

Fatality from Methyl Bromide, a Soil Fumigant: Lessons for Complex Decontaminations

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Introduction

Methyl bromide (MeBr) is a soil fumigant which can cause multiple organ dysfunction and rapid death in high-dose exposures. We report a case of rapidly fatal pulmonary edema due to MeBr poisoning from an unusual, possibly iatrogenic exposure. This case offers new lessons for complex or high-risk decontamination procedures.

Case report

A 56-year old industrial worker became the victim of an occupational accident in which MeBr powder scattered onto his skin and clothes from a storage canister. His prior medical history was significant for 4-vessel coronary artery bypass grafts (CABG) and multiple stents.

On-site first aid was initiated. He was disrobed completely and sprayed copiously with water, during which he inadvertently inhaled aerosolized MeBr dust. On arrival to the ED, he was in mild distress due to burns and tachypnea, and he complained of burning pain in the legs. Vital signs on arrival were: temp 98.1 f, BP 152/85, pulse 90/min, and respirations 20/min, room-air oxygen saturation 100%. Physical examination revealed clear lungs and erythema of the anterior thighs and left inguinal crease, consistent with superficial chemical burns, without blisters or bullae.

The patient's tachypnea worsened rapidly. Within 2 hours of arrival, mechanical ventilation was required to support respirations. Serial chest radiographs demonstrated bilateral interstitial infiltrates consistent with acute lung injury. Bronchoscopy was performed and no occlusions were noted in the upper airways. About 5 hours after initial presentation, the patient was noted to have inferior ST-segment elevations and hypotension; emergent cardiac catheterization was done and 2 stents placed in the occluded right coronary artery. The patient was admitted to the intensive care unit, where his condition continued to worsen. He experienced terminal cardiac arrest which was unresponsive to intensive resuscitation, and expired 13 hours after the mishap with a canister of methyl bromide powder.

Discussion

MeBr is a potent fumigant compound in rare use today. MeBr has caustic effects and disrupts sulfhydryl groups in numerous enzymes. Most reported deaths were due to either inhalational or massive dermal exposure; ours is an unusual case of inhalational toxicity secondary to routine decontamination procedures for a minor dermal exposure. Acute lung injury and pneumonitis are well described sequelae of poisoning, and in this patient proved to be fatal in combination with an acute coronary syndrome.

Conclusion

This case highlights the importance of respiratory protection for patients and staff when there is a risk of aerosolization of inhalational hazards during dermal irrigation/decontamination.

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