Lessons Learned From the Crisis in Flint, Michigan Regarding the Effects of Contaminated Water on Maternal and Child Health

Melva Gale Craft-Blacksheare

ABSTRACT

The Flint, Michigan water crisis raised awareness about the dangers of lead-tainted drinking water and the role of the nurse in addressing such a crisis. Although lead exposure is dangerous for all people, research indicates that pregnant and nursing women and their infants are especially vulnerable to prenatal and postnatal lead exposure. This information is of national importance because of the aging infrastructure of American cities and the likelihood of similar problems in other locations.


Accepted October 2016

In 2016, the media spotlight on Flint, Michigan revealed an American tragedy that soon could be repeated in other cities across the nation as the crumbling water treatment and filtration systems and aging pipes that comprise the water infrastructure decline. Government hearings are being held to identify the root cause(s) and determine those individuals and agencies responsible for the contamination of the water supply of the nearly 100,000 people who live in the heart of the economically declining Midwestern rust belt. Social economists reported on Flint's demographics and its failing postindustrial economy (with 40% of the population at the poverty level) and proposed solutions to the problems uncovered. Regardless of the results of these hearings, Flint's citizens will continue to be harmed by lead toxicity for decades to come.

The Tragedy in Flint

On April 25, 2014, the residents of the city of Flint, Michigan began to use water from the Flint River to save money by terminating a contract with Detroit to use treated and filtered water from Lake Huron. Complaints about the quality of the water began the next month. A stay-at-home mother of four children was especially vocal about the decline in Flint's water quality and reported to her pediatrician that her children developed skin rashes and experienced hair loss after using Flint River water (Guyette, 2015). Other Flint residents and business owners also voiced concerns about the water, and after months of requests from citizens, local physicians, nurses, and other health professionals, the U.S. Environmental Protection Agency (EPA) finally tested Flint's water and found dangerously high lead levels that put the health of pregnant women and children at risk for short- and long-term health problems. When an independent expert on clean drinking water tested the water in Flint, he reported a lead level of 13,200 ppb, more than twice the amount at which the EPA classifies water as hazardous waste (Guyette, 2015).

When high levels of lead were discovered in Flint tap water, a Flint pediatrician and her research team conducted a review of blood lead levels (BLLs) for children younger than 5 years before 2013 and after the 2015 water source change. Incidences of elevated BLLs increased from 2.4% to 4.9% after the water source change, and some neighborhoods had increases in BLLs as high as 11.2%.
The American College of Obstetricians and Gynecologists acknowledged that adverse effects of lead exposure in children and adults are being identified at lower levels. Although the damaging effects of lead exposure are well known, research shows that the way lead is stored in the body makes prenatal and postnatal lead exposure especially dangerous for pregnant women, fetuses, lactating mothers, and nursing infants. Lead exposure during pregnancy and breastfeeding can have lasting adverse maternal and infant health effects that are distinct from exposure during other life stages, including the ability to become pregnant, to maintain a healthy pregnancy, and to have a healthy infant (Centers for Disease Control and Prevention [CDC], 2010).

Vulnerable Populations

Currently bottled water is abundant because of donations from churches, celebrities, professional nursing service organizations such as Chi Eta Phi Sorority, Inc., relief agencies, and local and national charities. However, many childbearing women, teens, and children are being tested for lead toxicity, kidney disease, Legio- nella, skin conditions, and other health problems associated with exposure to the contaminated water. Unfortunately, because of the nature of lead storage in the body, Flint's residents will face the effects of the water crisis for years to come.

The Dangers of Lead Exposure

Lead is a dangerous toxin. According to the Agency for Toxic Substances & Disease Registry (2007), the main target for lead toxicity is the nervous system in adults and children. Elevated levels of lead (>10 µg/dl) pose detrimental health effects that include delirium, seizures, stupor, coma, or death. Signs and symptoms of lead toxicity may manifest as hypertension, behavioral changes, decreased concentration, peripheral neuropathy, ataxia, tremor, headache, loss of appetite, weight loss, fatigue, muscle and joint aches, gout, nephropathy, lead colic, and anemia. In addition, symptoms of chronic low lead levels in adults include cognitive decline, hypertension, cardiovascular effects, decline in renal function, and unfavorable reproductive outcomes. The nervous systems of children and developing fetuses are most susceptible to the damaging effects of this neurotoxin (American College of Obstetricians and Gynecologists, 2012). For laboratory values and symptoms of acute and chronic lead poisoning, see Table 1.
دریافت فوری
متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات