

MMWRTM
**MORBIDITY AND MORTALITY
WEEKLY REPORT**

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**Pesticide-Related Illnesses Associated with
the Use of a Plant Growth Regulator — Italy, 2001**

During January–February 2001, eight cases of acute illness in the county of Ragusa, Italy, were reported to the Italian National Institute for Health (INIH) by the Milan Poison Control Center (MPCC) and were attributed to exposure to Dormex[®], a plant growth regulator with hydrogen cyanamide as the active ingredient. These cases were identified during a pilot project for acute pesticide-related illness surveillance. Subsequent active case finding at health-care clinics by the Ragusa Occupational Health Unit identified six additional cases. MPCC identified nine cases in other areas of Italy. Of the 23 cases of acute illness, 22 resulted from occupational exposure during mixing and/or applying of Dormex[®], and one was from unintentional ingestion. This report summarizes the investigation of these cases, which implicates a pesticide as the causative agent and demonstrates the usefulness of surveillance for detecting pesticide-related illnesses.

All 22 workers were male with a median age of 41 years (range: 16–76 years). It is not known whether personal protection equipment was used. Eighteen of the workers reported dermatologic manifestations, including macular or papular rash (11), erythema/hyperemia (nine), pruritus (two), and caustic burns to the hand (two). Two workers reported eye irritation. Fourteen workers had systemic signs and/or symptoms characteristic of adverse effects of the active ingredient, including tachycardia (four), weakness (four), dizziness (four), palpitations (three), headache (three), vomiting and/or nausea (three), dyspnea (three), and hypotension (one). Of 21 persons initially treated in an emergency department, 12 (52%) were hospitalized; one person was treated by a local physician. Thirteen patients had low severity effects (i.e., minimal effects that rapidly resolved), and nine had moderate severity effects (i.e., nonlife threatening effects that are more pronounced, prolonged, or of a systemic nature) (CDC, unpublished data, 2001).

The nonoccupational case occurred in a man aged 44 years who unintentionally ingested the product that had been placed in a plastic water bottle in the refrigerator. He became seriously ill with third degree shock, coma, miosis, and hepatic necrosis and required care in an intensive care unit.

In May 2001, INIH notified the Italian Ministry of Health (IMH) about the outbreak. IMH, which acts as the regulatory agency for pesticides and agricultural products, suspended use of the product in Italy.

Pesticide-Related Illnesses — Continued

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Editorial Note: This report describes the adverse health effects of hydrogen cyanamide, the active ingredient in Dormex[®], which is a plant growth regulator designed to stimulate more uniform budbreak following dormancy, resulting in more uniform flowering and maturity at harvest. Dormex[®] is applied by nebulization with an atomizer. Adverse health effects from contact with hydrogen cyanamide include severe irritation and ulceration of the eyes, skin, and respiratory tract (1,2). It also inhibits aldehyde dehydrogenase and can produce the acetaldehyde syndrome (e.g., vomiting, parasympathetic hyperactivity, dyspnea, hypotension, tachycardia, and confusion) when exposure coincides with alcohol use (2).

Hydrogen cyanamide is classified in the European Union as “toxic” if swallowed, “harmful” in contact with skin, “irritating” to eyes and skin, and capable of producing sensitization after skin contact. The U.S. Environmental Protection Agency (EPA) places both the active ingredient (hydrogen cyanamide) and the product (Dormex[®]), which contains 50% hydrogen cyanamide, into the acute toxicity category I (danger)*. The Dormex[®] product label provided by the manufacturer to EPA indicates that the following personal protective equipment must be used by applicators and other handlers of this product: chemical-resistant suit, chemical-resistant gloves, chemical-resistant footwear, eye and face protection, and a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides or a canister approved for pesticides.

