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Epidemiology: The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to control health problems.

Stedman's Medical Dictionary, Ed. 27

Incident of Foodborne Illness Associated with Ingestion of an Intentionally Contaminated Soft Drink, Sanford, Florida, August 2006

***by Dean Bodager, RS, DAAS, MPA, Gregory Danyluk, PhD
and Peggy Booth, RN, BSN***

Introduction

On August 10, 2006, the Seminole County Health Department (Seminole CHD) received notification from the Florida Department of Business and Professional Regulation (DBPR) of a complaint of illness in a person who alleged that bleach was placed in her drink while working at a food service facility in Sanford, Florida. Symptoms were initially reported as dizziness, numbness, burning in the throat, shaky and blurred vision. Onset of symptoms was reported to have occurred within five minutes of consuming a beverage obtained from the food service establishment.

Methods

The DBPR conducted an inspection of the food service facility on August 16. The victim was interviewed by Seminole CHD on August 16 to elicit clinical symptoms and other details of the alleged incident, and to obtain copies of police and medical records from her parents. The Sanford Police Department had been contacted by the complainant on August 9 and their investigation was completed on August 10. The patient had been treated at a local hospital on August 9 with a follow up physician visit on August 17. There was no food specimen available for testing.

Results

On August 9, 2006 at approximately 8:00 p.m., a 17 year-old girl experienced a variety of symptoms consistent with chemical poisoning within five minutes of swallowing a gulp of soda from her drink container while working at a food service facility in Sanford, Florida. Upon ingestion, the victim noticed that the drink had a bleach taste and one of her coworkers exclaimed "sanitizer" and laughed. The victim was taken to a local hospital by Sanford Fire and Rescue for evaluation and treatment. Symptoms described by the patient to the attending physician were limited to burning chest pain, transient tingling, and a sore throat; the hospital report noted a normal ear, nose and throat inspection. Symptoms described to the Seminole CHD personnel included burning throat, blurred vision, headache, numbness, and dizziness lasting for approximately two to three hours. During a follow-up visit, the physician was told by the patient that all the symptoms lasted two days.

The victim's father had contacted the Sanford Police Department on August 9 at 9:30 p.m. to facilitate an investigation to determine the type of poison that had been placed in the implicated container. The investigating officer discovered that chlorine sanitizer, packaged in a one-ounce size, was dumped into a 16-ounce filled drink container by one of the employees of the food service facility, and this information was immediately relayed to the hospital. The victim reportedly discarded the drink in a waste receptacle at the restaurant immediately following ingestion, and none was available for testing. According to the Material Data Safety Sheet (MSDS) from the manufacturer, the hazardous ingredient in the product as defined by OSHA is sodium dichloroisocyanurate dihydrate, which constitutes 25% of the package contents (Procter and Gamble, 2006).

The inspection on August 16 of the food service facility by the Florida DBPR revealed that toxic substances were properly stored and labeled. All required food safety education courses for managers and employees were current. There was a presence of noxious vermin in the facility that resulted in an emergency order and closure until corrected. The facility was cleared for re-opening on August 17.

Conclusion

This case of foodborne illness is associated with the consumption of a soda drink contaminated with a chlorine sanitizing compound. The illness onset occurred immediately after the implicated drink was swallowed. The symptoms described by the victim and by medical personnel who treated her are consistent with the ingestion of hypochlorites and related agents, and are similar to other documented chemical poisonings (CDC, 2006). There was no other known source of exposure that would cause the described symptoms.

