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The contribution of dental amalgam to urinary mercury excretion in children.

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BACKGROUND: Urinary mercury concentrations are widely used as a measure of mercury exposure from dental amalgam fillings. No studies have evaluated the relationship of these measures in a longitudinal context in children. OBJECTIVE: We evaluated urinary mercury in children 8-18 years of age in relation to number of amalgam surfaces and time since placement over a 7-year course of amalgam treatment.

METHODS: Five hundred seven children, 8-10 years of age at baseline, participated in a clinical trial to evaluate the neurobehavioral effects of dental amalgam in children. Subjects were randomized to either dental amalgam or resin composite treatments. Urinary mercury and creatinine concentrations were measured at baseline and annually on all participants.

RESULTS: Treatment groups were comparable in baseline urinary mercury concentration (approximately 1.5 microg/L). Mean urinary mercury concentrations in the amalgam group increased to a peak of approximately 3.2 microg/L at year 2 and then declined to baseline levels by year 7 of follow-up. There was a strong, positive association between urinary mercury and both number of amalgam surfaces and time since placement. Girls had significantly higher mean urinary mercury concentrations than boys throughout the course of amalgam treatment. There were no differences by race in urinary mercury concentration associated with amalgam exposure.

CONCLUSIONS: Urinary mercury concentrations are highly correlated with both number of amalgam fillings and time since placement in children. Girls excrete significantly higher concentrations of mercury in the urine than boys with comparable treatment, suggesting possible sex-related differences in mercury handling and susceptibility to mercury toxicity.