On the basis of experimental trials of the product, Dormex[®] was classified in Italy as “harmful” if swallowed, “harmful” in contact with the skin, “irritating” to the eyes and skin, capable of causing serious damage to the eyes, and of causing sensitization after skin contact. This corresponds to EPA acute toxicity category II. The product sold in Italy was for use only by licensed applicators and required wearing suitable protective clothing, gloves, and eye and face protection.

Since 1981, only five cases of acute pesticide-related illness associated with hydrogen cyanamide have been identified in the United States (CDC, unpublished data, 2001). All five patients were exposed in California. No cases were identified in the other seven states with acute pesticide-related illness surveillance programs or by the Toxic Exposure Surveillance System, which collects poisoning reports submitted by approximately 85% of U.S. poison control centers. The low number of U.S. cases compared with Italy may be related to greater precautions required by the label of the U.S.-distributed product.

The findings in this report are subject to at least two limitations. First, because active surveillance for acute pesticide-related illness cases was conducted in Ragusa only, patients who sought health care in other parts of Italy may have been missed. Second, lack of detailed information on the events surrounding exposure may have precluded identification of additional risk factors for hydrogen cyanamide-related illness.

*EPA classifies all pesticide products into one of four acute toxicity categories based on established criteria (40 CFR Part 156). Pesticides with the greatest toxicity are in category I, and those with the least are in category IV.

Pesticide-Related Illnesses — Continued

Although use of Dormex® in Italy began in 2000, only three cases of acute illness associated with this product were identified by MPCC in 2000 (i.e., before establishment of the pilot surveillance program). One occurred in Ragusa and the other two were from other regions in southern Italy. These data suggest that fewer cases occurred in 2000 compared with 2001. Because emergency department medical records in Ragusa for 2000 were not available to the Occupational Health Unit, the total number of Ragusa cases that occurred in 2000 is unknown. The establishment of the pilot surveillance system in January 2001 probably enabled the detection of this outbreak through active case-finding and the use of a standardized form. Ragusa was selected for this pilot program, in part, because it is an area characterized by greenhouse cultivation of fruits and vegetables with extensive use of pesticides and because of heightened awareness of pesticide-related illnesses by the Ragusa Occupational Health Unit.

These findings demonstrate the usefulness of surveillance for detecting emerging pesticide problems (3). In addition, this outbreak suggests the need for international uniformity in both the acute toxicity category assigned to a pesticide and in the detailed recommendations and requirements provided on the pesticide label.

References

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Vaccination Coverage Among Children Enrolled in Head Start Programs and Licensed Child Care Centers and Entering School — United States and Selected Reporting Areas, 1999–2000 School Year

Undervaccinated children enrolled in child care centers (1) and schools (2) are vulnerable to outbreaks of vaccine-preventable disease. One of the national health objectives for 2010 is to maintain $\geq 95\%$ vaccination coverage among children attending licensed child care centers and kindergarten through postsecondary school (objective 14-23) (3). To identify children who have not been vaccinated in compliance with state law, all states, five large cities (Chicago, Houston, New York, Philadelphia, and San Antonio), and eight territories conduct annual vaccination assessment surveys of coverage with basic vaccines among children enrolled in the Head Start program, enrolled in licensed child care centers, and entering kindergarten or first grade. These survey results are aggregated and analyzed by CDC to estimate national vaccination coverage. This report summarizes estimated coverage with the basic vaccines: ≥ 3 doses of poliovirus vaccine, ≥ 3 tetanus containing doses (diphtheria and tetanus toxoids and acellular pertussis vaccine [DTaP]), diphtheria and tetanus toxoids (DT), or tetanus toxoids (Td), and 1 dose each of measles, mumps, and rubella vaccines for the September 1999–June 2000 school year. Results indicate that among reporting programs, the mean coverage for all vaccines was $\geq 95\%$ for the surveyed population. However, coverage varied from state to state, and approximately 30% of states did not submit reports. High rates of vaccination coverage must be maintained to prevent transmission of vaccine-preventable disease. States should conduct yearly assessments to maintain these rates among preschool- and school-aged children.