

Sex specific differences in elemental movement from blood to hair

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Abstract

We investigated the relationships between the element concentrations in blood and hair to clarify the sex-specific differences in elemental movement from blood to hair, as we confirmed the presence of large sex-specific differences in the concentrations of certain elements in hair in our previous study. First, we compared the elemental concentrations in serum/plasma taken from healthy people (n = 148 females, 142 males) and found that there were significant differences (up to 20%) between females and males in levels of phosphorus, sulfur, calcium, bromine, and lead. We then examined the sex-specific differences in the elemental transfer factors from blood to hair by analyzing plasma and hair samples that had been simultaneously collected from the same people (20 females, 21 males). Calcium and selenium showed significant differences in transfer factors from plasma to hair. Particularly large sex-specific differences in the calcium concentration were explained by the difference in the transfer factors from blood to hair. We also examined the sex-specific differences among teenaged subjects alone (n = 47 females, 9 males; average age was approximately 17 years old) and noted no significant difference in the transfer factors between sexes. Taken together, these findings indicate that the transfer factors themselves are influenced by the excretion of sex hormones.