

Elemental concentration in the hair taken from healthy people
for the past 20 years
-2. Sex-specific differences and changes with age -

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Abstract

A standard-free method for untreated hairs has been applied to quantitative analysis of the hairs taken from 1256 healthy people living in the Iwate prefecture, Japan. It was found that there are clear sex-specific differences in the concentration of some elements. Concentrations of many essential elements, such as calcium, magnesium, iron, copper, zinc and bromine, are clearly higher for female. In particular, calcium concentration is 2.6 times higher for female in comparison with that for male. Contrarily, concentrations of some toxic elements such as chromium, arsenic and mercury are higher for male. On the other hand, concentrations of many elements vary with age. Those of calcium, magnesium and zinc start to increase in the middle of teens and reach maximum in the middle of twenties for female. Mercury concentration increases as the ages advance, while those of chromium, arsenic and lead show no clear changes with age. Moreover, hairs taken from university and high school students were analyzed and the results were compared with those for general healthy people in order to clarify differences depending on living environments. As a result, high school students show the lowest values for many essential and toxic elements.