

HAIR ANALYSIS AND ZINC CONTAMINATION

R.A. BUCKLEY and I.E. DREOSTI

Hair has been used for many years to assess trace element status in humans, especially with regard to zinc. However, the trace element composition of hair is determined by the entry of metals endogenously from the bloodstream and exogenously from the external surface of the hair. Because of the problem of contamination, one of the problems in interpreting trace element analyses of hair is separating the endogenous from the exogenous contributions. This is usually accomplished by washing the hair in one of several ways which are claimed by some to be effective (Gibson 1980) but not by others (Riolin 1983).

In order to study the question further in our laboratory, recommended washing procedures were investigated in relation to the removal of exogenously applied ^{65}Zn from human hair and endogenously incorporated ^{65}Zn from rat hair. Absorption of zinc and several other metal ions onto human hair suggested some ion-exchange capacity. Uptake of zinc varied considerably between human hair samples, but generally accumulation of zinc occurred rapidly and often resulted in hair zinc levels several fold higher than in control samples. Removal of zinc and other metal ions was greatest following washing with disodium E.D.T.A. and sodium lauryl sulphate than after treatment with water or aqueous Triton X100. It should be stressed however, that no procedure effectively removed all exogenous zinc, while all treatments extracted varying amounts of the endogenous or "biological" zinc component. Because of the failure of standard washing procedures to remove contaminating zinc without reducing the "indicator" zinc levels, use of hair zinc analyses to indicate nutritional zinc status are inadvisable if hair zinc contamination is likely to have occurred.

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CSIRO Division of Human Nutrition,
Kintore Avenue, Adelaide, South Australia 5000