Case report

Acute Mercury Poisoning: A Case Report

ABSTRACT

Public education on poisoning and, specifically, the potential hazardous effects of mercury are of vital importance for preventive community health. A woman presented to the ED emergency department with a three-day history of abdominal pain, diarrhea, and fever. One week previously, her daughter had brought mercury in the liquid form from the her school. She had put it on the and placed it in on the heating stove. One day later, her 14-month-old infant sister baby got developed fever and died before admission to the hospital. At the time of presentation, the woman's blood pressure was 134/87 mmHg; temperature, 40.2°C; heart rate, 105 bpm and regular; respiratory rate, 18 bpm; and O₂ saturation, 96%.

Nothing was remarkable on The results of an examination and routine laboratory tests were unremarkable. Because serum or urinary mercury levels could not be tested in the city, symptomatic chelation treatment with N-acetyl cysteine (NAC) was instituted with regard to on the basis of presumptive diagnosis and the woman’s recent medical history. At 7th day of admission, she was discharged without any sequelae or complaints. At the discharge day blood was drawn and sent. On the day of her discharge, her mercury level, which turned out was determined to be 30 μg/dL (normal reference range: 0—10 μg/dL).

BACKGROUND

Comment [A1]: The original sentence implied that you were referring to the infant’s signs; hence, I have made this revision.

Comment [A2]: Are you referring to a physical examination? Please specify.

Comment [A3]: “Serine” is an amino acid. From the context, I believe you intended to say serum instead and have accordingly made that change.

Comment [A4]: I'm afraid this part is slightly unclear in context. Did you instead mean that there was no facility in the hospital or surrounding area that was equipped to determine serum or urinary mercury levels? Please elaborate.

Comment [A5]: Please specify if this was the blood or serum level.
Mercury is silver-colored and exists in the liquid state at room temperature. It is available in inorganic and organic forms. All its compounds are toxic but differ in their routes of absorption, and clinical findings and responses to therapy. Methylmercury, the soluble form of mercury, is neurotoxic. Elemental (organic) mercury is especially hazardous for children since it is in the liquid form and can easily be found around. Acute and chronic mercury exposure represents a potential threat to community health. Mercury poisoning can occur as a result because of occupational hazards or suicide attempts.

The clinical effects of mercury poisoning depend on the form and the route of entry to the organism. Neurologic, gastrointestinal, and renal systems may be predominantly affected depending on the route of exposure.

This article presents the case of a 36-year-old woman admitted to the emergency department (ED) with nausea, vomiting, and diarrhea caused by accidental inhalation of metallic mercury.

**CASE PRESENTATION**

A woman presented to the ED with a three-day history of abdominal pain, diarrhea, and fever. One week previously, her daughter had brought mercury in the liquid form from the school without permission from her teacher. She had played with the mercury, and then placed it on the heating stove and watched its vaporization. Meanwhile, while her mother breast-fed her 14-month-old sister infant, 24 hours. One day after this event, her baby the infant got developed fever and died before admission to the hospital, without any specific diagnosis. The autopsy
report disclosed a suspected mercury poisoning, which might have led to cardiorespiratory collapse resulting in, and eventually, death of the infant.

At the time of presentation, on examination, the woman’s blood pressure was 134/87 mmHg; temperature, 40.2°C; heart rate, 105 bpm and regular; respiratory rate, 18 bpm; and O₂ saturation, 96% as determined by pulse oximetry at room temperature. Her fever resolved after administration of 1 gr paracetamol, while arterial oxygen O₂ saturation rose to 98% with supplemental oxygen.

Nothing was remarkable in her. The results of head-and-neck, respiratory, cardiovascular, and abdominal examinations were unremarkable. A neurological examination did not reveal showed absence of any tremors, paresthesia, ataxia, spasticity, or hearing and vision loss. No neuropsychiatric abnormalities were not identified.

The results of the complete blood count, and urinalysis were normal, and the levels of sodium, potassium, blood urea nitrogen (BUN), creatinine, aspartate aminotransferase (AST), alanine aminotransferase (ALT), and bilirubin levels were within the normal-reference ranges as well. Chest X-ray radiography and cranial computed tomography revealed no findings of disease.

