Rutin prevents cognitive impairments by ameliorating oxidative stress and neuroinflammation in rat model of sporadic dementia of Alzheimer type


Abstract:
The objective of the present study was to assess the neuroprotective role of rutin (vitamin P) and delineate the mechanism of action. Recent evidence indicates that rutin exhibits antioxidant potential and protects the brain against various oxidative stressors. More precisely, the aim of the present study was to examine the modulating impacts of rutin against cognitive deficits and oxidative damage in intracerebroventricular-streptozotocin (ICV-STZ)-infused rats. Rats were injected bilaterally with ICV-STZ (3 mg/kg), whereas sham rats received the same volume of vehicle. After 2 weeks of streptozotocin (STZ) infusion, rats were tested for cognitive performance using Morris water maze tasks and thereafter euthanized for further biochemical, histopathological, and immunohistochemical studies. Rutin pretreatment (25 mg/kg, orally, once daily for 3 weeks) significantly attenuated thiobarbituric acid reactive substances (TBARS), activity of poly ADP-ribose polymerase, and nitrite level and decreased level of reduced glutathione (GSH) and activities of its dependent enzymes (glutathione peroxidase [GPx] and glutathione reductase [GR]) and catalase in the hippocampus of ICV-STZ rats. ICV-STZ rats showed significant cognitive deficits, which was improved significantly by rutin supplementation. The results indicate that rutin attenuates STZ-induced inflammation by reducing the expression of cyclooxygenase-2 (COX-2), glial fibrillary acidic protein (GFAP), interleukin-8 (IL-8), inducible nitric oxide synthase (iNOS), nuclear factor-kB, and preventing the morphological changes in hippocampus. The study thereby suggests the effectiveness of rutin in preventing cognitive deficits and might be beneficial for the treatment of sporadic dementia of Alzheimer type (SDAT).

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