The police report indicates that the contamination of the implicated drink with the sanitizer was intentional and initiated by a co-worker or co-workers as a prank. The entire contents of a packet (approximately 28.4 grams) poured into a filled 16-ounce container (approximately 470 milliliters) and uniformly distributed would result in a concentration of sodium dichloroisocyanurate dihydrate (at 25% composition) of approximately 15 g/l. Under these conditions, this could result in the ingestion of approximately 300 mg in a 20 ml "gulp." By contrast, the WHO recommendation for disinfecting drinking water is no more than 3.6 mg sodium dichloroisocyanurate dihydrate/liter, where an adult is assumed to drink approximately 2 liters of water per day (Joint Expert Committee on Food Additives, 2006). According to the MSDS, the LD₅₀ (Lethal Dose: amount of toxic agent that is sufficient to kill 50 percent of a population of animals within a certain period of time) in rats for the hazardous ingredient is 735 mg/kg body weight (bw). The probable oral lethal dose for humans for related trichloroisocyanurate is between 0.5 to 5 g/kg bw (Toxnet, 2006). Under the conditions described above, the concentration of chlorine in the drink would be approximately 8000 ppm. By comparison, greater than 5 ml/kg bw of household bleach (a concentration of 50,000 ppm) may cause corrosive damage to the oropharynx, esophagus, or stomach (Toxnet, 2006).

Prevention of disease is the foundation of public health practice. Intentional contamination of food or water with harmful chemicals by a malicious or mischievous person is difficult to prevent and severe illnesses may result. Intentional food/beverage contamination can range from the intent to affect large groups via terrorist acts or disgruntled employees or group members, or can be a deliberate, criminal intent to poison a single person or a prank (as seems to be the case here). Prompt medical treatment and investigation of incidents involving illnesses resulting from an intentional contamination is critical in minimizing the health and psychological effects of such acts.

Resources

CDC Website <http://www.bt.cdc.gov/agent/chlorine/basics/facts.asp>, Accessed August 25, 2006.

Procter and Gamble Website

http://www.pg.com/content/pdf/01_about_pg/msds/professional_line/professional_line/Clean_Quick_Chlorine_Sanitizer.pdf, Accessed August 25, 2006.

TOXNET Hazardous Substances Data Bank

<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>, Accessed September 1, 2006.

Joint Expert Committee on Food Additives—Monographs and Evaluations

<http://www.inchem.org/documents/jecfa/jecmono/v52je21.htm>, Accessed September 1, 2006.

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Overweight and at Risk of Overweight: Body Mass Index Categories of Students in Duval County Public Schools

by Melissa Covey, MPH and Helen Jackson, PhD, RD

Since the 1970s, the number of overweight children 6-11 years of age tripled, and doubled among children 12-19 years of age. Data from the 2003-2004 National Health and Nutrition Examination Survey (NHANES) estimated that 37.2% of children 6-11 and 34.3% of children 12-19 years of age were either overweight or at risk of overweight. Childhood overweight is of special concern because children who are overweight are at greater risk of developing chronic diseases.⁽¹⁾



The survey uses height and weight measurements to calculate body mass index (BMI) from its sample of children and adults from across the nation. The BMI is a screening tool used to identify possible weight problems. The CDC and the American Academy of Pediatrics recommend the use of BMI to screen for overweight in children beginning at two years old. Body mass index is considered a reliable indicator for body fatness for most children and teens, and is used as an inexpensive alternative for body fat measures. The use of BMI as a diagnostic tool is not recommended.⁽²⁾

To investigate the extent to which Duval students are overweight or at risk for overweight, BMI measurements were collected from a convenience sample of 34,537 students at 124 schools during the 2005-2006 academic year. A large majority (30,420) of these students attended elementary schools, 3,965 students attended middle schools, 120 attended 11th grade, and 26 attended special schools. Of the elementary school students assessed, 17.1% were found to be overweight and 15.8% were at risk for overweight. Overall, 32.9% of these students were either overweight or at risk for overweight. This is similar to the 18.8% overweight and slightly lower than the 18.4% at risk for overweight found in children ages 6-11 by NHANES. In addition, a gradual increase by grade occurred in the percentages of Duval elementary students who were either overweight or at risk of overweight, beginning with 27.7% in Kindergarten and increasing in each grade to 39.2% in 5th grade.

Interpretation of the data is limited due to the use of non-random sampling and low participation rates. Low participation especially prevents interpretation of the data at the middle and high school levels.

1. Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM. Prevalence of overweight and obesity among US children, Adolescents, and Adults, 1999-2002. JAMA. 2004 June 16;291(23):2847-47.

