



Effects of different doses of zinc chloride on passive avoidance learning and memory in streptozotocin-induced diabetic adult male rats

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Abstract

Introduction: Zinc is an essential rare element that plays an important role in synaptic plasticity and modulation of the activity of central nervous system and is involved in learning and memory. Increasing zinc intake may protect against conditions associated with zinc deficiency, such as diabetes. Some studies have revealed that zinc deficiency in diabetic subjects is due to higher excretion or lower absorption of zinc in these subjects. Therefore, in this study, effects of various doses of zinc chloride on passive avoidance task was investigated in adult male Wistar rats without zinc deficiency.

Methods: Male Wistar rats (200±20g) with streptozotocin-induced diabetes were used in this study. Rats were randomly divided into the groups that received ZnCl₂ (30,50,70,100 mg/kg/day) or the same volume of water (diabetic healthy control group) by oral gavage for two weeks. Each rat was then tested by Step-Down device once daily for 4 days. Memory, which was measured by the time that a rat stays on the stone bench, was measured 24h after the last trial (5th day).

Results: The results showed that the use of ZnCl₂ (30, 50, 70,100 mg/kg) for 2 weeks did not significantly affect passive avoidance learning and memory.

Conclusion: These results indicate that ZnCl₂ with doses that were administered in this study, does not remarkably affect learning and memory process. This is probably because streptozotocin-induced diabetic rats have zinc deficiency and they require higher doses of zinc supplementation for compensation of zinc loss due to hyperzincuria.

Key words: Zinc, Diabetes, Memory, Rat

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