

Regular Breakfast and Blood Lead Levels among Preschool Children

Abstract

Background

Previous studies have shown that fasting increases lead absorption in the gastrointestinal tract of adults. Regular meals/snacks are recommended as a nutritional intervention for lead poisoning in children, but epidemiological evidence of links between fasting and blood lead levels (B-Pb) is rare. The purpose of this study was to examine the association between eating a regular breakfast and B-Pb among children using data from the China Jintan Child Cohort Study.

Methods

Parents completed a questionnaire regarding children's breakfast-eating habit (regular or not), demographics, and food frequency. Whole blood samples were collected from 1,344 children for the measurements of B-Pb and micronutrients (iron, copper, zinc, calcium, and magnesium). B-Pb and other measures were compared between children with and without regular breakfast. Linear regression modeling was used to evaluate the association between regular breakfast and log-transformed B-Pb. The association between regular breakfast and risk of lead poisoning (B-Pb ≥ 10 $\mu\text{g/dL}$) was examined using logistic regression modeling.

Results

Median B-Pb among children who ate breakfast regularly and those who did not eat breakfast regularly were 6.1 $\mu\text{g/dL}$ and 7.2 $\mu\text{g/dL}$, respectively. Eating breakfast was also associated with greater zinc blood levels. Adjusting for other relevant factors, the linear regression model revealed that eating breakfast regularly was significantly associated with lower B-Pb ($\beta = -0.10$ units of log-transformed B-Pb compared with children who did not eat breakfast regularly, $p = 0.02$).

Conclusion

The present study provides some initial human data supporting the notion that eating a regular breakfast might reduce B-Pb in young children. To our knowledge, this is the first human study exploring the association between breakfast frequency and B-Pb in young children.