

## COPPER BODY STATUS AND CARDIOVASCULAR DISEASES

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Copper deficiency is associated with a severe cardiomyopathy and EKG ST-T abnormalities. In rats and swine prolonged copper deficiency can provoke hemopericardium, hemothorax and heart rupture. However, the significance of these animal studies in humans is little known. Copper contains superoxide dismutase, an intracellular enzyme which prevents oxidation of lipoproteins. However it is difficult to assess copper body status by plasma copper determination, because copper concentration in plasma has large individual variations.

In this study we investigated copper concentration in post-mortem material from hospitalised patients following sudden death. We determined copper concentration in heart, liver and kidney in 15 males and 18 females aged 35–85. The degree of atherosclerosis in the thoracic, abdominal and coronary arteries was measured by determining an atherosclerosis index on scale of 0–100%. It was two groups: 1—with low atherosclerosis (decreased intimal surface of artery below 70%) and 2—with high atherosclerosis (decreased intimal surface of artery above 70%).

Samples were digested 300  $\mu$ l of 6mol/l nitric acid in 7ml Teflon vessels in a microwave oven and the resulting digests were made up to 2 ml with de-ionized water. Copper was determined by graphite furnace atomic absorption spectroscopy.

There was a statistically significant difference ( $P < 0.05$ ) for the mean liver copper concentration between high and low atherosclerosis. In high atherosclerosis degree in both male and female copper levels was decreased. Also in heart tissue copper concentration was lower ( $P < 0.05$ ), but only in male. In kidney there was no significant difference in copper concentration in both male and female. Our findings indicated that decreased body copper status in humans might be associated with developing of atherosclerosis.