Foodborne Botulism From Eating Home-Pickled Eggs --- Illinois, 1997

During November 1997, the Illinois Department of Public Health was notified by a local physician about a possible case of foodborne botulism. This report summarizes the case investigation, which implicated home-pickled eggs as the cause.

On November 23, 1997, a previously healthy 68-year-old man became nauseated, vomited, and complained of abdominal pain. During the next 2 days, he developed diplopia, dysarthria, and respiratory impairment, necessitating hospitalization and mechanical ventilation. Physical examination confirmed multiple cranial nerve abnormalities, including extraocular motor palsy and diffuse flaccid paralysis. Possible botulism was diagnosed, and a one-vial dose of trivalent (types A, B, and E) antibotulinum toxin was administered. A sample of the patient's serum collected before antitoxin administration demonstrated the presence of type B botulinum toxin. A food history revealed no exposures to home-canned products; however, the patient had eaten pickled eggs that he had prepared 7 days before onset of illness; gastrointestinal symptoms began 12 hours after ingestion. The patient recovered after prolonged supportive care.

The pickled eggs were prepared using a recipe that consisted of hard-boiled eggs, commercially prepared beets and hot peppers, and vinegar. The intact hard-boiled eggs were peeled and punctured with toothpicks then combined with the other ingredients in a glass jar that closed with a metal screw-on lid. The mixture was stored at room temperature and occasionally was exposed to sunlight.

Cultures revealed *Clostridium botulinum* type B, and type B toxin was detected in samples of the pickled egg mixture at CDC's National Botulism Surveillance and Reference Laboratory. *C. botulinum* was cultured from the pickling liquid, beets, and egg yolk. The concentration of preformed type B toxin was 1000 times greater in the egg yolks than in the pickling liquid and was undetected in the beets. Peppers from the original commercial container contained no detectable toxin, and bacterial cultures of the peppers did not yield *C. botulinum*. Beets from the original commercial containers were not available. The pH of the pickling liquid was 3.5 (i.e., adequate to prevent *C. botulinum* germination and toxin formation. However, the pH of the egg yolk was not determined [normal egg yolk pH: 6.8]).

*Reported by: G Rifkin, MD, Rockford Memorial Hospital, Rockford; K Sibounheuang, L Peterson, Winnebago County Health Dept, Rockford; K Kelly, C Langkop, D Kauerauf, E Groeschel, B Adam, C Austin, DVM, S Bornstein, MD, Illinois Dept of Public Health.*
Botulism is a paralytic illness caused by the neurotoxin produced by the bacterium \textit{C. botulinum}. Paralysis first affects the cranial nerves, then the skeletal muscles; untreated intoxications can lead to dense flaccid paralysis, respiratory failure, and death (1,2).

Although rare and sporadic, foodborne botulism is a persistent cause of morbidity and mortality in the United States. In 1997, an annual survey of state epidemiologists and directors of state public health laboratories identified 24 cases of foodborne botulism with one associated death (CDC, unpublished data, 1998). During 1989--1998, a median of 23 cases (range: 17--42 cases) of foodborne botulism was reported each year with a median of one death (range: 0--2 deaths).

\textit{C. botulinum} spores are ubiquitous. Safe food preservation methods destroy spores or inhibit their germination and growth. Conditions that promote germination and growth of \textit{C. botulinum} spores include absence of oxygen (anaerobic conditions), low acidity (pH >4.6), temperatures >39 F [4 C]), and high moisture content. Most foodborne botulism cases that occur in the United States are the result of improperly home-canned foods. This is the first reported case of botulism related to eating pickled eggs. The amount of toxin detected in the recovered egg yolk suggested that bacterial growth was concentrated in that portion of the egg. Intact eggs that have been hard-boiled should be free of bacteria or spores. Pricking cooked eggs may introduce \textit{C. botulinum} spores into the yolk. Portions of the yolk that remained anaerobic and inadequately pickled (i.e., not acidified to pH <4.6) may have allowed \textit{C. botulinum} spores to germinate, grow, and form toxin. Setting the pickling jar in sunlight provided warmth that facilitated bacterial growth and toxin production.

To reduce the risk for botulism when pickling, food items should be washed and cooked adequately, and utensils, containers, and other surfaces in contact with food, including cutting boards and hands, should be cleaned thoroughly with soap and warm water. Containers (e.g., jars and lids) in which pickling will occur should be sterilized (e.g., placed in boiling water for the prescribed period published in the container instructions) (3). Adequate acidification to a pH <4.6 is essential. Refrigeration at 39 F (4 C) during pickling is advisable, especially in foods that may be acidified inadequately such as whole eggs. Once opened, any canned or pickled food should be refrigerated. Pricking, poking holes, or otherwise handling whole eggs in a manner that might allow spores or bacteria into the yolk should be avoided.

When foodborne botulism is suspected, clinicians and public health investigators should inquire about the preparation and eating of foods preserved by any home method (e.g., canning, pickling, curing, and fermenting). Persons seeking advice on home-food preservation should consult their local county or university cooperative extension service, or contact the U.S. Department of Agriculture Food Safety Hotline, telephone (800) 535-4555. CDC provides epidemiologic consultation and laboratory diagnostic services for suspected botulism cases and authorizes release of botulism antitoxin. Through state health departments, these services are available 24 hours a day from CDC.
References


Disclaimer  All MMWR HTML versions of articles are electronic conversions from ASCII text into HTML. This conversion may have resulted in character translation or format errors in the HTML version. Users should not rely on this HTML document, but are referred to the electronic PDF version and/or the original MMWR paper copy for the official text, figures, and tables. An original paper copy of this issue can be obtained from the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, DC 20402-9371; telephone: (202) 512-1800. Contact GPO for current prices.

**Questions or messages regarding errors in formatting should be addressed to mmwrq@cdc.gov.

Page converted: 8/31/2000