

BOTULISM SUMMARY, 1996
(excluding infant botulism)

In 1996, four confirmed cases of botulism were reported from Los Angeles County: two cases of wound botulism and two of foodborne disease (Table 1). (Infant botulism is reported directly to the State Department of Health Services; specific details are not available.)

WOUND BOTULISM

Both wound botulism cases were heroin injectors, one a 51-year-old Hispanic male and the other a 36-year-old Hispanic female. Both individuals were intoxicated with type A botulinal toxin. The male case-patient was treated with botulinal antitoxin and recovered. Although the female case-patient's diagnosis had been suspected by her primary physician, a serum specimen was sent and lost in transit to the State's Microbial Diseases Laboratory. Three weeks later, the serum specimen was received by the State, which then notified ACDC. During that interval, the patient had been transferred to a rehabilitation hospital because of inability to wean off of mechanical ventilation. Her new physician ordered nerve conduction studies that were consistent with botulism one month after initial presentation. She did not receive botulinal antitoxin since she had begun to demonstrate return of muscular function indicating toxin was no longer being produced.

Five additional injection drug users were diagnosed with "clinical" wound botulism, but serum tests were negative. The State's case definition requires laboratory confirmation or epidemiologic association to a confirmed case. Three cases were male; all five had Hispanic surnames. The average age of the five suspect cases was 42 years (range 33-49), and all were intravenous or subcutaneous heroin injectors. Four were treated with botulinal antitoxin, and all recovered.

FOODBORNE BOTULISM

A 24-year-old pregnant woman was hospitalized on April 1 with signs and symptoms compatible with botulism or myasthenia gravis (MG). The consultant neurologist ordered botulinal toxin screening of serum and stool, but did not consult ACDC and the specimens were never sent out by the hospital laboratory. Later, because the patient had a slight response to edrophonium (Tensilon test), she was felt to have MG. She remained hospitalized for three weeks, during which time her strength returned very slowly. Two weeks after discharge, her baby was delivered at term. A neonatologist was present at delivery to manage the infant for possible congenital myasthenia, although the infant exhibited no such symptoms. Less than a week later, the patient's 34-year-old female cousin (with whom she and her husband were living), was admitted to another hospital with weakness and bulbar palsies compatible with botulism. All were recent immigrants from an Arabic country. Questioning of the husband by several medical providers failed to elicit a suspect food source, although communication was not ideal due to a language barrier. A home inspection by an environmental health investigator uncovered home-preserved onions, eggplant, and olives. Several gallons of food were confiscated pending testing for botulinal toxin.

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The husband initially denied symptoms, but was hospitalized in respiratory failure less than 12 hours after the female cousin's admission; an additional jar of home-preserved vegetables was found in his bedroom. Both the cousin and husband were treated with botulinal antitoxin; the husband recovered in about two weeks, but the cousin had a complicated course and was transferred to a skilled nursing facility for prolonged rehabilitation.

Serum from the cousin contained botulinal toxin type A; the husband was not confirmed by serum testing but was considered a case based on epidemiologic evidence. Four open jars of vegetables were negative for toxin, but the eggplant contained *Clostridium* spores that produced type A toxin. Stool from the 24-year-old initial suspect case (collected approximately 8 weeks after her initial symptoms) was tested for *Clostridium* but none was found; although not officially reported as a such, she was considered an epidemiologically linked case. These cases occurred as a result of failure of a medical provider and laboratory to report the initial suspect case. Health education and destruction of the home-canned food items would have prevented severe morbidity in these individuals.

**Table 1. Summary of Reported Botulism Cases
Los Angeles County, 1996**

Onset Date	Sex/Age	Type	Tests Run	Antitoxin Administered?	Final Diagnosis
03/01/96	♂ / 51	Wound	Serum positive.	Yes	Botulism confirmed.
05/16/96	♀ / 34	Food	Serum positive. Food positive.	Yes	Botulism confirmed.
05/17/96	♂ / 37	Food	Serum not done. Food positive.	Yes	Botulism confirmed.
10/02/96	♀ / 36	Wound	Serum positive on 10/10 (run 11/1 @ State).	No	Botulism confirmed.

HEPATITIS A OUTBREAK ASSOCIATED WITH A CATERING SERVICE NOVEMBER-DECEMBER 1996

BACKGROUND

In December 1996, public health nurses at a local health center became aware of a cluster of hepatitis A cases in the South Bay area of the County. Initial illness reports involved personnel from several local school districts. It soon became evident that exposure was more widespread. The majority of cases reported eating food from a local caterer. The Acute Communicable Disease Control Unit (ACDC) was notified and a joint investigation with the local health center was initiated.

METHODS

Case Ascertainment. All food handlers from the local caterer were tested for recent hepatitis A infection. Enhanced passive surveillance for additional cases was conducted from December 5, 1996, to January 19, 1997, by obtaining case reports from the local health center and central Morbidity Unit. Active surveillance by telephone for cases of hepatitis A was conducted at local hospitals and large medical groups.

Case-Control Study. A case was defined as an individual with reported hepatitis A infection, with onset of symptoms between November 15 and December 15, 1996, 20 to 65 years of age, and living in the South Bay area. Controls were matched to cases by telephone prefix and were restricted to adults 20 to 65 years of age who denied any history of hepatitis-like illness, hepatitis A vaccination, or exposure to a hepatitis A case in the previous three months. One control was obtained for each case. Cases and controls were interviewed by telephone using a standardized questionnaire to elicit food history, dining history, symptomatology, hepatitis A risk factor, and demographic information.

