Abstract

The protective effect of hesperetin and nano-hesperetin on object recognition memory in animal model of Alzheimer disease

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Background and objectives: Hesperetin (Hst), aglycone form of hesperidin, is reported to have antioxidant, anti-inflammatory and neuroprotective activities. On the other hand, the latest nanoparticle technology can help to improve the bioavailability of Hst, which is affected by the final particle size and stability. Alzheimer's disease is a neurodegenerative disease, characterized by loss of the cognitive abilities, including memory, speech, emotions, and personality. Oxidative stress, a condition that occurs due to the imbalance in oxidant and antioxidant status, has been known to play a vital role in the pathophysiology of neurodegenerative diseases. This study was carried out in order to evaluate the protective effects of hesperetin and nano-hesperetin on memory disorder in the brains of Alzheimer's animal models. **Methods:** Forty nine male rats were divided into 7 groups: control, vehicle, STZ group (rats were injected with STZ), treatment groups receiving 10 and 20 mg/kg/day of hesperetin and nano-hesperetin. Then 3 μgr/rat of (STZ) was injected to the cerebroventricular of rats of all groups except the control and vehicle groups. The 4 treatment groups were gavaged by, respectively 10, 20 mg/Kg of hesperetin and nano-hesperetin for 30 days. After three weeks, recognition memory was examined by novel object recognition test. **Results:** The results showed that injection of STZ increased memory disorders ($p \leq 0.001$) and treatment of hesperetin and nano-hesperetin effectively decreased memory disorders ($p < 0.01$, $p < 0.001$) and increased discrimination index compared with STZ group. **Conclusion:** Hesperetin and nano-hesperetin showed protective effects against memory impairments and protected cholinergic neurons in the hippocampus, possibly through reducing the oxidative stress.

Keywords: alzheimer, hesperetin, nano-hesperetin, recognition memory

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