Case report

Acute Mercury Poisoning: A Case Report

ABSTRACT

Public education on poisoning and, specifically, the potential hazardous ~~of~~ effects of mercury ~~are of vital~~ is an ~~importance~~ important aspect ~~for~~ of preventive community health. A woman presented to the ~~ED~~ emergency department with a three-day history of abdominal pain, diarrhea, and fever. One week ~~ago~~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 ~~Her~~ blood pressure was 134/87 mmHg; temperature, 40.2°C; heart rate, 105 bpm ~~and regular~~; respirat~~ion~~ory rate, 18 bpm; and O_2 saturation, 96%. ~~Nothing was remarkable on~~ The results of an examination and routine laboratory tests were unremarkable. ~~As~~ Because ~~serine~~ 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~~ On the 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 ~~for~~ mercury levels ~~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. ~~Mercury~~ It is available in inorganic and organic forms. All its compounds ~~of mercury~~ are toxic but differ in their routes of absorption~~,~~ and clinical ~~findings~~effects~~,~~; ~~and responses to therapy~~therapeutic approaches for treating toxicity caused by them also differ. Methylmercury, ~~the~~ a 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 [1]. Acute and chronic mercury exposure ~~represents~~ is 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 ~~are~~ may be predominantly affected depending on the route of exposure.

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

CASE PRESENTATION

A woman presented to the ED with a three-day history of abdominal pain, diarrhea, and fever. One week ~~ago~~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 ~~put~~ 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

Comment [A6]: Please check if these changes convey your intended meaning. The compounds themselves cannot have *findings*, so I have used "effects" instead. Also they cannot have responses to therapy, so I have assumed you are talking about therapeutic approaches differing according to the type of compound.

Comment [A7]: The original phrase appeared contradictory. Elemental mercury is mercury in uncombined form, whereas organic mercury would refer to an organic compound of mercury. Since you've referred to the liquid form, I assume you're referring to the elemental uncombined form.

Comment [A8]: This phrase implies that mercury in its liquid state naturally occurs in a home environment, which is not true. Did you instead mean that liquid mercury is found in common household items like fluorescent light bulbs and thermometers?

report ~~disclosed a suspected~~ suggested mercury poisoning, which might have led to cardiorespiratory collapse ~~resulting in~~ and, eventually, death ~~of the infant~~.

At the time of presentation, ~~On examination, her~~ the woman's blood pressure was 134/87 mmHg; temperature, 40.2°C; heart rate, 105 bpm ~~and regular~~; respirat~~ion~~ory rate, 18 bpm; and O_2 saturation, 96% ~~with~~ as determined by pulse oximetry at room temperature. Her fever ~~relieved~~ resolved after administration of 1 g~~r~~ paracetamol, while arterial ~~oxygen~~ O_2 saturation rose to 98% with supplemental oxygen.

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

The results of the ~~C~~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~~ signs of disease.

~~As~~ Because ~~serine~~ 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 history of mercury exposure. ~~At~~ On the 7th day of admission, she was discharged without any sequelae or complaints. ~~In~~ On the same day, ~~blood was drawn and sent for~~ her mercury levels ~~which turned out~~ was determined to be 30 μg/dL (hospital laboratory's ~~normal~~ reference range: 0–10 μg/dL ~~in accord with the hospital~~

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Comment [A9]: Please refer to comment A4.

Comment [A10]: Please remember to specify if this is the blood or serum level.

~~laboratory reference~~). 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~~ because of recurrent abdominal pain. The results of a ~~P~~physical examination and laboratory tests ~~results~~ were unremarkable, and she was discharged after a 24-hour observation. A ~~F~~follow-up was scheduled for one week later. In the follow-up visit, the patient was asymptomatic and ~~without any~~ no clinical ~~finding~~signs were noted. Therefore, NAC treatment was ~~terminated~~ discontinued after 14 ~~treatment~~ days from the time of her first discharge. The other children did not exhibit any manifestations of the disease.

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 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."

CONCLUSION

Children are ~~always~~ often attracted ~~to~~ by elemental mercury ~~with~~ because of its ~~bright~~ shiny gray appearance [2]. The ~~compound~~ element has a short half-life (two months) in the blood ~~due to~~ since it is ~~rapid distribution~~ distributed rapidly ~~into~~ among body compartments. ~~Half-life in the body is only two months.~~ Almost all ~~of~~ the absorbed amount is excreted ~~via~~ through urination [3]. Mercury is used for the manufactur~~ing~~e of industrial chemicals, paints, explosives, batteries, thermometers, sphygmomanometers, electronic instruments, etc. ~~Different m~~Mercury compounds are used as antiseptic and diuretic agents in medicine [1]. It is also an ingredient in the drug ~~T~~thiomersal, which is used to prevent contamination of vaccines.

Acute inhalation~~s~~ of mercury vapors can cause pneumonia, adult respiratory distress syndrome, progressive pulmonary fibrosis, and death. ~~Also~~ 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 [4]. In the

present case, ~~P~~predominance of gastrointestinal symptoms and ~~historical findings~~ recent history of mercury exposure suggested intoxication with elemental mercury ~~in the present case~~.

~~All kinds of~~ Various neurological ~~findings~~ manifestations can ~~be seen~~ occur in chronic mercury exposure. Some effects of high-dose mercury inhalation are shown ~~on~~ in Table 1 [4,5]. A recently published recommendation ~~guideline~~ stresses that ~~"~~"if the elemental mercury was recently heated (e.g., from stove top, oven, furnace) in an enclosed area, all people within the exposure area should be evaluated at a healthcare facility due to the high risk of toxicity (Grade C)~~"~~" [1].

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 ~~H~~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~~ that 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 [7]. Inhalation of mercury by the ~~baby~~ infant in this case ~~can be~~ 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 agent~~s~~. 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 [1]. ~~The~~ Other mercury-chelating drugs commonly ~~with~~ used worldwide

Comment [A15]: "Historical findings" is not a very standard phrase. Hence, I have made this revision.

Comment [A16]: I have not made any changes to this portion since it is a direct quote from a referenced paper.

Comment [A17]: I'm not altogether sure what you mean by "inquiry for…" Did you question the patient if she had ingested any of the items mentioned? Or were tests performed to determine these levels? Please elaborate.

Comment [A18]: This is a repetition of what you've already said at a couple of previous instances. Please review if you need to omit one of the previous mentions.

Comment [A19]: You have not cited reference [6] anywhere in the text. Please correct this discrepancy.

~~application~~ are dimercaprol or British anti-Lewisite (BAL), dimercaprosuccinic acid (DMSA), and 2,3-~~D~~dimercapropropane-1-sul~~ph~~fonate (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

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3. Fischbach FT: *A manual of laboratory & diagnostic testing*. 4th edition. Philadelphia: J.B. Lippincott Company; 1992:214-6.
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Comment [A20]: Please add the year of publication.

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Comment [A21]: Please add the volume number.

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