

Catching the Silent Killer: A Case of Mercury Vapor Striking Under the Radar

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Introduction:

Mercury vapor exposure is a serious occupational hazard, especially in industrial settings. Elemental mercury, when inhaled, can lead to significant toxicity due to its ability to be readily absorbed by the lungs and its lack of odor, which provides no warning of hazardous concentrations.

Case Description:

A 26 year old man who arrived at the emergency room, with complaints of progressive dyspnea, dry cough and headache for the last 3 weeks, after being exposed to mercury vapor at his factory workplace presented with a moderate-grade fever (102.5° F) with chills. Physical examination was notable for labored breathing, mild substernal retractions, and a generalized maculopapular rash on the extremities and body. A chest radiograph revealed that mercury was distributed in a vascular pattern bilaterally in the lungs with hyper-opaque deposits more pronounced near the base. Toxicological analysis showed a high level of mercury in both urine and serum – 24-hour urine levels of mercury was >1700µg/L (normal < 20 µg/L) and serum level was >250 µg/L.

Diagnosis:

A diagnosis of Mercury embolism was made. Patient was provided symptomatic management, supplemental oxygen by bag-valve mask was administered, and chelation therapy with Dimercaprol (2,3-Dimercaptopropanol/BAL) was initiated as per guidelines.



Discussion:

The adverse effects of mercury exposure depend on the type of exposure, as well as the dose and rate of exposure. Inhalation of mercury vapor is the primary route of exposure to elemental mercury.¹ Mercury vapor has no smell, therefore there are no warning signs when hazardous concentrations are inhaled. Up to 80% of inhaled mercury vapor is absorbed by the lungs, and since mercury vapor is heavier than air it usually accumulates in poorly ventilated or low-lying areas of the lungs.² Elemental (metallic) mercury has several applications in the electrical, chemical & mining industries. Respiratory symptoms include corrosive bronchitis with fever, chills and dyspnea, and can ultimately progress to pulmonary edema or fibrosis. Renal dysfunction, visual disturbances, and central nervous system damage leading to neuropsychiatric abnormalities and intention tremors may also occur.¹

Takeaway Points:

1. Consider Mercury Vapor Exposure in your Ddx - Industrial workers with unexplained respiratory symptoms.
2. Early chelation is essential to prevent further neuro & renal damage.
3. Counsel pts. on the importance of PPE and occupational safety reforms.

References:

1. Medical Management Guidelines for Mercury. Centers for Disease Control and Prevention. <https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=106&toxid=24>.
2. Smiechowicz J, Skoczynska A, Nieckula-Szwarc A, Kulpa K, Kübler A. Occupational Mercury vapour poisoning with a respiratory failure, pneumomediastinum and severe quadriplegia. SAGE Open Medical Case Reports. 2017;5. doi:10.1177/2050313x17695472