Enterotoxigenic *Escherichia coli*: the First Reported Foodborne Outbreak in California

Background

In April 1997, an outbreak occurred at a Mexican restaurant in Los Angeles County. Illness was reported by attendees of three unrelated parties over a two-day period.

Methods

The investigation involved the cooperative efforts of several DHS units. The Food and Milk Program (FM) investigated the food sources and its preparation. Acute Communicable Disease Control administered questionnaires and conducted a case-control study in order to obtain food-specific attack rates and determine a potential food vehicle. District public health nurses collected specimens and counseled cases regarding prevention of further transmission. The LAC Public Health Laboratory (PHL) and State PHL analyzed stool samples and isolates for the etiologic agent.

Results

Ninety-four persons attended the three parties. Of the 53 persons from whom questionnaires were obtained, 41 (79%) reported illness. The incubation period was 5-85 hours; illness duration ranged from 8-96 hours. The major symptoms included profuse watery diarrhea, abdominal cramping, vomiting, and dehydration. The case-control study analysis did not implicate a specific food item as the vehicle of the etiologic agent. Several common foods were served on all the meals.

No food was available for analysis. No food handlers admitted to recent diarrheal illness and stool specimens were not requested. FM's inspection found improper holding temperatures and a non-hygienic environment in the kitchen.

Eleven of 14 stool samples cultured by the PHL grew predominantly ***E. coli*** with the same biochemical profile. These isolates, derived from all three parties, were sent to the State PHL for DNA probing and further biochemical testing. All tested positive for the heat-labile toxin (LT) of ***E. coli*** O27:H7.

Comments

The source of this outbreak could not be identified, but most likely was an infected food handler who contaminated one or more commonly eaten food items.

Primarily an infection of developing countries, ETEC is one of several different strains of diarrhea-producing *E. coli*. It is an important cause of diarrheal dehydration in children under 3 years of age in developing countries, and the most common cause of traveler's diarrhea. Infected humans comprise the reservoir for ETEC. It is transmitted most commonly by contaminated foods and less often by contaminated water; direct transmission via the fecal-oral route is rarely identified.

Enterotoxigenic strains of *E. coli* are similar to *Vibrio cholerae* O1 in causing profuse watery diarrhea without the presence of blood or mucous. Abdominal cramping, vomiting, acidosis, prostration, and

dehydration may occur; low-grade fever may also be present. The incubation period may be as short as 10-12 hours, but 24-72 hours is more common. Symptoms usually resolve within 5 days, although shedding of organisms may be prolonged. In severe cases, oral rehydration therapy should be instituted promptly to prevent significant dehydration. It is also recommended that prompt antimicrobial therapy be initiated, but antibiotic resistance is being seen with greater frequency. Serotype-specific immunity is acquired following ETEC infection.

ETEC is not detected by routine stool cultures. It may be identified by demonstrating enterotoxin production in colony blots using either immunoassay or bioassay, or by DNA probe techniques that identify LT and ST (heat-stable) toxin genes.