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Safety & Health Assessment & Research for Prevention

Research Findings

Toxic Inhalation Injury

Toxic inhalation of sodium metabisulphite by-products from a shipping container

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Overview

To the authors' knowledge, this is the first reported case of an inhalation injury from sodium metabisulphite (SMBS) in a logistics worker who entered a shipping container. Exposure to fumigants, pesticides, and cargo off-gas of volatile organic compounds have been previously reported in logistics workers.

Bulk cargo of 100 bags (1000 kg each) of SMBS was removed from the shipping container two days before it was delivered empty to a warehouse. At the warehouse, a logistics worker entered the empty container for inspection and was exposed to an unknown amount of spilt residual SMBS and SMBS decomposition products, including sulphur dioxide.

This case was identified through SHARP's occupational respiratory disease surveillance system, which identifies toxic inhalation injuries in Washington workers.

Key Findings

- A previously healthy logistics supervisor in their 30's was acutely exposed to sodium metabisulphite (SMBS) and its thermal degradation by-products during a routine inspection of a shipping container.
  - Upon entering the empty container, the injured worker saw white solid particles on the floor, smelled a pungent 'sewer' odor, and experienced sudden onset of acute eye irritation, cough, and shortness of breath.
  - The injured worker was initially hospitalized for three days. Diagnoses included chemical pneumonitis and subsequent severe reactive airway dysfunction syndrome (RADS). Three and a half years later, lung function had gradually improved but significant symptoms remained. The injured worker did not return to work.
- SMBS readily decomposes to sulphur oxides in the presence of heat and water, an environment that could have been created through condensation in the closed empty metal container. SMBS is thought to induce injury through an irritant mechanism. Fatal SMBS exposures have been reported in shrimp trawlers.
- This case study highlights an inhalation hazard associated with shipping containers in a North American port.

Impact

Research is needed to characterize the prevalence of toxic inhalation injury in logistics workers. Employers should educate and train workers on the risk of toxic inhalation and encourage incident reporting. The safety and health hierarchy of controls is needed to prevent serious inhalation injuries in the shipping industry.

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Research for Safe Work

The SHARP Program at the Washington State Department of Labor & Industries partners with business and labor to develop sensible, effective solutions to identify and eliminate industry-wide hazards. Learn more at: lni.wa.gov/safety-health/safety-research/about-sharp

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