Histological study on the protective role of vitamin B complex on the cerebellum of diabetic rat

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Abstract:

Background: Disorder in cerebellar structure was reported in diabetes mellitus. B vitamins are involved in many significant metabolic processes within the brain. Aim of the work: To detect the protective role of vitamin B complex on the histological structure of the cerebellum of experimentally induced diabetic rat. Material & methods: Eighteen adult male Wistar rats were divided into two groups. Group I: normal vehicle control (n = 6). Group II: streptozotocin-induced diabetic rats (n = 12), which was equally divided into two subgroups; IIA (diabetic vehicle control), IIB (diabetic vitamin B complex-treated); streptozotocin-induced diabetic rats treated with vitamin B complex (1 mg/kg/day) for 6 weeks. Specimens from the cerebellum were processed for light and electron microscopy. Results: In vitamin B complex treated group, the histological changes in Purkinje cells, astrocytes and oligodendrocytes were improved compared with the diabetic non-treated group. The white matter revealed intact myelinated axons. Inducible nitric oxide synthase (iNOS) and caspase-3 expression reduced. Glial fibrillary acidic protein (GFAP) expression revealed less activated astroglia. The number of Purkinje cells/mm² significantly increased. While, the number of GFAP positive astrocytes/mm² significantly decreased. In addition, the blood glucose level was reduced. Conclusion: Vitamin B complex protected the cerebellum from the histological changes which occurred in STZ-induced diabetic rats.

Keywords:

Diabetic encephalopathy, Vitamin B complex, Gliosis

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