

Improvement of Cognitive Dysfunction Caused by Aging Using Food Components

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Aging is a progressive and irreversible change that induces physiological and motional impairments of living tissues. According to the free radical theory of aging proposed by Harman in 1956 that reactive oxygen species generated through oxidative stress attack many organs to induce oxidative damages, resulting in several dysfunctions, numerous studies have demonstrated significantly increased irreparable oxidative damage.

Main characteristic of the brain aging is considered to be cognitive deficit caused by neurodegeneration through oxidative stress. In fact, there are increased regional levels of oxidative stress in the brain of Alzheimer's disease (AD), and hence previous studies have demonstrated increased levels of lipid peroxidation markers, protein oxidation, and DNA and RNA oxidation in AD. Consequently it implies that cognitive decline observed in AD is arisen from oxidative neuronal damages caused by oxidative stress.

Our previous findings showed that when rats were subjected to oxidative stress, severe oxidative damages in the hippocampus, neuronal death, the accumulation of amyloid- β -like substances, and decreased acetylcholine release from synapse were observed. In addition, memory function of rats was markedly declined. These abnormal phenomena were significantly improved by supplementation of vitamin E and pyrroloquinoline quinone. However, it is not clear whether this benefit is caused by the antioxidant or the beyond – antioxidant effect.

Recently, to improve the age-related cognitive dysfunction, many studies have been done using foodstuffs such as fruits and vegetables and those components. Although results obtained are occasionally incompatible, the comparison between results is becoming interestingly informative to establish the accurate anti-aging.