Hair Zinc and Severity of Symptoms Are Increased in Children with Attention Deficit and Hyperactivity Disorder: a Hair Multi-Element Profile Study.

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Abstract

Determination of bioelement levels in hair is an emerging non-invasive approach for screening bioelement deposition. However, the role of essential bioelement levels in hair and attention deficit/hyperactivity disorder (ADHD) risk or severity is largely unknown. In this study, we have compared multi-element hair profiles between healthy and ADHD Thai children. In addition, the correlations between bioelements and ADHD symptoms according to Diagnostic and Statistical Manual of Mental Disorders, 5th edition, diagnostic criteria were identified. A case-control study was conducted in 111 Thai children (45 newly diagnosed ADHD and 66 matched healthy), aged 3-7 years, living in Bangkok and suburban areas. Levels of 39 bioelements in hair were measured by ICP-MS. Among the analysed bioelements, Cu/Zn and P/Zn ratios in ADHD children were significantly lower than those in healthy children. Indeed, increased hair Zn level was correlated with more symptoms of inattention, hyperactivity, and total ADHD symptoms. Higher Zn content was also associated with being female and older age. Furthermore, Zn in hair was positively correlated with levels of Ca, Mg, and P; however, it showed a negative correlation with Al, As, Fe, and Mo. These findings warrant further confirmation in a large-scale study.

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