The Effects of Fisetin and Curcumin on Oxidative Damage Caused by Transition Metals in Neurodegenerative Diseases.

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Abstract

Neurodegenerative diseases pose a significant health challenge for the elderly. The escalating presence of toxic metals and chemicals in the environment is a potential contributor to central nervous system dysfunction and the onset of neurodegenerative conditions. Transition metals play a crucial role in various pathophysiological mechanisms associated with prevalent neurodegenerative diseases such as Alzheimer's and Parkinson's. Given the ubiquitous exposure to metals from diverse sources in everyday life, the workplace, and the environment, most of the population faces regular contact with different forms of these metals. Disturbances in the levels and homeostasis of certain transition metals are closely linked to the manifestation of neurodegenerative disorders. Oxidative damage further exacerbates the progression of neurological consequences. Presently, there exists no curative therapy for individuals afflicted by neurodegenerative diseases, with treatment approaches primarily focusing on alleviating pathological symptoms. Within the realm of biologically active compounds derived from plants, flavonoids and curcuminoids stand out for their extensively documented antioxidant, antiplatelet, and neuroprotective properties. The utilization of these compounds holds the potential to formulate highly effective therapeutic strategies for managing neurodegenerative diseases. This review provides a comprehensive overview of the impact of abnormal metal levels, particularly copper, iron, and zinc, on the initiation and progression of neurodegenerative diseases. Additionally, it aims to elucidate the potential of fisetin and curcumin to inhibit or decelerate the neurodegenerative process.