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[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(539K\)\]](#) [\[References\]](#)

High Toxic Metal Levels in Scalp Hair of Infants and Children

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Abstract:

We measured the toxic metal contents in 5846 hair samples from infant to elderly to estimate their exposure levels. The geometric means of hair mercury levels in male adults showed age-related increase from 2.4 $\mu\text{g/g}$ at high-teens up to a peak of 5.9 $\mu\text{g/g}$ at 50's, and then decreased with further aging. In children, at the age of 4-15 years, a small peak of 3.1 $\mu\text{g/g}$ was observed. The hair mercury levels in female were significantly lower than those in male. A similar, age-related accumulation profile with gender difference was also observed with arsenic in hair. The mean arsenic levels in male age-dependently increased up to 98 ng/g at the 80's elderly, with a small peak of 66 ng/g at the age of 10-15 years. A similar, but lower age-related accumulation pattern was observed in female. Cadmium and lead showed another type of accumulation profile: the highest levels were observed in the infants aged 1-3 years both for male and female, with neither marked age-dependency nor gender difference. Aluminium also exhibited a similar accumulation profile with the highest levels at infants and young children, as well as cadmium and lead. These findings indicate that the toxic metals are classified to two types based on their accumulation profiles, and some elements having high accumulation in infants and children, namely cadmium, lead and aluminium, should be reconsidered and surveyed as risky metal to the young generation.

Key words: Toxic metals, Age-related accumulation, Gender difference, Infants, Children



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