

ID news briefs

Outbreak of type E foodborne botulism linked to traditionally prepared salted fish in Ontario, Canada.

On April 17, 2012, two adult females presented to a hospital with symptoms of botulism. Patient A displayed shortness of breath, increasing lethargy, ptosis, and fixed and dilated pupils, and was intubated after admission. Patient B presented with shortness of breath, vomiting, and stridor. Both patients consumed a meal consisting of a traditionally prepared salted fish, fesikh, two days before to celebrate Sham el-Nessim, an Egyptian holiday marking the beginning of spring. Foodborne botulism was suspected and antitoxin was administered to both patients. Another attendee of the same gathering (Patient C), who had also consumed the implicated food, developed symptoms. Clinical specimens from all three symptomatic attendees tested positive for either *Clostridium botulinum* or type E *botulinum* neurotoxin. Fesikh remaining from the shared meal contained both type E *botulinum* neurotoxin and *C. botulinum* type E organisms. Unsold fesikh shad and fesikh sardines tested positive for *C. botulinum* type E. After consultation, all fesikh products were voluntarily withheld from sale by the manufacturer, preventing further cases. This is the first documented outbreak of foodborne botulism associated with fesikh to occur in Canada.

Walton RN, Clemens A, Chung J, Moore S, Wharton D, Haydu L, de Villa E, et al. *Foodborne Pathog Dis*. 2014 Sep 4. [Epub ahead of print]

Novel microbiological and spatial statistical methods to improve strength of epidemiological evidence in a community-wide waterborne outbreak.

Failures in the drinking water distribution system cause gastrointestinal outbreaks with multiple pathogens. A water distribution pipe breakage caused a community-wide waterborne outbreak in Vuorela, Finland, in July 2012. We investigated this outbreak with advanced epidemiological and microbiological methods. A total of 473 of 2,931 inhabitants (16%) responded to a web-based questionnaire. Water and patient samples were subjected to analysis of multiple microbial targets, molecular typing and microbial community analysis. Spatial analysis on the water distribution network was done and we applied a spatial logistic regression model. The course of the illness was mild. Drinking untreated tap water from the defined outbreak area was significantly associated with illness (RR 5.6, 95% CI 1.9–16.4) increasing in a dose response manner. The closer a person lived to the water distribution breakage point, the higher the risk of becoming ill. Sapovirus, enterovirus, single *Campylobacter jejuni* and EHEC O157:H7 findings as well as virulence genes for EPEC, EAEC and EHEC pathogroups were detected by molecular or culture methods from the faecal samples of the patients. EPEC, EAEC and EHEC virulence genes and faecal indicator bacteria were also detected in water samples. Microbial community sequencing of contaminated tap water revealed abundance of *Arcobacter* species. The polyphasic approach improved the understanding of the source of the infections, and aided in defining the extent and magnitude of this outbreak.

Jalava K, Rintala H, Ollgren J, Maunula L, Gomez-Alvarez V, Revez J, Palander M, et al. *PLoS One*. 2014 Aug 22;9(8):e104713.

Current perspectives on viable but non-culturable (VBNC) pathogenic bacteria.

Under stress conditions, many species of bacteria enter into starvation mode of metabolism or a physiologically viable but non-culturable (VBNC) state. Several human pathogenic bacteria have been reported to enter into the VBNC state under these conditions. The pathogenic VBNC bacteria cannot be grown using conventional culture media, although they continue to retain their viability and express their virulence. Though there have been debates on the VBNC concept in the past, several molecular studies have shown that not only can the VBNC state be induced under in vitro conditions but also that resuscitation from this state is possible under appropriate conditions. The most notable advance in resuscitating VBNC bacteria is the discovery of resuscitation-promoting

factor (Rpf), which is a bacterial cytokines found in both Gram-positive and Gram-negative organisms. VBNC state is a survival strategy adopted by the bacteria, which has important implications in several fields, including environmental monitoring, food technology, and infectious disease management; hence it is important to investigate the association of bacterial pathogens under VBNC state and the waterborne/foodborne outbreaks. In this review, we describe various aspects of VBNC bacteria, which include their proteomic and genetic profiles under the VBNC state, conditions of resuscitation, methods of detection, antibiotic resistance, and observations on Rpf.

Ramamurthy T, Ghosh A, Pazhani GP, Shinoda S. Front Public Health. 2014 Jul 31;2:103.