control, silymarin -treated control (100 mg/kg), diabetic, and two silymarin -treated diabetic groups (50 and 100 mg/kg). Silymarin was daily administered (i.p. and daily) ten days after streptozotocin injection for 4 weeks. Finally, initial (acquisition index) and step-through latencies (retention and recall index) were measured using passive avoidance test and alternation behavior percentage as an index of spatial memory was determined using Y maze. The level of malondialdehyde in the homogenate hippocampal tissue of the animals brains was measured. Data were analyzed using Sigma Stat-3.5, one-way and two-way ANOVA, Tukey, and Kruskal-Wallis tests.

Results: A significant reduction of STL was observed in diabetic ($P<0.01$) and silymarin-treated (50mg/kg) diabetic ($P<0.05$) groups and this parameter was significantly higher in diabetic group receiving a high dose of silymarin compared to diabetic group ($P<0.05$). Meanwhile, alternation percentage in diabetic animals was significantly lower than control group ($P<0.05$) and this index did not show a significant difference in silymarin-treated diabetic groups in comparison with diabetic group. In diabetic rats, there was a significant increase in the tissue level of malondialdehyde ($P<0.05$) and silymarin treatment with dosage of (100 mg/kg) significantly reduced the level of MDA ($P<0.05$).

Conclusion: This study showed that although long-term administration of silymarin at a high dose (100 mg/kg) affects the ability to store data in memory and to recall it in diabetic animals in passive avoidance test, it does not improve short-term spatial memory in diabetic animals. The beneficial effects of silymarin may be via attenuation of lipid peroxidation in hippocampus tissue.

Keywords: Silymarin, Learning, Memory, Diabetes Mellitus, Streptozotocin, Lipid peroxidation

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