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CASE REPORT

Nosocomial Poisoning Associated with Emergency Department Treatment of Organophosphate Toxicity—Georgia, 2000

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ABSTRACT

Emergency department (ED) staff caring for patients contaminated with toxic chemicals are at risk for developing toxicity from secondary contamination. This report describes three cases of occupational illnesses associated with organophosphate toxicity caused by exposure to a contaminated patient and underscores the importance of using personal protection equipment (PPE) and establishing and following decontamination procedures in EDs and other areas of acute care hospitals.

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CASE REPORTS

Patient 1

On April 11, a 40-year-old man intentionally ingested approximately 110 g of a veterinary insecticide concentrate. The insecticide contained 73% naphthalene, xylene, and surfactant, and 11.6% phosmet. On clinical examination at a local hospital ED approximately 20 minutes after the ingestion, the patient had profuse oral and bronchial secretions, vomiting, bronchospasm, and respiratory distress. He was intubated for airway management and ventilation. To control secretions, he received 4 g pralidoxime and 22 mg atropine during the next 24 hours. The patient improved over a 9-day period and was transferred to a psychiatric facility.

The patient was brought to the ED by a friend, not by emergency medical services, and the friend developed symptoms that required treatment. ED personnel exposed to the patient had symptoms within an hour of his arrival. The staff noted a chemical odor in the ED and contacted the regional poison center, which recommended decontaminating the patient's skin and placing gastric contents in a sealed container to minimize evaporation; however, no decontamination was performed.

Health-Care Worker 1

A 45-year-old ED nursing assistant providing care to patient 1 developed respiratory distress, profuse secretions, emesis, diaphoresis, and weakness. She had contact with the patient's skin, respiratory secretions, and emesis. She was admitted to the hospital and required intubation for 24 hours to support respiration. After medical management and serial doses of atropine and pralidoxime for 7 days, her respiratory function improved, and she was discharged after 9 days of hospitalization.

Health-Care Worker 2

A 32-year-old ED nurse had diaphoresis, confusion, hypersalivation, nausea, and abdominal cramps while caring for patient 1. Although she did not have skin contact with his secretions or emesis, she had shared his breathing space. After treatment with 10 mg of atropine and pralidoxime over the next 12 hours, her symptoms resolved.

Health-Care Worker 3

A 56-year-old nurse providing care for patient 1 was admitted to the hospital with dyspnea, confusion, and headache. Although she did not have skin contact with secretions or emesis from patient 1, she had shared his breathing space. She was given 6 mg of atropine without relief of the dyspnea. As a possible result of excessive atropine, she experienced hallucinations. On recommendation of the regional poison center, she received intravenous lorazepam and was observed until the episode resolved. She improved overnight and was discharged.

EDITORIAL NOTE

During the incident in this report, health-care workers were exposed to a patient contaminated with an organophosphate insecticide. These health-care workers were not wearing appropriate respiratory or skin protective equipment while caring for the patient. As a result, three health-care workers developed symptoms consistent with organophosphate intoxication and required treatment. This was the third episode reported during 2000 to the Georgia Poison Center of nosocomial poisoning of ED staff involved in the care of patients who had intentionally ingested a concentrated organophosphate mixed with xylene and other hydrocarbon solvents. Similar incidents have occurred elsewhere (1). During 1987–1998, the National Institute for Occupational Safety and Health identified 46 health-care workers who had acute pesticide-related illness after providing care to a pesticide-contaminated patient (G. Calvert, CDC, personal communication, 2000).

The Joint Commission on Accreditation of Healthcare Organizations requires hospitals to have a plan to manage contaminated patients;[2] however, these recommendations do not include a plan to protect health-care workers caring for contaminated patients. During 1996–1998, surveys of hospitals in Georgia and at level 1 trauma centers nationally indicated that few acute care hospitals had trained staff, equipment, and procedures to safely care for contaminated patients.[3–5]

Depending on the extent of the contamination, health-care workers caring for chemically contaminated patients should use level C protection (i.e., full face mask and powered/nonpowered canister/cartridge filtration respirator) or level B protection (i.e., supplied air respirator or self-contained breathing apparatus).[6] The type of canister/cartridge should be appropriate to the agent; if the agent cannot be identified, an organic vapor/HEPA filter is recommended.[6] To prevent dermal absorption, chemical barrier protection appropriate to the contaminant is needed; latex medical gloves are of little protection against many chemicals. In addition to the need for

surface decontamination of patients, body fluids also must be contained to prevent dermal and inhalational exposure. To limit distant spread of the contaminant, the EDs ventilation exhaust should be directed away from the hospital's main ventilation system.

EDs may have to care for persons contaminated with chemicals resulting from self-inflicted contamination, industrial incidents, and terrorist events.[7] To protect health-care workers caring for these patients, EDs should adhere to existing guidelines[6,8,9] and decontamination protocols, train staff in the use of PPE, and maintain adequate quantities of antidotes.[10] If sufficient quantities of antidote are not available, the National Pharmaceutical Stockpile at CDC maintains a mechanism to procure and deliver large quantities of pharmaceuticals to state health departments within 12 hours. Coordination among health-care facilities, poison centers, and state and local health departments could provide surveillance of a chemical agent release, facilitate the expeditious procurement of supplies from outside sources, protect health-care workers, and inform the public about contaminants.

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