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ABSTRACT

Ethnopharmacological relevance: In-vitro cultured calculus bovis (ICCB) is a quality substitute for natural bezoar which is used for the therapeutic purpose of treating encephalopathy. ICCB has been authorized to use on clinic. The aim of the study is to evaluate the effects and the potential mechanisms of in-vitro cultured calculus bovis (ICCB) on learning and memory impairments of hyperlipemia vascular dementia (HVD) rats.

Materials and methods: The HVD model was established by permanent occlusion of bilateral common carotid arteries based on hyperlipemia rats. Learning and memory abilities were evaluated by morris water maze test and shuttle box test. Ultraviolet-visible spectrophotometry (UV-Vis) was employed to determine the SOD, MDA and NO in cerebral tissue, as well as the TG in serum. HE staining and toluidine blue staining were employed to evaluate cone cells damage in hippocampus CA1. An immunohistochemistry was used to measure the Bax and Bcl-2 expressions in cerebral tissue.

Results: Compared with control group, the abilities of spatial learning and memory and conditional memory were decreased significantly in HVD group (P<0.01, P<0.05). MDA content in cerebral tissue was remarkably increased while the SOD activity and NO content were both decreased (P<0.01). TG content in serum was increased remarkably (P<0.01). And the cone cells in hippocampus CA1 were damaged obviously. Compared with HVD group, ICCB treatment improved the abilities of learning and memory, elevated the SOD activity (P<0.01, P<0.05), reduced the MDA content (P<0.01) as well as the TG content in serum (P<0.01), increased the NO content (P<0.01), improved the damaged cone cells in hippocampus CA1, increased the number of cones cells (P<0.01), decreased the Bax expression, and increased the Bcl-2 expression (P<0.01).

Conclusion: ICCB could improve the abilities of learning and memory in HVD rats. It might be related to anti-oxidative, regulation of Bax and Bcl-2 expressions, and the alleviation of cone cells

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