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The effects of amino-copper complex on lipids peroxidation in sera.

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Abstract:
We have investigated the daily nutritional intakes of young women(subjects). The sera of subjects were separated to under molecular weight 50,000 (mw<50,000) and more than 50,000 (mw>50,000) by filter. The copper concentrations in mw<50,000 fraction from subjects under 1600kcal/day intake (low intakes) were significantly higher than those from standard intakes in sera. The copper-dependence oxidation of low-density lipoproteins (LDL) has been reported in many articles, so we studied the lipid peroxides of LDL. A significant increase of the content of thiobarbituric acid reaction substances (TBARS), as used for index of the lipid peroxides, were observed in sera of low intakes. We also observed that lipid peroxides in sera of low intakes were decreased when the concentrations of histidine were increased. So, we studied LDL oxidation of copper at various ratios of the histidine/copper in vitro. The LDL oxidation by the copper might be blocked by chelating of histidine to the copper in mw<50,000. It's appeared to be a more effective peroxyl radical trap. Meanwhile, low concentration of lipid peroxide was observed even though low concentration of histidine in sera of standard intakes. The concentration of glycine was low in sera of standard intakes but high in low intakes. Cu(II) was coordinated by two moles of histidine which has three coordinate functional groups and was coordinated by two moles of glycine which has two coordinate functional groups. The inhibitory effect of histidine and glycine on Cu(II) induced LDL oxidation was examined in vitro. LDL oxidation may be blocked by the chelating of histidine, but not blocked by the chelating of glycine. These results indicated that the increased of glycine in sera of low intakes may make the formation of Cu(II)- glycine chelate and its chelate promote lipid peroxidation in vivo.

Key words: Copper, Lipid peroxide, Histidine, Amino complex, Antioxidant

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