Lead exposure linked to academic, discipline problems

**Description:** The Wisconsin Children’s Lead Levels and Educational Outcomes project matched data from the Wisconsin Childhood Lead Poisoning Prevention Program (WCLPPP) with test scores from the fourth-grade Wisconsin Knowledge and Concepts Exam (WKCE). Researchers compared the lead levels in children’s blood before age 3 (from the WCLPPP) with WKCE scores and disciplinary records for children from 1,133 families in Milwaukee and Racine that met the study criteria.

**Relevance:** Childhood lead poisoning is a well-known major public health issue, and it is estimated that children’s blood lead levels in Wisconsin are more than twice the national average. The levels of lead poisoning commonly seen in the state are not widely associated with serious health problems, but they may be linked to cognitive and behavioral problems that affect children’s school experience and performance.

**Results:** Almost 3,800 children were matched via the WCLPPP and WKCE records. In this group, approximately 80 percent of African American children and 64 percent of Hispanic children had lead in their blood, compared with 38 percent of white children.

After controlling for demographic and socioeconomic differences, data analysis found that children who had moderate lead exposure before age 3 scored significantly lower than non-exposed children on the fourth-grade WKCE. Lead exposure also was associated with a 40 percent to 70 percent increase in the odds of classification in a lower proficiency category, which has important implications for grade advancement and placement.

Additional analysis focused on suspensions and lead exposure. This investigation found that children exposed to lead at an early age were more than twice as likely to be suspended in the fourth grade as unexposed children. Nationally, African American students are three times more likely to be suspended than white students. The same discipline gap was found in this Wisconsin study, but 23 percent of the disparity was explained by differences in rates of lead exposure.

Although lead exposure traditionally has been treated as a public health problem, these results suggest that it also must be considered an educational problem by directly measuring the impact of exposure on educational outcomes. Health interventions among the moderately poisoned should be a funding and policy priority with both health and educational implications.

The researchers plan to use these results in a grant application to the Environmental Protection Agency with the hypothesis that lead exposure is not only higher for children who live in housing built prior to 1950, but children who live closer to major roads. Deposition from lead gasoline in soils has been associated with increased blood lead levels in children in Wisconsin; children who live near major roads may be more likely to have higher levels of lead exposure.


**KEY INFORMATION**

**Grantee:** Marty Kanarek, PhD, MPH, UW School of Medicine and Public Health, Department of Population Health Sciences

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