

Plasma Antioxidant Minerals(Cu, Fe, Mn, Se, and Zn) in Healthy Adults and Cerebrovascular Disease Patients in Korea

In-Sook Kwun*, Hyun-Sook Jang⁺, Chong-Suk Kwon, Dept. of Food and Nutrition, College of Human Ecology, Andong National University. ⁺Dept. of Home Economics Education, College of Education, Kyungpook National University.

Recently, more attention has been focused on the antioxidant nutrients since the disorder of the free radical events has proven as being involved in aging and a number of chronic diseases such as cerebrovascular disease, cardiovascular disease, and cancer etc. The etiology of such diseases depends on the fact that low intake of the antioxidant nutrients might result in low plasma level of those antioxidant nutrients, which in turn might be related to a high incidence of such chronic diseases. In the present study, the levels of plasma antioxidant minerals(Cu, Fe, Mn, Se, and Zn) in cerebrovascular disease patients were compared with those of the healthy adults to investigate the implication of antioxidant nutrients in this chronic disease. Plasma antioxidant minerals were measured by ICP/MS method in 117 healthy adults aged 21-73 y and 50 cerebrovascular disease patients aged 32-79 y in Korea. The concentrations of five plasma antioxidant minerals($73.5 \pm 3.4 \mu\text{g/dl}$, $115.8 \pm 8.9 \mu\text{g/dl}$, $50.5 \pm 6.2 \text{ng/dl}$, $4.8 \pm 0.6 \mu\text{g/dl}$ and $103.5 \pm 4.4 \mu\text{g/dl}$ for Cu, Fe, Mn, Se and Zn, respectively) in the patients were significantly lower than in those of the trace minerals($81.0 \pm 1.8 \mu\text{g/dl}$, $168.8 \pm 7.8 \mu\text{g/dl}$, $469.9 \pm 35.0 \text{ng/dl}$, $17.0 \pm 0.4 \mu\text{g/dl}$ and $170.7 \pm 5.5 \mu\text{g/dl}$ for Cu, Fe, Mn, Se and Zn, respectively) in the healthy subjects($p < 0.001$). The concentrations of most antioxidant minerals, except Mn and Se in patients group, were in the normal ranges in both groups. In healthy subjects, the plasma Cu, Fe, and Mn concentration decreased significantly with advancing age($p < 0.05$), however, Se and Zn concentration didn't, rather being shown as consistently low level through the whole age ranges. On the other hand, in patients, all of the plasma antioxidant minerals concentrations were not significantly different by age. The sex didn't affect the concentration of the plasma antioxidant minerals in both groups. These results imply that the incidence of the cerebrovascular disease was correlated with the lower plasma antioxidant mineral concentrations(Cu, Fe, Mn, Se, and Zn). Specifically, Se was the major depleted nutrient in the cerebrovascular disease patients.