

# Lead, mercury, and cadmium exposure and attention deficit hyperactivity disorder in children.

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## BACKGROUND:

There is limited research examining the relationship between lead (Pb) exposure and medically diagnosed attention deficit hyperactivity disorder (ADHD) in children. The role of mercury (Hg) and cadmium (Cd) exposures in ADHD development is even less clear.

## OBJECTIVES:

To examine the relationship between Pb, Hg, and Cd and ADHD in children living inside and outside a Lead Investigation Area (LIA) of a former lead refinery in Omaha, NE.

## METHODS:

We carried out a case-control study with 71 currently medically diagnosed ADHD cases and 58 controls from a psychiatric clinic and a pediatric clinic inside and outside of the LIA. The participants were matched on age group (5-8, 9-12 years), sex, race (African American or Caucasians and others), and location (inside or outside LIA). We measured whole blood Pb, total Hg, and Cd using inductively coupled plasma mass spectrometry.

## RESULTS:

Inside the LIA, the 27 cases had blood Pb geometric mean (GM) 1.89 $\mu$ g/dL and the 41 controls had 1.51 $\mu$ g/dL. Outside the LIA, the 44 cases had blood Pb GM 1.02 $\mu$ g/dL while the 17 controls had 0.97 $\mu$ g/dL. After adjustment for matching variables and maternal smoking, socioeconomic status, and environmental tobacco exposure, each natural log unit blood Pb had an odds ratio of 2.52 with 95% confidence interval of 1.07-5.92. Stratification by the LIA indicated similar point estimate but wider CIs. No associations were observed for Hg or Cd.

#### CONCLUSIONS:

Postnatal Pb exposure may be associated with higher risk of clinical ADHD, but not the postnatal exposure to Hg or Cd.