

Late-Breaking Reports



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DEPARTMENT OF HEALTH AND HUMAN SERVICES



Friday, April 20, 2009

Late-Breaking Reports

- 10:30** Late-Breaking Reports. Moderators: Douglas Hamilton and Eric Mintz
- 10:35** Nuts Over Salmonella: Multistate Outbreak of *Salmonella* Serotype Typhimurium Infections Associated with Peanut Butter and Peanut Butter-Containing Products — United States, 2008–2009. *Elizabeth Cavallaro*
- 10:45** Epidemic of Fatal Acute Renal Failure Associated with Liquid Teething Medication Contaminated with Diethylene Glycol, Among Young Children — Nigeria, 2008–2009. *Michael Nguyen*
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Nuts Over Salmonella: Multistate Outbreak of Salmonella serotype Typhimurium Infections Associated with Peanut Butter and Peanut Butter-Containing Products — United States, 2008–2009

Elizabeth C. Cavallaro, K. Date, C. Kim, C. Medus, S. Meyer, K. Smith, Q. Phan, S. Nowicki, E. Daly, D. Bergmire-Sweat, S. Cosgrove, K. Wannemuehler, C. Schwensohn, R. Tauxe, I. Williams, C. Barton Behravesh, and the *Salmonella* Typhimurium Outbreak Investigation Team

Background: Approximately 40,000 laboratory-confirmed cases of *Salmonella* infection are reported annually, and *Salmonella* serotype Typhimurium causes ~19%. Investigations of outbreaks involving contaminated food ingredients are complex because products may be distributed through multiple channels and consumed in various settings. We investigated a multistate outbreak of *Salmonella* Typhimurium infections identified in November 2008.

Methods: A case was defined as infection in a person with outbreak strain of *Salmonella* Typhimurium with illness onset on or after 9/1/2008. Two case-control studies (CC1 and CC2) were performed. Controls were well persons from the community matched by age and location. Traceback and environmental investigations were conducted.

Results: Among 691 cases identified in 46 states, 24% (164/691) were hospitalized and nine died. In CC1, illness was associated with eating any peanut butter (PB) (matched odds ratio [mOR]=2.53, 95% confidence interval [CI]=1.26-5.31). The outbreak strain was isolated from Brand A institutional PB produced by Manufacturer A. Ongoing interviews of patients not associated with institutional settings indicated that many patients had eaten PB-containing products. In CC2, illness was associated with eating PB crackers (mOR=9.08, CI=4.86-18.05), specifically Brand B (mOR=18.65, CI=7.59-55.07) and Brand C (mOR=4.13, CI=1.65-10.68). Major national brands of jarred PB found in grocery stores were not associated with illness. The outbreak strain was isolated from Brand B PB crackers which containing peanut paste from Manufacturer A, PB-flavored pet treats, and other PB-containing products linked to Manufacturer A. Traceback investigations resulted in the recall of >3,490 PB and PB-containing products.

Conclusions: Contaminated PB and other peanut products from Manufacturer A were used as ingredients in many different foods that were widely distributed, resulting in one of the largest U.S. food recalls.

Key words: *Salmonella*; peanut butter; foodborne outbreak

Epidemic of Fatal Acute Renal Failure Associated with Liquid Teething Medication Contaminated with Diethylene Glycol, Among Young Children — Nigeria, 2008–2009

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Background: Diethylene glycol (DEG) poisoning is a known cause of epidemic toxic nephropathy associated with ≥ 10 prior outbreaks of acute renal failure (ARF) worldwide. In January 2009, Nigeria's Federal Ministry of Health (FMOH) reported 84 deaths among 111 suspected ARF cases involving young children. Many had ingested a contaminated paracetamol-containing teething syrup (Medication A) during Nigeria's second DEG-associated outbreak. Medication A had been recalled in November 2008. FMOH requested assistance to determine the extent of the outbreak and identify other potential sources.

Methods: We interviewed patient caregivers or their physicians to collect demographic, clinical, and medication exposure information. Additional case finding was performed through hospital surveillance. Medications remaining in households were collected for DEG testing. A case was defined as acute-onset anuria or oliguria for ≥ 24 hours of unknown etiology.

