

Determination of normal concentration levels of Cd, Cr, Cu, Hg, Pb, Se and Zn in hair of the child population in the Czech Republic

Beneš B.¹, Sladká J.², Spěváčková V.¹, Šmíd J.¹

¹National Institute of Public Health, Prague, Czech Republic

² Regional Health Center, Plzeň, Czech Republic

SUMMARY

Knowledge of normal levels of concentrations of trace elements (Cd, Cr, Cu, Hg, Pb, Se and Zn) in the population serve, among others, in the designing of regulations of exposure limits and prevention of diseases caused by deficiency in essential trace elements. Concentrations of the named elements in the hair of children in the Czech population were determined by means of atomic absorption spectrometry. The samples of hair were collected during 1994–2001 from 3,556 children (1,741 boys and 1,815 girls, average age 9.9 years). Mineralization in a microwave digestion system was used following a washing procedure. The accuracy of results was checked by means of the control materials CRM Human Hair GBW 07601. Values of concentrations of the trace elements in hair found for children were (in medians) 0.14 µg Cd.g⁻¹, 0.22 µg Cr.g⁻¹, 12 µg Cu.g⁻¹, 0.19 µg Hg.g⁻¹, 1.6 µg Pb.g⁻¹, 0.22 µg Se.g⁻¹ and 124 µg Zn.g⁻¹, respectively. Statistically significant differences between boys and girls were found for Cd, Cu and Zn. Concentrations of the elements under study correspond to the published values for the non-exposed population.

Key words: trace elements, hair, children, normal values

Address for correspondence: B. Beneš, National Institute of Public Health, Šrobárova 48, 100 42 Prague 10, Czech Republic. E-mail: bbenes@szu.cz