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Foodborne Botulism Associated With Home-Canned Bamboo Shoots — Thailand, 1998

On April 13, 1998, the Field Epidemiology Training Program in the Thailand Ministry of Public Health (TMPH) was informed of six persons with sudden onset of cranial nerve palsies suggestive of botulism who were admitted to a provincial hospital in northern Thailand. To determine the cause of the cluster, TMPH initiated an investigation on April 14. This report summarizes the results of the investigation, which indicate that the outbreak was caused by foodborne botulism from home-canned bamboo shoots.

Of the six patients, five resided in one village (village A), and the other patient resided in another village (village B). A case was defined as at least three symptoms (ptosis, dysphagia, dysarthria, dysphonia, dry mouth, symmetrical paralysis, diarrhea, or vomiting) that developed in a resident of village A or B during April 8–17. TMPH reviewed medical records and interviewed patients in the provincial hospital; seven additional cases were identified. Twelve (92%) case-patients resided in village A; nine (69%) were hospitalized. The median age was 44 years (range: 38–68 years), and nine were women. In the 13 case-patients, symptoms included dysphagia (85%), dry mouth (62%), vomiting (54%), dysphonia (54%), diarrhea (38%), symmetrical paralysis (31%), dysarthria (31%), and ptosis (23%). Four required mechanical ventilation. Two (15%) patients died; both were women, ages 46 and 68 years. Electromyography of two ill persons showed an incremental response to rapid repetitive stimulation consistent with botulism (*1*).

TMPH interviewed 11 case-patients and the family members of the two who died. All 13 ill persons had eaten home-canned bamboo shoots. No other common food was identified. Sixty-six healthy controls were selected among residents of village A and B who were preparing foods on April 16 for the burial services of the two decedents. All controls were women; 38 (58%) resided in village B. Four (6%) of the controls had eaten home-canned bamboo shoots (odds ratio [OR] undetermined; $p<0.001$). Cooking the food containing the bamboo shoots was protective; one (7.7%) of the 13 case-patients cooked bamboo shoots compared with three of four controls who had eaten bamboo shoots (OR=0.03; 95% confidence interval=0.0–0.95). The time between eating bamboo shoots and onset of illness was 6 hours to 6 days (median: 2 days).

syndrome (AIDS) is high. This support assists schools in implementing HIV-prevention policies and programs for adolescents. For example, in Boston and Miami, the local education agency requires high schools to use a curriculum with demonstrated effectiveness in reducing sexual risk behaviors. In Chicago, high school students participate in peer education to develop social skills to avoid peer pressure. In Dallas, school nursing and counseling services support the HIV-prevention program. In Fort Lauderdale, school-based health centers provide health-care services to students at school, including referrals for HIV counseling and testing. CDC also provides fiscal and technical support to local community planning groups to plan and implement HIV-prevention programs and services for adolescents. The decreases in sexual risk behaviors among high school students in the eight cities analyzed in this report may reflect the impact of these and other efforts, including those of families, local government agencies, and community-based organizations.

Despite the reductions in risk for HIV infection among urban adolescents, many remain at risk. Although school-based HIV-prevention education is widely conducted in U.S. schools, efforts are needed to identify and disseminate effective curricula that can help students avoid risk for HIV infection and to increase the percentage of teachers who receive in-service training in HIV prevention (*9*). Community interventions should reinforce school-based HIV prevention and provide additional HIV-related services to all adolescents, particularly those at greatest risk for HIV infection.

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Illnesses Associated with Occupational Use of Flea-Control Products — California, Texas, and Washington, 1989–1997

Dips, shampoos, and other insecticide-containing flea-control products can produce systemic illnesses or localized symptoms in the persons applying them. Although these products may pose a risk to consumers, they are particularly hazardous to pet groomers and handlers who use them regularly. Illnesses associated with flea-control products were reported to the California Department of Pesticide Regulation,

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the Texas Department of Health, and the Washington State Department of Health, each of which maintains a surveillance system for identifying, investigating, and preventing pesticide-related illnesses and injuries.* This report describes cases of occupational illnesses associated with flea-control products, summarizes surveillance data, and provides recommendations for handling these products safely.

