

Evaluation of the effects of Quercetin on passive avoidance memory in an Alzheimer's-like model of stressed rats (role of inflammatory and oxidative factors on the expression of Alzheimer's related genes)

Abstract

Background: Alzheimer's is a progressive neurological disease and is considered one of the main causes of dementia worldwide. Chronic stress as an important environmental risk factor for Alzheimer's causes changes in brain structures, especially the hippocampus, which plays a key role in cognitive functions, through the increase of inflammatory factors and oxidative stress factors. Quercetin is one of the most abundant flavonoids in vegetables and fruits. In recent studies, it has been shown that quercetin has been effective in improving cognitive dysfunction caused by chronic stress and oxidative stress and improving memory and cognition in Alzheimer's models.

Aim: The present study aims to investigate the effects of quercetin on cognitive dysfunction, changes in oxidative stress factors, inflammatory factors and the expression of genes involved in Alzheimer's pathogenesis in Alzheimer's-like mouse models.

Materials and Methods: 8 groups of rats were studied in two groups, non-stressed and stressed. rats were pretreated orally with quercetin (20 mg/kg/day) for 30 consecutive days and treated with scopolamine (1 mg/kg) intraperitoneally from days 21 to 30 to induce Alzheimer's disease. To induce chronic stress, the rats were placed inside the restraint for two hours daily from day 1 to day 10. After performing the passive avoidance memory test, the rats were euthanized and the hippocampus and prefrontal cortex were removed to evaluate inflammatory factors, oxidative stress and gene expression.

Results: The results of this study showed that pretreatment with quercetin improved the cognitive impairment caused by scopolamine and chronic stress. Pretreatment with quercetin inhibits oxidative stress in the brain and prevents APP protein from entering the amyloidogenic pathway that leads to the formation of beta amyloid plaques. Quercetin also

significantly reduced neuroinflammation caused by chronic stress and scopolamine in sensitive areas of the brain, including the hippocampus.

Key words: Quercetin, scopolamine, chronic stress, oxidative stress, passive avoidance memory, Alzheimer's model