Topic: Electronic waste

Title: Effects of lead and cadmium exposure from electronic waste on child physical growth.

Conclusion: Primitive e-waste recycling may threaten the health of children

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Abstract: Many studies indicate that lead (Pb) and cadmium (Cd) exposure may alter bone development through both direct and indirect mechanisms, increasing the risk of osteoporosis later in life. The aim of this study was to investigate the association between Pb and Cd exposure, physical growth, and bone and calcium metabolism in children of an electronic waste (e-waste) processing area. We recruited 246 children (3-8 years) in a kindergarten located in Guiyu, China. Blood lead levels (BLLs) and blood cadmium levels (BCLs) of recruited children were measured as biomarkers for exposure. Serum calcium, osteocalcin, bone alkaline phosphatase, and urinary deoxypyridinoline were used as biomarkers for bone and calcium metabolism. Physical indexes such as height, weight, and head and chest circumference were also measured. The mean values of BLLs and BCLs obtained were 7.30 µg/dL and 0.69 µg/L, respectively. The average of BCLs increased with age. In multiple linear regression analysis, BLLs were negatively correlated with both height and weight, and positively correlated with bone resorption biomarkers. Neither bone nor calcium metabolic biomarkers showed significant correlation with cadmium. Childhood lead exposure affected both physical development and increased bone resorption of children in Guiyu. Primitive e-waste recycling may threaten the health of children with elevated BLL which may eventually cause adult osteoporosis.

Keywords: e-waste, lead, child