Case Reports

Case 1. In April 1997, a 35-year-old female pet groomer treated a dog for fleas by placing the animal in a tub containing water to which was added a concentrated phosmet solution. During application, the dog shook and sprayed the product on the exposed hands and arms of the groomer; a nearby open soft drink can, from which the groomer reported drinking, may have been contaminated. Within an hour after exposure, she developed skin flushing and irritation, shortness of breath, chest pain, accelerated heart rate and respiration, abdominal cramping, and nausea. She sought care at a hospital emergency department, where she was released without treatment after her clothes were discarded, and she showered with soap and ethanol. Plasma and red blood cell (RBC) cholinesterase levels were 4584 U/L (normal: 2900–7100 U/L) and 32 U/g hemoglobin (normal: 24–40 U/g hemoglobin), respectively; however, no baseline or subsequent postexposure cholinesterase levels were available for comparison. The case-patient had been a pet groomer for 1 year and did not use personal protective equipment (PPE) (e.g., gloves, gowns, or goggles). She reported that she regularly applied insecticides with her bare hands and that her clothing was often wet with water and flea-control dips or shampoos. Previous exposures had not made her ill. No analysis of the concentration of the phosmet product was performed.

Case 2. A female pet store employee (age unknown) became ill and sought attention at a medical clinic in September 1993 after she inadvertently sprayed her face and eyes with a pyrethrin/piperonyl butoxide solution while spraying a flea-infested cat house. Despite immediately flushing her eyes with water, she developed eye irritation with reddened conjunctiva and a burning sensation. Mild, diffuse wheezing was noted on examination, although its relation to her exposure is unknown; information about preexisting asthma or respiratory infection was unavailable. An allergic reaction and chemical conjunctivitis were diagnosed, and she received epinephrine, oral antihistamines, and oral steroids. At the time of exposure, she had not been wearing goggles or other PPE. She had not received training for safe handling of pesticides.

Case 3. A 21-year-old female veterinary assistant became ill in April 1992 after applying a phosmet-containing dip to a dog. She reported using a chemical-resistant apron, but no other PPE. A pruritic rash developed on her hands and arms approximately 2 hours after exposure. Later that evening, she developed systemic symptoms, including malaise, chest pains, nausea, vomiting, dizziness, diarrhea, stomach cramps, tremors, blurred vision, and excess salivation. Approximately 48 hours after exposure, she sought care at an urgent-care facility. Cholinesterase levels were not reported; she was treated with antihistamines. The case-patient had been a veterinary assistant for 8 months and had treated animals daily using several flea-control products. Whether she previously had used phosmet-containing products is unknown.

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*These and other agencies, including the U.S. Environmental Protection Agency, collaborate with CDC's National Institute for Occupational Safety and Health in the Sentinel Event Notification System for Occupational Risk (SENSOR), a program that supports the surveillance of acute occupational pesticide-related illnesses and injuries.

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Surveillance Data

During 1989–1997, 16 cases of pesticide-related illness attributable to occupational use of flea-control products were reported in California (13), Washington (two), and Texas (one). The median age of the case-patients was 26 years (range: 16–73 years). Of the 16, eight (all in women) involved systemic illnesses caused by exposure to phosmet (five cases); pyrethrin/piperonyl butoxide (two cases); or a product containing carbaryl, malathion, and pyrethrin/piperonyl butoxide (one case). The other eight (four in women) involved localized symptoms (i.e., chemical conjunctivitis) caused by flea-control products splashing into the case-patients' eyes. In seven of these cases the products contained pyrethrin/piperonyl butoxide, and in one case a phosmet-containing product was used.

After receiving these data in 1998, U.S. Environmental Protection Agency (EPA) staff searched for similar cases in the Toxic Exposure Surveillance System (TESS). In 1993, TESS, maintained by the American Association of Poison Control Centers, began collection of poisoning reports that included symptom information submitted by approximately 85% of the poison control centers in the United States (1996 is the latest year data are available) (*1*). Poisonings involving intentional suicides, intentional malicious use, nonworkplace exposures, and unknown intention were excluded from the search.

Symptomatic occupational exposures involving flea-control dips were identified in 20 women and six men. Responsible active ingredients were phosmet (12 cases); pyrethrin/piperonyl butoxide (five cases); rotenone/pyrethrin (five cases); rotenone, malathion, chlorpyrifos, and unknown (one case each). Eight workers developed moderate health effects that required some form of treatment, and 18 developed minor health effects (minimally bothersome symptoms that resolved rapidly). Among the workers with moderate symptoms, the responsible ingredients were phosmet (five cases), rotenone/pyrethrin (two cases), and pyrethrin/piperonyl butoxide (one case).

