

Lead exposure linked to lower quality sleep in youth

October 17 2019, by Nardy Baeza Bickel



Credit: CC0 Public Domain

Youth who are exposed to lead may have a harder time getting a good night's sleep, which may affect their cognitive abilities, according to a University of Michigan study in Mexico.

"One of the most consistent adverse consequences of [lead exposure](#) in kids is poor neurocognitive outcomes. And we also know that suboptimal sleep is highly related to neurocognitive issues in kids," said Erica Jansen, research assistant professor at U-M's School of Public Health. "This highlights the possibility that sleep could play an intermediary role between lead [exposure](#) and cognitive outcomes."

The first step in disentangling this pathway was to determine whether lead exposure and sleep were indeed connected.

"We did find associations between higher cumulative lead exposure over [early childhood](#) with shorter sleep duration measured in adolescence," Jansen said. "Those in the upper 25 percent of [blood lead levels](#) slept, on average, 23 minutes less than those in the lowest 25 percent."

The study, published in the *Journal of Clinical Sleep Medicine*, included 395 participants from the Early Life Exposure in Mexico to ENvironmental Toxicants (ELEMENT) project, a group of sequentially enrolled birth cohorts from Mexico City that have been monitored for up to 25 years.

Principal investigators of this long-standing collaboration are Karen Peterson of the Department of Nutritional Sciences in the U-M School of Public Health and Martha Tellez-Rojo of the National Institute of Public Health in Mexico.

Blood lead levels were measured from ages 1 to 4 years and used to calculate a cumulative measure of early childhood lead levels. Average sleep duration, sleep fragmentation and movement during sleep were assessed once between the ages of 9 and 18 with wrist actigraphs worn for a continuous seven-day interval. These measures were then compared to lead levels divided into quartiles per exposure, adjusted for age, sex and maternal education.

In addition to the finding that higher childhood lead exposure was related to shorter sleep duration in adolescence, higher cumulative lead was associated with higher sleep fragmentation and movement index in younger adolescents (under 14 years old).

To further understand the specific sleep problems kids with high lead exposure may be facing, the researchers are beginning to analyze a new wave of follow-up that includes additional markers of sleep quality and sleep difficulties.

"We don't know if the participants were getting shorter duration because they're having a hard time falling asleep or if they're they waking up early and having difficulty getting back to sleep," Peterson said. "Having the self-reports about the quality (e.g., whether they wake up feeling refreshed) and any sleep problems they're experiencing (e.g., difficulty falling asleep) over a week span is going to help us determine why their sleep is different from the kids with lower lead exposure."

Although the researchers did not investigate neurocognitive outcomes in this wave of the study, their findings on lead exposure and sleep pave the way for a deeper investigation into the pathways linking lead, sleep and cognition among children. They also plan to examine other toxicant exposures.

"Sleep has very rarely been considered as a potential consequence of toxicant exposure, but the environmental health sciences field is becoming more aware of these possible connections," Peterson said. "We hope our findings on lead and sleep spur more investigation into this growing area."

More information: Childhood Lead Levels in Relation to Sleep During Adolescence, *Journal of Clinical Sleep Medicine* (2019). [DOI: 10.5664/jcsm.7972](https://doi.org/10.5664/jcsm.7972)

Early Life Exposures in Mexico to ENvironmental Toxicants
(ELEMENT): sph.umich.edu/cehc/element/index.html Erica C. Jansen
et al. Cumulative

Provided by University of Michigan

Citation: Lead exposure linked to lower quality sleep in youth (2019, October 17) retrieved 21
July 2023 from <https://medicalxpress.com/news/2019-10-exposure-linked-quality-youth.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.