2. Centers for Disease Control and Prevention. BMI - Body Mass Index: About BMI for Children and Teens. 2006 May 10. Web site accessed June 09, 2006: http://www.cdc.gov/nccdphp/dnpa/bmi/childrens_BMI/about_childrens_BMI.htm

Melissa Covey is a volunteer assistant in the Division of Community Nutrition Services at the Duval County Health Department. Helen Jackson is director of the Division of Community Nutrition Services.

Training News

by Debora Campbell, MS, CHES

Mapping Florida Communities: An Introduction to GIS and Community Demographic Analysis Workshop will be held in Tallahassee on October 24, in Orlando on October 27, in Miami October 12 and 13th, and in Jacksonville on October 19 and 20. This one-day workshop is designed to provide the fundamentals in GIS. The cost is \$399 and includes software and a subscription to useful materials. For more information, call 877.241.6576 or visit <http://www.newurbanresearch.org>

Bureau of Epidemiology annual statewide seminar is scheduled for October 31 thru November 1 at the Tampa Airport Marriott. The deadline has passed for hotel reservations at this particular hotel, but accommodations can be found at other area hotels. For further information, contact Debora Campbell, at 850.245.4444, ext. 4409.

The Second Annual National Conference on Environmental Sampling and Data Bi-threat Agents will be held at the New York Marriott Brooklyn Bridge from October 25 through October 27, 2006. Conference topics will include international perspectives on environmental sampling, dealing with the media during a WMD incident, agricultural and food sample collection, generic and trigger detection devices, and unique aspects of indoor biological detection. Registration ends October 16 and cost of registration is \$700. For more information, call 410.297.2300 or go to info@sampling-conference.com

AG Holley State Hospital in Lantana is presenting a **Grand Rounds on Fluoroquinolones and Tuberculosis** from 10:00 until noon on October 25, 2006. The featured speaker will be Timothy Sterling, MD, an associate professor of medicine at Vanderbilt University. There is no charge for this event. To register, go to <http://sntc.medicine.ufl.edu/>

Bureau of Epidemiology Grand Rounds on a Nontuberculous Mycobacteria Pseudo outbreak will be conducted October 24. CEUs will be offered, and the scheduled presenter is Karen Alelis, MPH, an EIS fellow assigned to the Pinellas County Health Department.

Epi In Action, a training course for professionals in epidemiology, will be held November 28 - December 8 from 8:30 - a.m. until 5:00 p.m. in Clearwater. This weeklong course is in conjunction with Emory University and will include case finding, surveillance, interviewing, outbreak investigation, communicable disease control and other facets of applied epidemiology. There is no charge for the course; however, enrollment must be received by October 25. For further information about venue and other specifics, contact Debora Campbell at extension 4409.

Debora Campbell is coordinator of the training section at the Bureau of Epidemiology in Tallahassee. To contact her, call 850.245.4444, ext. 4409.

Five Clusters of Neurotoxic Shellfish Poisoning (NSP) in Lee County, July, 2006

by Robin Terzagian

Background

Cluster 1: On July 5, 2006, Robyn Kay, from the Bureau of Epidemiology, received an after-hours call from a physician in Ft. Myers. He reported that a Vietnamese family, four sisters on vacation (Florida residents - three from St. Johns County, the fourth from Dade County) had become ill within five hours after eating clams sautéed in wine and butter, and that they had self-harvested from Sanibel Island in an area not open to legal shellfish harvesting. The four women developed neurological symptoms and presented to the emergency room. Two were stable and released after examination and the other two were admitted to the hospital. Symptoms reported included slurred speech, muscle weakness (ataxia), and tingling/numbness of the arms. Their ages ranged from 32-56 years. The two who were admitted have been released and presently all are in good condition.

The clams were collected just offshore along the gulf side of Sanibel Island on Middle Gulf Drive. The closest land GPS was Lat +26.436053 Long -82.047556 North 26 degrees 26.16318, West 082 Degrees 2.85336.

Two small clams left over from the meal were sent to the Florida Fish and Wildlife Research Institute in St. Petersburg (FWRI) for laboratory analysis. The clams were identified as *Mactrotoma fragilis* (Gmelin, 1791), a small surf clam that is common along the SW Florida coast (see http://www.shellmuseum.org/sanibel/shells_fragilis.html). The Lee CHD received verbal confirmation from FWRI that the clams were positive for brevetoxin.