Results: We interviewed 67/111 (60%) caregivers or physicians of suspected patients and identified four others during surveillance. Among 71 patients, 57 (80%) met the case definition. Of these, 65% were male; median age was 12 months (range: 0–27 months); and 95% died. One patient's onset date was two months after the recall. Ingestion of Medication A was reported in 96% of cases. Although 76% of those exposed reported ingesting >1 medication, no other medication was as frequently reported. DEG contamination was identified in all 6 bottles of Medication A collected and in one additional medication (coingestion in one case).

Conclusions: This investigation confirmed Medication A as the primary source of Nigeria's second and largest DEG-associated outbreak. Contamination was not limited to Medication A, and exposure may be ongoing despite the product's recall. We recommend continued surveillance and renewed efforts to strengthen and expand recalls.

Key words: diethylene glycol; disease outbreaks; drug contamination; kidney failure; children; Nigeria; poisoning

Human Infections due to a Novel Deer-associated Parapoxvirus in Two Eastern States, 2008

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Background: In January 2009, a dermatologist from Connecticut requested assistance from CDC in diagnosis of a suspected parapoxvirus infection. Parapoxvirus infection, an occupational risk for people exposed to domestic ruminants, manifests as painful nodular lesions. The patient reported no contact with domestic ruminants but hunted deer in November 2008. In early February 2009, a dermatologist from Virginia notified CDC of a similar case in a deer-hunter with a similarly timed exposure and presentation. Samples from both were analyzed at CDC.

Methods: We interviewed the patients, physicians, wildlife experts, and veterinarians to identify the exposure, to confirm that patients were not exposed to domestic ruminants, and to ascertain details about the exposure to deer. Molecular (real-time PCR and sequencing) and histopathologic analyses were performed to identify the agent causing the infection.

Results: Both patients reported having nicked their skin while handling deer carcasses about two weeks from symptom onset. Both reported manipulating the head, where parapox typically infects ruminants. Neither wore gloves. Both deer appeared healthy with no visible lesions. Histopathologic, immunohistochemical and electronmicroscopic examination showed evidence of a parapoxvirus infection. Molecular analysis revealed a closer genetic relationship between the two deer-associated viruses than with all known pseudocowpoxviruses (from the United States and Bangladesh) suggesting the possibility of a novel species pairing.

Conclusions: These are the first molecularly confirmed human parapoxvirus infections linked to deer exposure, and viral sequences suggest the etiologic agent may be a novel parapoxvirus. Physicians, hunters, and wildlife handlers must be made aware of the risk of parapoxvirus infection, associated with wild deer. We are preparing educational material in anticipation for the upcoming hunting season.

Key words: parapoxvirus; deer-hunters; poxviruses; genotyping; molecular epidemiology

Community Assessment for Public Health Emergency Response Following the Winter Ice Storms in Kentucky — February 2009

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Background: Kentucky was declared a major disaster area after a severe ice storm struck January 27, 2009, causing 36 deaths and leaving 770,000 residents without power. On February 2, 2009, the Kentucky Department for Public Health (KYDPH) requested assistance in rapidly assessing the health and safety of persons residing in rural and remote counties in western Kentucky. In response, a CDC team deployed to conduct a Community Assessment for Public Health Emergency Response (CASPER).

Methods: CASPER was conducted in four areas; each area was composed of 1–4 counties. The team used multistage probability sampling and weighted analyses to provide census-based population estimates of needs for each of the four sampled areas. A standardized data collection instrument was administered to households and included questions regarding storm related injuries and illnesses, generator use, availability of basic necessities, barriers to shelter use, and special needs.

Results: Between February 6 and 9, teams completed 735 interviews across the four areas. Almost 2 weeks after the storm, up to 25% of households were still without electricity, up to 56% had used generators, and 5%–7% did not have a working telephone. In some areas, 20% claimed that pet ownership prevented them from seeking alternative shelter. Up to 23% reported illness, up to 10% reported an injury, and up to 16% reported mental health problems. Among those reporting special needs (10% of total) 44%–67% were oxygen dependent.

