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Korea**Kidney damage markers associated with cadmium exposure in the general population**

Chronic exposure to cadmium (Cd) induces renal tubular damage and oxidative stress, but, limited data are available on the effect of copper (Cu) - zinc (Zn) imbalance on Cd induced toxicity. The purpose of this study was to assess the effects of environmental Cd exposure and Cu - Zn imbalance on renal tubular damage and oxidative stress in population living in a Cd polluted area. The subjects of this cross-sectional study were 979 adults, who were 30 years old or older, and had been living more than five years within 15 km of a closed copper refinery. We measured Cd concentrations in blood and urine and copper (Cu) and zinc (Zn) levels in serum. Urinary levels of β 2-microglobulin (β 2-MG) and N-acetyl- β -D-glucosaminidase (NAG) activity, as markers for renal tubule damage, and urinary concentration of Malondialdehyde (MDA), as an oxidative stress marker, were analyzed. The geometric mean concentrations of Cd in urine were 2.25 μ g/g creatinine. Urinary Cd levels were positively correlated with urinary NAG activity, β 2-MG and MDA levels, but not with serum Cu/Zn ratio (CZR). There was a significant correlation between serum Cu/Zn ratio and urinary MDA level. When stratified by urinary Cd level, urinary β 2-MG level was strongly associated with serum CZR in low urinary Cd group (β =1.198, P =0.020), and with urinary Cd level in high urinary Cd group (β =1.061, P =0.001). After adjustment for covariates, serum Cu/Zn ratio was significantly associated with urinary MDA levels regardless of urinary Cd level. These findings indicate that imbalance in Cu and Zn is a determinant for oxidative stress and renal tubular damage in population chronically exposed to Cd, and that proper Zn supplementation is needed to prevent adverse health effects by Cd.

Biography

Heon Kim has his expertise in Environmental Epidemiology and passion in finding new biological markers for environmental pollutants. He has performed environmental epidemic surveys on the health effects of chronic cadmium exposure in people who have been living near a closed copper refinery and have been following up those with high blood or urinary cadmium levels.

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