Catered Group Survey. Caterer receipts, invoices, and a list of groups who had ordered food during the exposure period (October 28 to November 1, 1996) were obtained. A one-page survey form was developed for telephone interviews. The form contained questions regarding take-out or delivered food from the caterer as well as from other food establishments, specific food items ordered, and any history of illness compatible with hepatitis A within the incubation period. If information from an individual about specific dates and food items differed from the caterer's records, the caterer's information was used.

Produce Trace-Back. Site visits to the caterer and two produce suppliers were made by investigators from ACDC and the Food and Milk Program to gain a better understanding of food preparation practices and of the produce distribution process.

RESULTS

Case Ascertainment. All food handlers tested negative for recent hepatitis A infection. An office worker tested positive for anti-HAV IgM; her self-reported onset of illness was approximately the same time as the other cases. Active and enhanced passive surveillance led to the identification of 91 suspect hepatitis A cases, the majority of whom reported eating food from a local caterer.

Case-Control Study. Of the 91 suspected cases detected through active and passive surveillance, only 39 were included in the study; the rest were either excluded because they did not meet the case definition (n=36), were unable to be contacted (n=15), or refused to participate (n=1). Cases and controls had similar age characteristics (means of 43 and 45 years, respectively). Cases were more likely to be female than were controls (71% versus 57%), but the difference was not statistically significant.

Of the 137 restaurants which were patronized by the cases during the exposure period, only the implicated caterer was significantly associated with illness (OR=209, CI=23, 8708, p=0.000). Chinese chicken salad from the caterer was strongly associated with illness (OR=39, CI=8, 2722, p=0.001); however, the salad accounted for only 67% of the cases. When food items containing green onions (Chinese chicken salad, Mexican salad, Cobb salad, deli sandwiches, and petit sandwiches) were analyzed together as a group, those items accounted for 82% of cases and were very highly associated with illness (OR=54, CI=18, 6222, p=0.001). No other food establishments or food items were found to be significantly associated with illness.

Catered Group Survey. Eighty-three catered groups were identified, and 61 (74%) were successfully contacted and interviewed. Group sizes ranged from 4 to 100 (mean=26). Twenty (33%) of the groups reported hepatitis-like illness after eating food from the caterer; there was no association between group size and illness.

Of the menu items ordered during the exposure period, only the Chinese chicken salad (OR=5.79, 95% CI=1.51, 23.44) and petit sandwiches (OR=4.09, 95% CI=1.14, 15.11) were significantly associated with illness. Combining all items which contain green onions (Chinese chicken salad, Mexican salad, Cobb salad, deli sandwiches, and petit sandwiches) resulted in an even stronger association (OR=21.62, 95% CI=1.22, 383.81).

Produce Trace-Back. The caterer received produce from two suppliers: one a local South Bay distributor (supplier 1) with approximately 40 customers, and the other a larger distributor (supplier 2) based in the downtown Los Angeles area with approximately 400 to 500 customers in Southern California. These distributors in turn buy their produce from produce brokers who buy directly from growers. The green onions undergo “zero processing” during transit. Zero processing means that, once produce is packed in boxes at the grower, it stays packed in those boxes until delivered to the customer; deliveries to the caterer were apparently always in whole cases (i.e., zero-processed). As the green onions are packed at the grower, they may be “top-iced” (the grower adds ice on top of the vegetables inside the box). During the month of October when the initial exposure most likely occurred, the majority of green onions came from Mexico.

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During the probable exposure period, supplier 1 delivered green onions to the caterer on October 25, 30, and 31; supplier 2 delivered green onions on October 29. At the catering facility, the green onions were rinsed in running water prior to chopping. They were then added to a plastic bucket which may have contained an amount of the previous supply of chopped green onions. Although the caterer mainly operates a take-out and delivery business, there are a small number of sit-down tables on the premises, and a restroom is available for customer and employee use. It was noted that a bucket in the cleaning supply room was similar in appearance to the buckets used to store chopped green onions and other food items.

CONCLUSION/DISCUSSION

In December 1996, an outbreak of hepatitis A associated with consumption of food containing green onions from a particular caterer occurred in the South Bay area of the County. Although green onions were identified as the most likely vehicle of transmission, the exact mode of contamination was not clearly identified. A previous multi-state outbreak investigation in the Midwest implicated contaminated green onions as a vehicle of shigellosis in 1994. In that outbreak, it was hypothesized that contamination of the green onions may have occurred at harvest, during packing, or perhaps even somewhere along the distribution route.

Although the exact point and mechanism of contamination was not determined in this outbreak, we hypothesize a scenario similar to the one described above by investigators in the 1994 multi-state shigellosis outbreak. One possibility may be substandard field and packing sanitation, such as lack of adequate restroom facilities in the fields or use of contaminated ice in the packing of green onions. A factor that may have prolonged the outbreak was the caterer's practice of adding a new supply of chopped green onions to the existing supply in the same green onion bucket. This may have resulted in cross-contamination of the batches and exposure over several days.

Another possibility may be that if an infected customer used the restroom, an employee cleaning the toilet bowl may have mistakenly used and contaminated one of the buckets subsequently used to store chopped green onions. The likelihood of this last scenario is low considering the limited infectious period, limited customer use of the restroom, and the remote possibility of actually using a contaminated bucket for green onions.

This outbreak demonstrates that, with rinsing of contaminated produce, the chance of transmission may be reduced but not eliminated. This is especially true as more produce originates in countries where field maintenance and procedures are not as closely monitored as they are in the United States. Also, improvements in general hygiene and food handling practice should be encouraged to prevent spread of enteric infections in commercial establishments.