Conclusions: In response to CASPER results and recommendations, KYDPH distributed radio announcements and flyers about how to safely use generators. Further, KYDPH's planning for future disaster response includes pet-friendly shelters, alternative communication mechanisms, and ways to better address special needs of oxygen dependent individuals.

Key words: crisis response; emergency response; preparedness; rapid needs assessment

First Imported Case of Marburg Hemorrhagic Fever in the United States — Colorado, 2008

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Background: During January 2009, a case of Marburg hemorrhagic fever (MHF) was diagnosed retrospectively at CDC in a Colorado resident who became ill in January 2008 after returning from a trip to Uganda. MHF is caused by Marburg virus, a filovirus related to Ebola virus, is endemic in Africa, and has caused up to 90% case-fatality in large African outbreaks. Fruit bats are the presumed reservoir. This is the first imported case of filoviral hemorrhagic fever in the United States.

Methods: We interviewed the patient and her husband, reviewed her medical records, and investigated her contacts. A contact was a person who had physical contact with the patient, her body fluids, or potentially contaminated materials, during the period in which the patient was acutely ill. We planned to offer serologic testing and further investigate contacts with high-risk (nonintact skin, percutaneous or splash) exposure, or a severe febrile illness within the 21-day incubation period after last contact.

Results: The patient likely acquired MHF through exposure to bats while visiting a cave in Uganda; she experienced symptoms 10 days later, 3 days after returning to the United States. Among 230 people identified as contacts (220 healthcare workers and 10 social contacts), no high-risk exposures were identified nor any illness consistent with secondary transmission of MHF. Investigation of staff at outside reference laboratories is ongoing.

Conclusions: No apparent secondary transmission associated with the first imported MHF case in the United States has been identified to date. Travelers should be aware of the risk for acquiring MHF from bats in endemic areas. Healthcare providers should have a low threshold for suspecting viral hemorrhagic fever among travelers from endemic areas.

Key words: Marburg hemorrhagic fever; Marburg virus; filovirus; zoonotic disease; traveler's health

Serving High-risk Foods in a High-risk Setting: Survey of Hospital Foodservice Practices Following a Hospital Outbreak of Listeriosis — New York City, February 2009

Anne Marie France, V. Reddy, H. Hanson, S. Balter

Background: During August–September 2008, a listeriosis outbreak occurred in a New York City (NYC) hospital. Five patients, all with medical conditions that put them at high risk for listeriosis, had laboratory-confirmed *Listeria monocytogenes* infection; three died. The *Listeria* outbreak strain was isolated from tuna salad prepared in the hospital. Prepared ready-to-eat salads and deli meats present a high risk for *Listeria* contamination; risk increases with duration of refrigerated storage. Because no foodborne illness risk management guidelines exist specifically for U.S. hospitals, we surveyed NYC hospitals to characterize policies and practices.

Methods: In February 2009, NYC's 63 acute-care hospitals were asked to participate in a telephone survey regarding dietary and kitchen practices and policies. Questions focused on high-risk foods and policies restricting service of high-risk foods to pregnant or immunocompromised patients.

Results: Forty-five (71%) of 63 hospitals responded (median bed capacity, 386; range 20–1,200). Overall, 78% reported serving ready-to-eat deli meats to patients, and 100% reported serving prepared ready-to-eat salads. Pregnant women, chemotherapy patients, and patients on immunosuppressive drugs were served ready-to-eat deli meats at 79%, 48%, and 56% of hospitals, respectively, and were served prepared ready-to-eat salads at 97%, 76%, and 85% of hospitals, respectively. Eleven percent of hospitals reported a policy that ready-to-eat deli meats must be heated until steaming before serving. Median refrigerated storage time allowed for ready-to-eat deli meats and cold-prepared salads was 72 and 60 hours, respectively.

