Childhood Blood Lead Levels and Symptoms of Attention Deficit Hyperactivity Disorder (ADHD): A Cross-Sectional Study of Mexican Children.


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Abstract
BACKGROUND:
Previous studies suggest that blood lead levels are positively associated with attention deficit hyperactivity disorder (ADHD) and ADHD-symptoms in children. However, the associations between lead exposure and ADHD subtypes are inconsistent and under-studied.

OBJECTIVE:
The objective of this study was to explore the association of low-level concurrent lead exposure with subtypes of ADHD-symptoms in 578 Mexican children aged 6 to 13 years.

METHODS:
We measured concurrent blood lead levels using Inductively Coupled Plasma Mass Spectrometry (ICPMS). We administered the Conners’ Rating Scales-Revised (CRS-R) to mothers to evaluate their children’s ADHD-symptoms. We filled missing values in blood lead levels with imputation method and used segmented regression models adjusted for relevant covariates to model the non-linear relationship between blood lead and ADHD-symptoms.

RESULTS:
Mean ± SD blood lead levels were 3.4 ± 2.9µg/dL. In adjusted models, a 1-µg/dL increase in blood lead was positively associated with Hyperactivity and Restless-Impulsivity scores on the CRS-R scale and Hyperactivity-Impulsivity scores on the CRS-R scale of the Diagnostic and Statistical Manual of Mental Disorders IV, but only in children with blood lead < 5µg/dL. Blood lead was not associated with Inattentive symptoms or overall ADHD behavior.

CONCLUSIONS:
In this population of Mexican children, current blood lead level among children with low exposure (< 5µg/dL) was positively associated with hyperactive/impulsive behaviors, but not with inattentiveness. These results add to the existing evidence of lead-associated neurodevelopmental deficits at low levels of exposure.