Glutathione and Aging

Glutathione, a thiol tripeptide and highly potent intracellular antioxidant, has been studied for its anti-aging properties. The molecule plays pivotal roles in medication metabolism, detoxification of xenobiotics, and protecting cells against oxidative stress-induced cellular damage; glutathione is required for cell survival. With age, however, there is a significant reduction in the body's ability to synthesize glutathione and this decreased synthesis is associated with an increase in oxidative stress as revealed by increased plasma markers of oxidant damage.[1]

Researchers enrolled 39 men and 130 women between the ages of 20 and 94 in a study with the aim of evaluating blood glutathione levels.[2] Participants were all healthy, ambulatory, and free from diabetes mellitus, thyroid disease, anemia, and cancer. Blood glutathione levels in those between the ages of 20 and 39 were compared to that of other participants. Glutathione levels in the 60- to 79-year-old group were 17% lower than that of the reference group. Researchers found that, in apparently healthy, aging adults, there is an increased incidence of low glutathione levels, and that these individuals may be at increased risk for disease because of their decreased capacity to maintain glutathione-related metabolic and detoxification reactions.

When the body is unable to maintain intracellular glutathione concentrations, oxidative stress increases and irreversible cell damage results.[1] Increases in oxidative stress and oxidant damage, such as occur with low levels of glutathione synthesis, have been associated with several aging-related conditions. These include neurological conditions like mild cognitive impairment, Alzheimer's disease,[3] and Parkinson's; cataracts; macular degeneration; and immune deficiencies.[1] Furthermore, free radicals are involved in the pathogenesis of some forms of cancer, diabetes, and atherosclerosis.[4]

In a related experiment, low glutathione levels were found in 36% of individuals who were newly admitted to the hospital with chronic conditions, such as liver disease, cardiovascular disease, and diabetes mellitus, suggesting that low blood glutathione is associated with chronic disease.[5]

Higher blood glutathione levels are positively associated with physical and mental health in older age. Researchers evaluated blood glutathione levels in 87 women between the ages of 60

and 103 who were believed to be in excellent physical and mental health.[6] They compared these women to matched controls. All participants in the treatment group had normal body-mass indices, as well as normal systolic and diastolic blood pressures and average blood glucose values. Fecal occult blood and pulmonary function were also within normal limits in the treatment group, as were chemistry and hematology. Women in the treatment group were found to have high blood glutathione levels, leading researchers to conclude that high blood glutathione levels and excellent physical and mental health are characteristics of long-lived women.

In addition to being associated with excellent health and longevity, glutathione has been demonstrated to decrease visible signs of aging, such as reducing wrinkling and increasing skin elasticity.[7] Another group of researchers found that while aging leads to a decrease in glutathione synthesis, glutathione levels may be safely and effectively improved with adequate supplementation, even in aging individuals.[1]

Reference List

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