On July 11, 2006, the Lee County Health Department (CHD) reported 4 new additional cases.

Cluster 2: A tourist from the state of Washington presented to the ER and was treated and released for symptoms of nausea and tingling in hands and feet. The patient case is a 49 year old woman. Hospital records indicated she collected clams just offshore along the gulf side of Ft. Myers Beach from recreationally/illegally harvested shellfish. She cooked the clams, ate around midnight on July 9, and developed symptoms around 4 hours later on July 10. The Lee CHD has been unable to successfully contact the patient for interview.

Cluster 3: Three tourists from France (who also have a residence on Sanibel), presented to the emergency room. Mother, son and daughter-in-law developed neurological symptoms after consuming clams they collected just offshore along the

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gulf side of Sanibel Island (within a quarter mile of the GPS coordinates of cluster 1) from an area not open to legal shellfish harvesting. They were unaware of the red tide in the area. The mother was admitted to the ICU; the other two were treated and released. They ate the clams on July 10 around 8:30 p.m. and began having symptoms about four hours later, after midnight. Symptoms included muscle weakness, dizziness, and tingling/numbness of the extremities; the daughter-in-law also experienced abdominal pain and vomiting. These small clams were heated in a pan and served with spaghetti. Each person, ranging in age from 31-61 years, consumed ~ 50 clams. The mother has been released from the hospital and presently, all are in good condition.

On July 18, 2006, the Lee CHD reported three new cases, bringing the total number of cases to 11.

Cluster 4: A family of three (residents of Hillsborough County) presented to the ER on July 17, 2006 after they developed neurological symptoms one hour after consuming clams they collected just offshore along the gulf side of Sanibel Island (Middle Gulf Drive) from an area not open to legal shellfish harvesting. The father (45 years old) was admitted and was put on a ventilator due to preexisting health conditions (not due to NSP). His symptoms included nausea, diarrhea, tingling, dizziness and respiratory distress. He consumed ~ 30 clams. Mother and daughter experienced symptoms of nausea, tingling, swelling of the tongue and chest discomfort. The mother (44 years old) was treated and released; she consumed ~ 15-30 clams. The daughter (17 years old) was also admitted; she consumed ~ 5 clams. The clams were prepared as a broth and served warm. There was one leftover clam that was shipped to the Florida Fish and Wildlife Research Institute for analysis along with urine and blood serum from the three cases.

On July 19, 2006, the regional environmental epidemiologist received two additional reports of NSP cases from the Florida Poison Control in Miami, bringing the total number to 13 cases.

Cluster 5: The Lee CHD interviewed the two patient cases (Miami residents) who were vacationing on Sanibel. Both cases (male and female) are 45 years old. They collected and consumed the clams on July 18 (same basic location as the others) and both experienced symptoms of nausea, vomiting, diarrhea, tingling, abdominal pain, weakness and flush feeling but felt cold within two hours of consumption. They did not seek medical care. Duration of illness was 18 hours. The clams were boiled and they do not know how many they consumed. No leftover clams were available.

The Lee CHD has made efforts to disseminate information to the public regarding the risks of harvesting shellfish in these unclassified (unapproved) waters. The Lee CHD sent an email to county/city government and local tourist bureaus to make them aware of the danger, and also worked with the tourist bureaus to help contact realtors and hotel/condo complexes to disseminate warnings to abstain from harvesting local shellfish (see below). There were articles in the *News Press* on July 8, 10, 18, and 19, 2006 but many tourists do not read local papers. The shellfish poisonings were also reported on the local TV news on July 13.

In addition to the press release, the city manager of Sanibel sent police officers door-to-door delivering the warning to not harvest or consume shellfish. They also activated their reverse 911 system with the same message and posted signs at beach access points. Flyers were passed out at local toll booths. An alert message on EMS system was posted on July 18 for emergency departments in the region. An interview with Robert South (Lee CHD epidemiologist) was broadcast on the local evening news on July 18 and on morning and evening news on July 19. Information was also posted on EpiCom.

