

Occupational Exposure to Methyl Iodide

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Little is known about the effects of methyl iodide (MI) on the skin after short-term accidental cutaneous exposure because this type of exposure to MI has rarely been reported. In the present case, asymptomatic vesicles developed within 24 hours of exposure, an acute hemorrhagic eruption developed several days later, and an erythematous edematous eruption and large bullae developed several days after the hemorrhagic eruption. This sequence of findings was remarkably similar to the most recently reported case of short-term accidental MI exposure, and we believe that the findings described and the time course of the findings may be a reproducible phenomenon following this type of cutaneous exposure to MI.

OCCUPATIONAL EXPOSURE to methyl iodide (MI) is uncommonly reported. We describe a case of accidental occupational exposure that was followed by early asymptomatic vesiculation and a late intense hemorrhagic dermatitis that healed uneventfully and without sequelae. This is remarkably similar to the most recently reported case of MI exposure and may indicate that this is a predictable sequence of events following brief MI exposure.

Case Presentation

A 48-year-old male laboratory worker presented to our clinic for evaluation of an eruption on both hands. Seven days prior to presentation, he had spilled MI of 99% purity on his hands while removing the lid from a container of the liquid. He was wearing disposable nitrile gloves at the time of the spill. He immediately removed the gloves, washed his hands with soap and water, and rinsed his hands for 10 minutes. There were no symptoms at that time.

Approximately 12 hours later, an asymptomatic vesicle was noted on the left index finger where maximal contact between the MI and nitrile glove had occurred. Twelve hours after the development of that blister, a second asymptomatic vesicle was noted on the lateral aspect of the right hand, which was the other site of maximal contact between the MI and the nitrile glove.

No symptoms or additional findings developed until approximately day 5, when an intense hemorrhagic pruritic eruption developed on the skin surrounding the original vesicle on the left index finger. An edematous erythematous eruption also began at other sites of exposure. The original vesicles enlarged into bullae, and several additional surrounding smaller vesicles developed.

Examination on day 7 revealed large and tense bullae surrounded by erythematous-to-hemorrhagic edematous plaques. The bullae were localized to the second and third digits of the left hand and to the lateral aspect of the right hand (Figs 1 and 2). There were no systemic or neurologic symptoms or findings at any time.

The hemorrhagic nature of the eruption on the left index finger raised a suspicion of tissue necrosis. The patient was referred for emergent evaluation by the plastic surgery service. No soft-tissue findings, such as gas



Figure 1. Hemorrhagic eruption on patient's left hand, involving primarily the index finger, 7 days after accidental exposure to methyl iodide.

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Figure 2. Tense blister on erythematous edematous skin on lateral aspect of patient's right hand 7 days after accidental exposure to methyl iodide.

bubbles, were noted by plain radiography, and the surgeons felt that no surgical intervention was necessary.

Therapy with clobetasol ointment and mupirocin ointment was initiated. The bullae ruptured over the next several days, and the eruption cleared over the next 2 weeks, without scarring or any residual sequelae.

Discussion

We present a patient with short-term accidental exposure to MI while wearing a nitrile glove. MI is classified as a monohalomethane, along with methyl bromide and methyl chloride. MI is an intermediate encountered most often in the manufacturing of pharmaceuticals and some pesticides, as well as in the field of microscopy.^{1,2}

The literature has examples of dermatitis and neurotoxicity from MI and from methyl bromide inhalation and skin exposure.^{3–6} The sequence of events and clinical findings in the presently reported case are remarkably similar to those of a recently reported case of short-term accidental cutaneous MI exposure, in which vesicles developed within 24 hours of exposure, were followed after several days by an intense hemorrhagic eruption, and culminated with larger bullae several days later.³ Healing was uneventful in both cases, and there were no scars or other residual effects.

MI, as an alkylating agent, is a significant human toxin and has demonstrated activity as a mutagen in animals.⁷ Neurotoxicity (both acute and chronic) following significant exposures to MI has been reported. Acutely, neurotoxicity may present with irritability, visual disturbances, and lethargy that may progress to coma and death. If there is recovery from the acute toxicity, there may be long-term sequelae, such as loss of cognitive ability, psychosis, and emotional lability.⁸ Because the amount

of cutaneous exposure that could lead to neurotoxicity or mutagenicity is unknown, patch testing was not undertaken in our patient, and to our knowledge, patch testing has not been undertaken in any such other patients. Although we believe that immediate and delayed irritant/toxic effects are the mechanisms of tissue injury, in the absence of patch testing, the possibility that both our patient and the previously reported patient were sensitized to MI cannot be excluded.

Appropriate protective equipment is important when working with MI because it has both cutaneous and systemic toxicity. Based on data available from glove manufacturers, the following gloves provide excellent protection: Barrier Chemical Protective Gloves, from Ansell (Ansell Healthcare, Red Bank, NJ)⁹; Style 890 Viton over butyl rubber, from Best Gloves (Best Manufacturing Co, Menlo, GA)¹⁰; Cobra F-466 fluoroelastomer gloves, from MAPA (MAPA Spontex Inc, Columbia, TN)¹¹; and Viton gloves F-101 and F-124, from North Safety (North Safety Products, Cranston, RI).¹²

The remarkable similarity of the two cases of short-term accidental exposure to small quantities of MI indicates that this sequence of events may be predictable after short-term cutaneous exposure to MI. Although vigilant observation for evidence of progressive tissue damage after cutaneous MI exposure is prudent, knowledge of the reported sequence of events that follow MI exposure may allow patients to be counseled about the events that are to be expected after an accidental exposure. It may also allow a degree of reassurance, both for the clinician and the patient, that uneventful healing after very brief exposures can be expected when the condition is treated with topical steroids.

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