Conclusions: Despite potential for severe outcomes of *Listeria* infection among hospitalized patients, the majority of NYC hospitals had no dietary or food preparation policies to minimize risk. Hospitals should implement policies to avoid serving high-risk foods to patients at risk for listeriosis.

Key words: *Listeria monocytogenes*; outbreak; hospital infection

Cluster of Renal Transplant-Acquired Zygomycosis — South Carolina and North Carolina, 2009

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Background: Zygomycetes, environmental molds typically found in soil and decaying vegetation, cause rare, but often lethal infections among immunocompromised persons. In January 2009, CDC was notified of two kidney transplant recipients with renal zygomycosis. Both kidneys came from one donor, a near-drowning victim in a motor vehicle crash (MVC). Transplant-acquired renal zygomycosis has not been previously reported.

Methods: We interviewed MVC emergency responders and reviewed donor and recipient medical records for common exposures. We sampled air, water, bulk soil, surfaces, organ preservation solutions, and medical equipment from the MVC site, automobile, organ procurement hospital, and facility where the kidneys were prepared for transplantation. Environmental samples were cultured for Zygomycetes. Microscopy, DNA sequencing, and random amplified polymorphic DNA (RAPD) typing were used for genus, species, and strain identification. Transplant centers and the medication and equipment manufacturers were queried for other reports of Zygomycete infections.

Results: One recipient died from disseminated zygomycosis. The donor's medical records revealed Gram-negative bacteremia and pneumonia with mud and grass present in the airway but no clear evidence of fungal infection. Histopathology of the recipients' explanted kidneys revealed extensive vascular invasion, demonstrating a hematogenous route of contamination. Sequencing and RAPD methods identified indistinguishable strains of the Zygomycete *Apophysomyces elegans* in both recipients. We detected other Zygomycetes species, but not *A. elegans*, from air sampled at the MVC site and the automobile. No other organ transplant-related Zygomycete infections were reported.

Conclusions: Epidemiologic investigation revealed either isolated contamination during organ procurement or preparation, or undiagnosed donor infection after a near-drowning event. To better understand the frequency and impact of similar occurrences, a national organ and tissue allograft disease transmission sentinel network is needed.

Key words: zygomycosis; kidney transplantation; near-drowning; histopathology

Ongoing Outbreak of Typhoid Fever with High Rate of Intestinal Perforations — Kasese District, Uganda, 2008–2009

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Background: *Salmonella enterica* serotype Typhi causes an estimated 22 million cases of typhoid fever and 216,000 deaths worldwide annually; intestinal perforation occurs in 1%–3% of cases. In August 2008, the Ugandan Ministry of Health (MOH) began investigating an ongoing typhoid fever outbreak with many intestinal perforations in rural Kasese District. In February 2009, CDC joined the investigation to enhance laboratory-based surveillance and determine the magnitude of the outbreak.

Methods: A suspect case was defined as onset of fever, headache, and abdominal pain in a person with either vomiting, diarrhea, constipation, general body weakness, joint pain, poor response to antimalarials, or intestinal perforation. Beginning on March 2, 2009, suspect cases were interviewed and provided blood and stool samples for bacterial culture, and serum for serologic testing.

Results: From July 1, 2008, through March 19, 2009, 309 suspect cases of typhoid fever were reported. Median age was 16 years (range <1–70 years); 104 (34%) were female. Two hundred thirteen (69%) were hospitalized; 169 (55%) had intestinal perforation and at least 17 died (6%). *Salmonella* Typhi was detected in 3 of 12 stool cultures and 0 of 17 blood cultures before enhanced laboratory-based surveillance began and in 3 of 45 stool and 4 of 52 blood cultures since. Serologic tests were positive in 14 (29%) of 49 suspect cases.

Conclusions: This large outbreak of typhoid fever is associated with high rates of intestinal perforation and mortality, possibly due to underreporting of milder illnesses or increased virulence of the strain. A community survey will be conducted to assess underreporting. Examination of *Salmonella* Typhi isolates is planned to characterize virulence factors and determine if illnesses are due to a single strain.

Key words: typhoid fever; *Salmonella*; surveillance; epidemic