As serum or urinary mercury levels could not be tested in the city, symptomatic chelation treatment with N-acetyl cysteine (NAC) was instituted on the basis of presumptive diagnosis and the woman’s recent history of mercury exposure. On the 7th day of admission, she was discharged without any sequelae or complaints. On the same day, blood was drawn and sent for her mercury levels, which turned out to be 30 μg/dL (hospital laboratory’s normal-reference range: 0–10 μg/dL) in accord with the hospital.
Her symptoms guided the treatment and her laboratory results took three days to be officially reported.

A week after the discharge, the patient revisited the ED due to recurrent abdominal pain. The results of a physical examination and laboratory tests were unremarkable, and she was discharged after a 24-hour observation. A follow-up was scheduled for one week later. In the follow-up visit, the patient was asymptomatic and without any clinical findings. Therefore, NAC treatment was discontinued after 14 treatment days from the time of her first discharge. The other children did not exhibit any manifestations of the disease.

CONCLUSION

Children are often attracted to elemental mercury with its bright shiny gray appearance. The compound element has a short half-life (two months) in the blood due to rapid distribution into body compartments. Half life in the body is only two months. Almost all of the absorbed amount is excreted via urination.

Mercury is used for the manufacturing of industrial chemicals, paints, explosives, batteries, thermometers, sphygmomanometers, electronic instruments, etc. Different mercury compounds are used as antiseptic and diuretic agents in medicine. It is also an ingredient in the drug thiomersal, which is used to prevent contamination of vaccines.

Acute inhalations of mercury vapors can cause pneumonia, adult respiratory distress syndrome, progressive pulmonary fibrosis, and death. Further, elemental (metallic) mercury can readily pass into systemic circulation via alveoli present in mercury vapor or directly through the skin. It is also known to pass directly from nursing mothers to infants via breast milk.

Comment [A11]: This sentence is slightly unclear. You have already mentioned earlier that she was given symptomatic treatment. Did you mean that she was asked to continue the same medication after discharge?

Further, in the previous sentence, you say that on the day of the discharge, the blood sample was taken and her mercury level determined. So the statement that her results took three days to be reported sounds contradictory. Please clarify so that I can suggest a suitable revision.

Comment [A12]: The time period was not very clear in the original sentence. Please check if the revision captures what you meant. If not, please return with a clarification and I will be happy to offer an alternative.

Comment [A13]: You have mentioned only one child other than the infant who died. If you are referring to this child, please replace this phrase with “other child.”

If the woman had more children, please mention so early on in the case report so that this sentence does not confuse readers.

Comment [A14]: Since you are not referring to any particular disease but just toxicity, I suggest that you replace this phrase with “signs of mercury poisoning.”
In the present case, Findings in the patient’s recent history of mercury exposure played a critical role in the diagnosis in the present case. Inquiry for additional acid, alkali, arsenic, phosphorus or iron ingestion did not yield any suspicious finding. The history of exposure to mercury exposure, gastrointestinal symptoms, and suspicious death of the breast-fed baby-infant led us to the presumptive diagnosis of acute mercury poisoning. It can be postulated that in the present case, neurotoxicity in the woman was prevented by the NAC treatment which was instituted empirically based on clinical symptoms and history although blood and urine mercury levels were not determined at the time of admission.

Death of the a previously healthy baby in 24 hours prompts consideration of necrotizing bronchitis, pneumonia, or respiratory distress syndrome. Inhalation of mercury by the baby infant in this case was thought to be the main reason cause of death.

Initial treatment. The immediate precautionary measure is to keeping the isolate the patient away from the contaminated environment and the toxic agents. NAC is used for chelation of mercury, due to lack in the absence of other treatment options. Basically it NAC binds mercury by through its cysteine groups. The Other mercury-chelating drugs commonly used worldwide
application are dimercaprol or British anti-Lewisite (BAL), dimercaprosuccinic acid (DMSA), and 2,3-Di(mercapropane-1-sulphfonate (DMPS) British Anti Lewisite (BAL) (2.5 mg/kg) is also commonly used in the treatment [1,8].

This case report emphasizes the importance of public education on poisoning and specifically, the potential hazardous effects of mercury for preventive community health.

REFERENCES


