

STRONG CHILDREN'S RESEARCH CENTER

Summer Research Scholar

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ABSTRACT

Title: *Association Between Hearing Loss and Elevated Blood Lead Levels in Urban Pediatric Population*

Background: Lead poisoning is known to be a cause for delayed development and to have a negative effect on neurological development¹. The most common exposure to lead is through lead paint chips and lead dust. Thus, children are uniquely at risk as they exhibit more risky behavior like hand-to-mouth behaviors with non-food items to explore their environment, particularly in the toddler years. This exposure is where older houses have more lead paint before the 1980s, including urban settings. One notable problem associated with elevated blood lead levels (BLL) is hearing loss. Many studies have established a relationship between elevated BLL^{2,3,4,5}; however, the identification of hearing loss among children with elevated BLL in an urban pediatric population is unknown. For this study, we looked at the association between elevated blood lead levels and hearing loss at an urban pediatrics clinic in Upstate New York.

Objectives: For this study, we looked at the association between elevated blood lead levels (BLL) and hearing loss and describe the demographic characteristics of children with elevated BLL at an urban pediatrics clinic in Upstate New York.

Methods: We conducted retrospective chart review of electronic medical records for a subsample of patients aged 4 months to 20 years who were identified as having elevated blood lead levels (greater than or equal to 5 ug/dl) at a large, urban general pediatric practice (which sees approximately 20 thousand children annually) between March 2006 through July 2024. The following variables were reviewed: The most recent elevated Blood Lead Level (BLL); highest BLL ever recorded; diagnosis of sensorineural hearing loss occurring after the first elevated BLL, audiology referrals, and demographic factors (age, race/ethnicity, gender). Frequencies were calculated for categorical variables (N; %), and descriptive statistics (mean; SD) for variables that are continuous using IBM SPSS Statistics (Ver 29).

Results: Our research did not find an association between elevated BLL and hearing loss as seen in prior work, despite patients being from an urban setting where there is a likely higher risk of lead poisoning.

Discussion: The lack of relationship could be due to limited identification of hearing problems. While national guidelines from AAP for providers caring for patients with elevated lead levels include assessment for development delays, specific assessment for hearing loss is not included, even though prior research suggests a relationship. We need to examine and revisit the current AAP recommendations for developmental screenings to emphasize checks for hearing when there is an elevated BLL. One limitation is that this includes the subsample of 199 from 407 patients with elevated BLL between 2006 and 2024; thus, it is possible that some of patients whose data was not reviewed for this study do have sensorineural hearing loss.

Conclusion: More research is needed in pediatric settings to assess auditory supports for children with elevated BLL.

References

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