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## Elevated mercury levels in pregnant woman linked to skin cream from Mexico

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### Abstract

Mercury exposure during pregnancy can have serious health effects for a developing fetus including impacting the child's neurologic and cognitive development. Through biomonitoring in a low-income Latina population in California, we identified a patient with high levels of mercury and traced the source to face creams purchased in a pharmacy in Mexico.

### Keywords

chemicals; chemical exposure; children's health; mercury; pregnancy

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Mercury is a neurotoxicant and in 1973, the US Food and Drug Administration banned the use of mercury compounds in skin products. However, skin products containing mercury continue to be unregulated and available outside of the US.<sup>1</sup> These products are imported and/or used by certain communities in the US, including Dominican and Mexican-American women.<sup>1-4</sup> Prenatal exposure to mercury is of particular concern because the fetal central nervous system is especially vulnerable to effects of mercury exposure, which has been found to affect neurodevelopment, primarily measured through decrements in IQ. But other cognitive and behavioral deficits have also been observed,<sup>5-6</sup> including attention-deficit/

hyperactivity disorder—related behavior in children.<sup>7</sup> We present in this study the case of a pregnant patient with elevated levels of mercury in her blood and urine, as well as in her infant's umbilical cord blood, identified during a research study, and the subsequent investigation to identify the source of exposure.

## Case Report

We identified the subject during her participation in a research study to evaluate sources and exposures to environmental chemicals in pregnant women and their infants. English- and Spanish-speaking patients in their third trimester were recruited from the prenatal clinic at San Francisco General Hospital (San Francisco, CA), and consented to provide samples of maternal whole blood and umbilical cord blood, as well as environmental exposure and demographic information. After collection, Biomonitoring California, state-level biomonitoring program, analyzed the biologic samples for several environmental chemicals, including mercury.

The laboratory analysis showed that 1 participant out of 77 had unusually high levels of mercury. Her blood mercury level was 15.16  $\mu\text{g/L}$ , nearly 3 times higher than the early reporting threshold of 5.8  $\mu\text{g/L}$  used by the Centers for Disease Control and Prevention.<sup>8</sup> The concentration of mercury in umbilical cord blood was also above 5.8  $\mu\text{g/L}$  (7.43  $\mu\text{g/L}$ ). Because mercury exposure of this magnitude poses a risk to the developing central nervous system and the kidneys,<sup>9</sup> we conducted a follow-up investigation to identify the exposure source. The study obstetrician met with her during the 6-week postnatal appointment to administer a questionnaire about symptoms, potential sources of mercury exposure at home, at work, and to obtain a urine sample. During the interview, the patient did mention that she ate a considerable amount of *Mojarra* (tilapia) purchased from a local market. Fish are a common source of environmental mercury, and the tilapia, although generally considered a low mercury containing fish,<sup>9</sup> could potentially have contributed to the participant's high levels. We purchased and analyzed a sample of tilapia from the same market but we found that it had minimal levels of mercury. Participant's urine, which was collected during the postnatal interview, had a total mercury level of 40  $\mu\text{g/L}$ ; a form commonly found in batteries, disinfectants, and cosmetic creams.<sup>9</sup> Based on the results of these 2 analyses, we concluded that tilapia was not the source of mercury.

After consultation with the University of California San Francisco Pediatric Environmental Health Specialty Unit, we scheduled a home visit to further investigate the source of exposure. Using a Lumex Portable Mercury Analyzer (Ohio Lumex Co., Twinsburg, OH), the team detected mercury vapor in the participant's bathroom at concentrations above 11,000  $\text{ng/m}^3$ , particularly near 2 jars of face cream. A typical background concentration of mercury vapor is 20  $\text{ng/m}^3$ . The participant indicated that the creams had been purchased at a pharmacy in a small town in the Mexican state of Michoacan, had been enriched with folic acid, red oxide, vitamin E, and eucalyptus, among other ingredients, in both powder and oil form, and were brought into the US by a relative. The creams contained 21,000 ppm and 30,000 ppm of mercury, respectively. The Food and Drug Administration's standard for mercury in face cream products is <1 ppm. The adulterated creams were removed from the participant's home. Because the participant was lost to follow-up, we have been unable to

assess the impact of this intervention on her and her infant's mercury levels. This case of mercury poisoning emphasizes the need for maternal and child screening for heavy metals such as lead and mercury and other neurotoxicants.

## Comment

Exposure to mercury from skin creams altered outside the United States has been identified as a public health concern.<sup>1-2,10</sup> Certain groups of pregnant women from the Middle East, Asia, and Latin America may be using these products that can have harmful health effects on their developing fetus. Verbal screening of prenatal patients who may be at risk of using altered face cream can identify and potentially prevent harmful mercury exposures. Further, intervening by monitoring and preventing sale of such products in the US can provide a more upstream benefit.

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