

Dietary Supplements as a Neuroprotective Agent

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Abstract—Neuroprotection refers to the strategies and relative mechanisms able to struggle down the Central Nervous System (CNS) against neuronal damage caused by various neuropsychiatric and neurodegenerative disorders such as Alzheimer's disease, anxiety, cerebrovascular impairment, seizures, Parkinson's disease, etc. Neurodegenerative diseases are estimated to be the second most common cause of death among elderly by the 2040s. In aging and neurodegenerative disorders, loss of distinct population of neurons in the brain impairs cognitive, motor, sensory, and emotional function. Oxidative stress, mitochondrial dysfunction, inflammation, deteriorated homeostasis of energy, metal and calcium (Ca^{2+}), reduction of neurotrophic factors, and activation of apoptosis have been proposed as the pathogenic factors for neurodegeneration in Parkinson's disease (PD) and Alzheimer's disease (AD), and depression. Treatment of these disorders with prolonged administration of synthetic drugs will lead to severe side effects. It has been proposed that adopting a healthy diet and lifestyle may help delaying the onset of neurodegenerative diseases due to its potential association with vascular disease. In the recent years, scientists have focused the attention of research towards dietary components to cure neurological disorders. Emerging studies show that some food-derived small molecules, also called phytochemicals, may be an effective approach to delay the aging process and age-associated neurodegeneration. In particular, most phytochemicals are secondary plant metabolites and these bioactive compounds are present in a large variety of foods including fruit, vegetables, cereals, nuts, and cocoa/chocolate, as well as in beverages including juice, tea, coffee, and wine. Thus, this study highlights the evidence for the important effects of some dietary components, supplements, and dietary patterns as neuroprotective.

Keywords: Neuroprotection, dietary supplements, neurodegeneration, Alzheimer's Disease, Parkinson's disease.