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Editorial Note: Pyrethrins are plant-derived insecticides and are common ingredients in flea-control dips and shampoos (*2*). Although pyrethrins have low toxicity in humans (EPA classified as acute toxicity category III compounds[†]), exposures have caused dermatitis and upper respiratory tract irritation (*3*). Allergic contact dermatitis and asthma, sometimes resulting in death, also have been reported (*1,3*). Piperonyl butoxide, an EPA acute toxicity category IV compound, frequently is added to pyrethrins to slow chemical metabolism. No published reports of eye injury involving pyrethrins or piperonyl butoxide were identified.

Phosmet is an organophosphate insecticide and an EPA acute toxicity category II compound. The primary target in humans is the nervous system. Organophosphate exposure is associated with many of the symptoms reported by the first and third case-patients. In animals, phosmet is mildly irritating to the eyes but not irritating to

[†]EPA classifies all pesticides 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.

the skin (*4*); no published reports of skin or eye irritation in humans after exposure have been identified.

The findings in this report are subject to at least three limitations. First, although 76% of the cases described were in women, evidence suggests that this distribution may reflect workforce demographics (more women than men are employed as pet groomers and handlers [*5,6*]) rather than greater sensitivity to these toxins. Second, these surveillance data may not represent all workers with these illnesses. Third, this report describes only workplace-related illnesses following product exposure. Consumers using these products may experience similar illnesses; however, they were not included in this report.

Despite reports of the toxicity of flea-control products (*7–9*), including a high prevalence of symptoms among pet groomers and handlers (*5,9*), illnesses continue to occur among workers using these products. A survey of establishments using flea-control products found that groomers and handlers often were not provided with adequate safety training and PPE (*9*). When using pesticide products, label directions should be followed precisely. For phosmet-containing flea-control products, the label cautions users to wear safety glasses, long-sleeved shirts, long pants, elbow-length waterproof gloves, waterproof aprons, and unlined waterproof boots. For eye safety, CDC's National Institute for Occupational Safety and Health recommends goggles designed to provide splash protection.

Although the EPA does not require PPE for toxicity category III and IV compounds, the findings in this report suggest that PPE may be needed during pyrethrin/piperonyl butoxide use. Workers should be trained in the safe handling of flea-control products and in personal hygiene practices (e.g., washing before eating and prohibition of eating, drinking, food storage, and smoking where flea-control products are used), and should be instructed about insecticide dangers and taught to recognize the symptoms of overexposure. In California, agricultural workers who apply organophosphates on 7 days in any 30-day period are required to have plasma and RBC cholinesterase tests before commencing exposure and periodically thereafter (*8*). Similar testing of workers handling organophosphate-containing flea-control products may be prudent; substitution of safer, less toxic pesticides also should be considered.

This report provides an example of how state-based pesticide poisoning surveillance systems and TESS complement one another; however, both systems are affected by lack of adequate clinical recognition of pesticide-related illness and injury. A new EPA publication may assist health-care professionals to gain expertise in recognizing and managing these conditions (*10*). Free copies are available from EPA; telephone (800) 490-9198.

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Notice to Readers

Changes in National Notifiable Diseases Data Presentation

This issue of *MMWR* incorporates modifications to Tables I and II, Cases of Notifiable Diseases, United States. This year, the modifications will add diseases recently designated nationally notifiable by the Council of State and Territorial Epidemiologists, in conjunction with CDC, and highlight diseases commonly transmitted through food and water. As of January 1, 1999, 56 infectious diseases were designated as notifiable at the national level (Table 1). Except where otherwise indicated, the data presented in the notifiable disease tables are transmitted to CDC through the National Electronic Telecommunications System for Surveillance (NETSS).

Table I

For the infectious diseases added to the list of nationally notifiable diseases that were reportable in <40 states in 1998, data will now be included in Table I; these diseases are cyclosporiasis, human granulocytic ehrlichiosis, and human monocytic ehrlichiosis. Because not all nationally notifiable diseases are reportable in every state or territory, the reported numbers of cases of some diseases in Table I represent only the totals from states or territories in which the diseases are reportable.

Table II

Additions to Table II highlight the continuing or increasing role of foodborne pathogens in human illness. Cumulative totals of the number of salmonellosis, shigellosis, and cryptosporidiosis cases are presented by state and territory. To assist in characterizing the continuing burden of salmonellosis and shigellosis, data about such infections are presented from the Public Health Laboratory Information System (PHLIS) as well as NETSS. Laboratory-confirmed *Salmonella* and *Shigella* cases reported to PHLIS are based on state of report (rather than state of residence) and the date the specimen was collected (rather than *MMWR* week); however, reporting of such cases will be delayed until confirmatory laboratory testing is completed. In addition to current year cumulative totals provided for *Salmonella*, *Shigella*, and *Escherichia coli*