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Concentrations of Chromium, Selenium, and Copper in the hair of visceral-obese adults are associated with insulin resistance

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Visceral adiposity is linked to the development of insulin resistance, which is a condition that may contribute to metabolic abnormalities and cardiovascular disease. Various minerals play essential roles in different metabolic functions in the body. Thus, the relationships between mineral concentrations in hair and insulin resistance were analyzed in 144 Korean adults (71 visceral-obese subjects and 73 normal control subjects) in this cross-sectional study. Visceral obesity was measured using a bioelectrical impedance analysis (BIA) and insulin resistance levels were assessed using the homeostasis model assessment insulin resistance (HOMA-IR) index. The visceral-obese group exhibited significantly higher levels of serum glucose (96.5 versus 91.0 mg/dL, $P = 0.023$), insulin concentration (4.78 versus 2.98 $\mu\text{IU/mL}$, $P = 0.003$), and the HOMA-IR index (1.18 versus 0.64, $P = 0.003$) compared with the normal control group. After adjusting for age and sex, there was a positive correlation between copper levels in hair and the HOMA-IR index in the visceral-obese group ($r = 0.241$, $P = 0.046$) whereas chromium and selenium levels in hair were negatively correlated with the HOMA-IR index ($r = -0.256$, $P = 0.034$, and $r = -0.251$, $P = 0.038$, respectively). Thus, chromium and selenium levels in the hair of visceral-obese adults were inversely associated with insulin resistance, whereas copper levels in the hair were positively associated with insulin resistance. This suggests that the mineral status of visceral-obese adults might play a role in the development of insulin resistance.

Biography

Ha-Na Kim has completed her MSc at the age of 34 years from the catholic university of Korea and is doing her doctoral studies at the same university of medicine. She is an associate professor of the department of Family medicine, college of Medicine, the catholic university of Korea. Sang-Wook Song has completed his PhD in industrial medicine in 1999 from the catholic university of Korea. He is a professor of the department of Family medicine, college of Medicine, the catholic university of Korea, and a director of health promotion center in St. Vincent's Hospital.

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