INVESTIGATION OF NEUROPROTECTION AND IN VITRO ANTIOXIDANT ACTIVITIES OF SALVIA MIRZAYANII

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Introduction: The damaging consequences of oxidative stress have been implicated in a variety of very different human disorders, including diseases of the nervous system. It has been established that phytochemicals such as phenolic compounds have potential protective effects against many diseases, such as Alzheimer’s disease (AD).

Methods: The mechanism of the neuroprotective effects of methanolic extract of Salvia mirzayanii, which is endemic to Iran, was assessed by in vitro antioxidant assays, western blot analysis and enzyme activity assays of antioxidant. Oxidative stress was induced by hydrogen peroxide.

Results: The present study indicates that oxidative stress resulting from H₂O₂ can be inhibited in the presence of S. mirzayanii in a dose-dependent manner. This protection was associated with a marked reduction in caspase-3 activation. Also, the extract elevated the glutathione levels. Moreover, the antioxidant enzymes those serve as a detoxifying system to prevent damage caused by ROS was greatly increased in the presence of extract. Treatment of PC12 cells with H₂O₂ caused the increase in the intracellular MDA level, while pre-incubation of cells with extract markedly attenuated the change of MDA level. In addition, while PC12 cells treated with H₂O₂ caused the decrease in the activities of superoxide dismutase (SOD) and catalase (CAT), pretreatment with extract significantly attenuated the decrease of SOD and CAT activity.

Conclusions: As oxidative stress is a critical event in the pathogenesis of neurodegenerative diseases, having neuroprotective effects along with antioxidant properties implies the possibility of using S. mirzayanii as a candidate for treating neurodegenerative diseases like AD.