

HEAVY METALS IN BLOOD OF PRE- AND PERI-PUBERTAL GIRLS IN CALIFORNIA, BY DEMOGRAPHIC CHARACTERISTICS

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Background and Aims: The Breast Cancer and the Environment Research Centers are investigating whether exposures to potential hormonally active chemicals affect the onset of puberty, which influences later health, including risk of breast cancer. Higher lead levels have been associated with delayed puberty, but other metals have not been examined. The aim of this analysis was to determine the distribution of blood metals, such as cadmium, lead, and mercury, in young girls, and their variation by key variables.

Methods: In California, girls were recruited at ages 6-8 for the longitudinal study that includes annual anthropometry, tanner staging, questionnaire completion and bio-sampling. Nearly 350 baseline blood samples were assayed for a metal panel using high through-put ICP-MS with low detection limits. The distributions were examined and geometric means compared for lead and mercury across categories of race/ethnicity, age (at time of blood draw), BMI, care-giver education, care-giver income and home ownership in adjusted models. Cadmium was examined as detected or not in logistic regression models.

Results: Lead and mercury were detected in over 98%; lead levels were similar to children in NHANES 2005-06 (median 0.92 vs. 0.97 ug/dL), but mercury levels were higher (median 0.56 vs. 0.41 ug/L, respectively). Blood lead levels were higher among Black and Hispanic girls and those living in rented homes, still significant after adjustment. Blood mercury levels were much higher among Asians than Whites and lower among Hispanics and the youngest girls. Cadmium was detected in 51%; the detection frequency varied by age, race and parental education. The adjusted OR for Asians was 5.2 (95% CI 2.1-13.2) and among 9 versus 6 year olds was 0.33 (95% CI 0.12-0.93).

Conclusions: Metals were detected with a high frequency among young girls and levels varied by characteristics that may be related to puberty, which will be examined further.