

Hesperidin as a neuroprotective agent: A review of animal and clinical evidence

Hajialyani M.

Farzaei M.H.

Echeverría J.

Nabavi S.M.

Uriarte E.

Eduardo S.-S.

Neuroprotection is the preservation of function and networks of neural tissues from damages caused by various agents, as well as neurodegenerative diseases such as Parkinson's, Alzheimer's, Huntington's diseases, and multiple sclerosis. Hesperidin, a flavanone glycoside, is a natural phenolic compound with a wide range of biological effects. Mounting evidence has demonstrated that hesperidin possesses inhibitory effect against development of neurodegenerative diseases. Our review discusses neuropharmacological mechanisms for preventive and therapeutic effects of hesperidin in neurodegenerative diseases. In addition, the review examines clinical evidence confirming its neuroprotective function. Various cellular and animal models specific to neurodegenerative diseases have been conducted to evaluate the underlying neuropharmacological mechanisms of hesperidin. Neuroprotective potential of this flavonoid is mediated by improvement of neural growth factors and endogenous antioxidant defense functions, diminishing neuro-inflammatory and apoptotic pathways. Despite the various preclinical studies on the role of hesperidin in the neurodegenerative diseases, less is known about its definite effect on humans. A limited number of clinical trials showed that hesperidin-enriched dietary supplements can significantly improve cerebral blood flow, cognition, and memory performance. Further clinical trials are also required for confirming neuroprotective efficacy of this natural flavonoid and evaluating its safety profile. © 2019 by the authors.

Alzheimer's disease

Hesperidin

Huntington's disease

Neuroprotective mechanisms

Parkinson's disease

antioxidant

flavonoid

hesperidin

neuroprotective agent

animal

apoptosis

degenerative disease

drug effect

human

neuroprotection

Animals

Antioxidants

Apoptosis

Flavonoids

Hesperidin

Humans

Neurodegenerative Diseases

Neuroprotection

Neuroprotective Agents