

EFFECT OF LONG-TERM INTAKE OF HIGH DOSE OF  
VITAMIN C ON FREE RADICAL SCANVENGER  
ENZYMES IN HUMAN ERYTHROCYTES

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It has been well known that vitamin C is essential for maintenance of normal body functions. However, it is not still unknown what consequences will result from its long-term intake of high doses. Based upon the fact that vitamin C is an excellent antioxidant capable of scavenging a wide variety of different oxidants, we assumed that its chronic administration can influence our body's antioxidant status. In an attempt to test this assumption, we compared the activities of several antioxidant enzymes in erythrocytes between control group(10 healthy males, age; 22-25, plasma concentration of vitamin C; 10 ug/ml) who did not have an additional intake of vitamin C except through food and high dose intake group(10 healthy males, age; 22-25, plasma concentration of vitamin C; 28 ug/ml) who have taken 5-10 g of vitamin C per day for more than one year. The results were as follows: The activities of superoxide dismutase and catalase were increased in the vitamin C intake group but the increases were not significant statistically. On the other hand, the activities of glutathione(GSH)-related enzymes such as GSH-peroxidase, GSH-reductase and GST-S-transferase(GST) were significantly lower than those of the control group( $P < 0.01 - 0.05$ ). On western blotting using the monoclonal antibody to GST, the amount of GST in erythrocytes was confirmed to be lowered. These results indicate that long-term intake of high dose of vitamin C can affect our endogenous antioxidant status probably by feedback mechanism in which the increase in antioxidant capacity contributed by vitamin C suppresses the synthesis of scavenger enzymes.