Childhood Lead Screening in Tbilisi, Republic of Georgia

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BACKGROUND

Lead exposure is an important public health problem that causes cumulative toxicity in multiple body systems. Children are particularly vulnerable to its neurotoxic effects and therapy consists of removal of the exposure source and good nutrition. Georgia is a country with a population of 3.7 million, a third of which lives in Tbilisi that contains new and old dwellings relatively concentrated in separate areas. There is no data on lead exposure or levels in children in Georgia. The aim of the study was to describe the blood lead level (BLL) in children living in Tbilisi.

OBJECTIVE

Assess the accuracy of various apps for determining substance weight.

METHODS

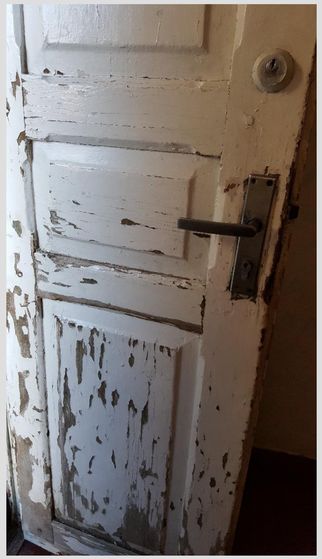
Georgian National Center for Disease Control and Public Health (NCDC) conducted a cross-sectional pilot study between November 22 and December 31, 2015 using a convenience sample of children aged 2-5 years visiting the private, tertiary Iashvili Children Hospital in Tbilisi. Technical support was provided by Emory University, the United States Centers for Disease Control and Prevention, and the American Clinic in Tbilisi. Institutional review board approval was obtained from the NCDC. Venous BLLs were measured using a LeadCare II analyzer provided by Magellan Inc. The blood draw was already being performed on the child during the visit. The home address was classified as belonging to the old or new part of the city based on a predesigned list. Descriptive statistics were calculated to determine the geometric mean, median, percentile and quartile values. All results were generated using SAS. BLLs that were below the detection limit of 3.3 mcg/dl were converted to 3.3 mcg/dl.

DESCRIPTIVE DATA

Results: descriptive statistics (254 observations in total)

Statistic	BLL<3.3 is substituted by BLL=3.3
MEAN	5.7
MEDIAN	3.9
MAX	57.0
MIN	3.3
STD Deviation	5.3
Percantage(BLL>5)	33%
Percantage(BLL>10)	9.5%
Percantage (BLL>20)	2.8%
Percantage (BLL>45)	0.4%

PHOTOS FROM RESIDENCE OF SUBJECT WITH HIGHEST BLL



CONTACT INFORMATION

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RESULTS

254 children were included. 58.7% were male. 70.5% of children were aged between 2 and 4, 24.4% were 4 years old and 5.1% were 5 years old. 24% were living in the old part of the city. The BLL geometric mean was 5.7 mcg/dl and the median was 3.9 mcg/dl. The range was 3.3 to 57.0 mcg/dl with a standard deviation of 5.3. 33% of BLLs were ≥ 5 mcg/dl, 9.5% ≥ 10 mcg/dl, 2.8% ≥ 20 mcg/dl and 0.4%≥45 mcg/dl. The mean BLL was 7.6 mcg/dl in children living in the old part of Tbilisi. Log-rank test showed a statistically significant difference (p=0.0136) in BLL for new and old regions. There was no statistically significant difference for gender or age group.

DISCUSSION

Based on this sample, the BLL in children is higher than the data from the USA. Although only 2.8% had a BLL ≥ 20 mcg/dl and 0.4% ≥ 45 mcg/dl, there is a need for public health action to eliminate any lead exposure in children and decrease the percentage with BLL ≥ 5 or 10 mcg/dl. The sample size is small and not random, the age of the dwelling is unknown and there was no subject data collected to inform about possible sources of exposure. Therefore our results are not generalizable.

CONCLUSION

Further research should be performed at a population level with a focus on old dwellings and include an environmental component.