NEONATAL LEAD POISONING FROM MATERNAL PICA BEHAVIOR DURING PREGNANCY

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Lead toxicity has gained increasing attention in the public media because of its ubiquitous distribution in the environment and the potentially serious medical complications that it can induce, particularly in children. We present a case of an asymptomatic Hispanic woman who exhibited a unique form of pica during her pregnancy. By serendipity, she agreed to enroll into a lead screening study at our medical center when she presented to deliver her child. Her blood lead level was 119.4 μg/dL at delivery, and simultaneous measurement of the neonate's cord blood lead level was 113.6 μg/dL. The infant underwent an exchange transfusion, and the mother was treated with oral 2,3-dimercaptosuccinic acid. Both demonstrated dramatic biochemical improvement. (*J Natl Med Assoc.* 2001;93:317–319.)

Pica is a disorder of ingesting nonfood substances after 18 months of age. This behavior has been noted more commonly in children and in pregnant women.[1] Poor nutrition and mineral deficiency can precipitate the pica behavior, although the exact cause may vary in different individuals. Pica of clay dirt (geophagia) is an important source of lead,[2] and is not uncommon among African Americans in the southeastern United States.[3] Geophagia has also been observed among migrant Mexicans.[4] Pica of ice (pagophagia) and starch (amylophagia) are also common forms of pica, but have not been associated with lead exposure. We report a unique variant of pica, that of ingesting pieces of clay pottery. In addition to satisfying a craving during pregnancy, this practice is thought by some communities to provide the necessary calcium, iron, and other minerals needed during pregnancy. However, the prevalence and complications of this practice are not clear.

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CASE REPORT

A 25-year-old, gravida 6, para 4, Hispanic female presented to the Obstetric Department for prenatal care and was given a prescription for multivitamins but they were never obtained. She believed from her family and friends that ingesting clay pottery could provide the necessary minerals. The patient obtained a clay pot from Mexico and broke it into small pieces from which she gradually ingested a handful of clay pieces each day for several months during her pregnancy. The actual pottery ingested is no longer available; however, a picture of a similar clay pot provided by the patient is shown (Fig. 1). She had an uncomplicated prenatal course except for occasional headaches, dizziness, and forgetfulness. She denied abdominal pain or any neurological symptoms. She gained 20 pounds during her

Figure 1. A picture of a clay pot provided by the patient that was obtained at local Mexican supermarket in Los Angeles and similar to the clay pot the patient broke into pieces and ingested

pregnancy. Her physical examination was unremarkable. Her hemoglobin was 8.5 g/dL and hematocrit was 25.8%. When she returned to the medical center for delivery of her child, she was entered into a lead screening study. She delivered a baby boy at 41 weeks of gestation, weighing 3870 g, 53 cm in length. Apgar score was 9 at 1 minute and 9 at 5 minutes. The infant's hemoglobin was 13.6 g/dL, hematocrit was 39.9%, and platelet count was 326,000. The result of the mother's blood lead level obtained on the day of delivery was markedly elevated at 119.4 μg/dL, and the cord blood lead level in the neonate was 113.6 μg/dL. The patient was discharged on postpartum day 2 with medical follow-up, and her baby underwent a double-volume exchange transfusion. The infant's lead level fell to 12.8 μg/dL immediately after the exchange transfusion. The infant then received 5 days of chelation therapy with intravenous calcium ethylenediaminetetraacetic acid (EDTA). The infant was noted to have some episodes of mild hypotonia and mild irritability, but an otherwise normal physical and neurological exam. There was no lead line on the infant's bone x-ray. Brain stem auditory evoked response test was normal.

To further assess the association of pica with elevated lead levels during pregnancy, we performed an interim analysis of relevant data being collected as part of a continuing study to evaluate lead exposure in pregnancy. We examined the mean (geometric) lead level among 1992 pregnant women (79% Hispanic, 19% African-American) screened at King-Drew Medical Center over the last 2 years with and without a history of pica. Peripheral blood and infant cord blood lead specimens were collected in Becton-Dickinson trace-metal-free Vacutainers containing sodium heparin. Lead analyses were performed at the Environmental Toxicology Lab at the King-Drew Medical Center via atomic absorption spectrophotometer.[5] The mother underwent a measurement of bone lead to better estimate total lead exposure using a Abiomed Body Lead Analyzer as previously described.[6] In this subanalysis of 1971 individuals without a history of pica being screened at our institution, the average geometric mean lead level was 2.1 μg/dL (range, 0.1–39 μg/dL) in contrast to 3.3 μg/dL (range, 0.3–27 μg/dL) in 21 pregnant women with pica, $p = 0.003$, exclusive of this case. A more exhaustive analysis of the cohort has recently been published.[5] A summary of blood and bone lead values related to the patient and her infant are displayed in Table 1.

DISCUSSION

The use of glazed pottery is ubiquitous throughout the world. The U.S. Food and Drug Administration standards require a lead-free glaze be used to prevent lead intoxication. Our patient practiced a unique form of pica in which she would break pottery into small pieces and eat several pieces daily. This practice is apparently not uncommon among certain Mexican communities.[4] The Centers for Disease Control and Prevention recommends that the highest-risk children should be screened beginning when they are 6 months old and lower-risk children should be screened when they are 12 to 15 months old.[7] Campbell and colleagues reported that less than 55% of pediatricians routinely screened children between 9 and 36 months of age, although an additional 39% did screen if there was a history of pica or other risk factors.[8] However, guidelines for screening lead levels in asymptomatic pregnant females with pica whose children may be at risk have not been established. More than 1% of the pregnant women we screened at the time of giving birth in our inner-city population reported a history of pica during pregnancy. The elevated blood lead level noted among some of the pregnant women with pica that we screened could potentially result in high fetal/infant lead levels leading to cognitive and developmental abnormalities.[9,10,11] Our observations suggest that all pregnant women with a history of pica be screened during the prenatal period,

Table 1. Summary of Serial Blood and Bone Lead Levels in Mother and Infant

	Mother	Infant
Baseline blood lead (μg/dL)	119.4	113.6
Post exchange transfusion (μg/dL)	N/A	12.8
Post intravenous chelation blood lead (μg/dL)	N/A	<5
Post oral chelation blood lead, first course (μg/dL)	55	
Post oral chelation blood lead, second course (μg/dL)	14.9	
Baseline bone lead; tibia (PPM)	6.75 ± 8.46	N/A
Baseline bone lead, calcaneal (PPM)	29.68 ± 11.29	N/A
8-month post chelation bone lead; tibia (PPM)	3.55 ± 8.58	N/A
8-month post chelation bone lead; calcaneal (PPM)	14.08 ± 11.26	N/A

PPM, parts per million.

and at-risk infants should be screened postdelivery for lead and/or other heavy metals. Screening for high-risk mothers and their infants, such as those from diverse populations with unique cultural practices and disadvantaged socioeconomical settings, would allow early detection of potentially harmful environmental intoxicants and the timely initiation of appropriate intervention.

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