

Role of Onion Extract for Neuro-Protection in Experimental Stroke Model

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Abstract : The term 'neuroprotection' means preserving/salvaging function and structure of neurons. Neuroprotection is an adjunctive treatment option for neurodegenerative disorders. Oxidative stress is considered a major culprit in neurodegenerative disorders; hence, management strategies include use of antioxidants. Our search for a neuroprotective agent began with *Allium cepa* L. or onions, (family Amaryllidaceae) - a potent antioxidant. We have investigated the neuroprotective potential of onions in experimental models of ischemic stroke, diabetic neuropathy, neuropathic pain, and dementia. In pre and post-ischemic stroke model, the methanol extract of outer scales of onion bulbs (MEOS) prevented memory loss and motor in-coordination; reduced oxidative stress and cerebral infarct size. This also prevented and ameliorated diabetic neuropathy in mice. The MEOS was fractionated to yield a flavonoid rich fraction (FRF) that successfully reversed ischemia-reperfusion induced neuronal damage, thereby demonstrating that the flavonoids are responsible for the activity. The FRF effectively ameliorated chronic constriction induced neuropathic pain in rats. The FRF was subjected to bioactivity-guided fractionation. It was seen that FRF is more effective as compared to the isolated components probably due to synergism among the constituents (i.e., quercetin and quercetin glucosides) in the FRF. The outer scales of onion bulbs have great potential for prevention as well as for treatment of neuronal disorders. Red onions, with higher amounts of flavonoids as compared to the white onions, produced more significant neuroprotection. Thus, the standardized FRF from the waste material of a commonly used vegetable, especially the red variety, may be developed as a valuable neuroprotective agent.

Keywords : *Allium cepa*, antioxidant activity, flavonoid rich fraction, neuroprotection

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