Discussion

Neurotoxic Shellfish Poisoning is a notifiable disease in Florida (s. 64D-3.002 (1) qq, Florida Administrative Code). The illness is caused by eating shellfish that have accumulated brevetoxin and its derivatives. The main symptoms include tingling and/or numbness of the lips, tongue, throat, hands and feet. Symptoms tend to be mild and resolve quickly and completely. Onset of this disease occurs within a few minutes to a few hours; duration is fairly short, from a few hours to several days. Recovery is complete with few sequelae; no fatalities have been reported.

Cases of NSP in Florida are often misdiagnosed as Paralytic Shellfish Poisoning (PSP), which can cause a much more serious illness that can result in death. According to the Florida Marine Research Institute, no algal species that cause PSP have been verified in the Gulf of Mexico

According to the Florida Department of Agriculture and Consumer Services, Bureau of Aquaculture Environmental Services, the waters where recreational clam harvesting has taken place are never open to any commercial or recreational harvesting of oysters, clams, or mussels. The Pine Island Sound Shellfish Harvesting Area is the nearest "open" (conditionally approved areas) shellfish harvesting area near Sanibel Island. All other waters in this general area are "always closed" to all recreational and commercial shellfish harvesting (this is considered a criminal violation, issued by FWC Division of Law Enforcement and includes the destruction of any shellfish). See <http://www.floridaaquaculture.com/pdfmaps/62.PDF>

Similar NSP incidents have occurred previously in Florida from self-harvested shellfish. In 2005, four Charlotte County residents (associated with clams); in 2001, two Sarasota County residents (associated with oysters); in Sarasota County in 1996, three tourists (a Vietnamese family) (associated with clams and whelks); and, in 1995, two tourists in Lee County (associated with clams off Sanibel Island on Gulf Drive).

Recommendations

Shellfish should, under no circumstances, be harvested from unapproved areas. To promote community educational efforts and for future red tide events it might be useful to have PSAs and other information ready for distribution, including the fact that cooking these shellfish does not eliminate the toxin. One suggestion may be to post signs in all rental units, warning the public about the risks and legal considerations of self harvesting shellfish, including contact information for the public to obtain additional information.

Information on the status of red tides in Florida can be obtained from the Florida Fish and Wildlife Research Institute website at http://www.floridamarine.org/features/category_sub.asp?id=4434. Information on the harvesting status of shellfish beds in Florida can be obtained at <http://www.floridaaquaculture.com/>. Click on Shellfish Harvesting, then click on the drop down menu arrow and choose Shellfish Harvesting Daily Area Status.

Robin Terzagian is a regional environmental epidemiologist for the Food and Waterborne Disease Program at the Bureau of Community Environmental Health. She is located in Ft. Myers and can be reached at 239.338.2744.

CDC Introduces New Website

by Jaime Forth

The Centers for Disease Control in Atlanta has developed a new website dedicated to promulgating information and resources for Legionnaire's Disease and Pontiac Fever.

The site, located at <http://www.cdc.gov/legionella/>, contains specific information which will be helpful to health department practitioners in evaluation and management of cases. Among other tools, it provides sample questionnaires, interview forms, and sampling and testing protocols.

Legionellosis is a form of lung infection caused by the bacteria *Legionella*, normally found in water or water droplets. Eight thousand to 18,000 people are hospitalized each year with this illness, which got its name in 1976 after an outbreak occurred among many of the people who attended an American Legion convention in Philadelphia. Disease symptoms can be confused with pneumonia and include chills, high fever, and cough, muscle aches and headaches. Pontiac Fever, which does not lead to pneumonia, is the milder form of this infection.

Legionellosis, which is a reportable disease in Florida, is contracted by breathing mists or vapors contaminated with *Legionella*. The bacteria do not, however, spread from person to person. Most outbreaks have been associated with cruise ships, spas, and cooling units such as air conditioners.

Jaime Forth is managing editor of Epi Update and can be reached at 850.245.4444, ext. 2440.

Cryptosporidiosis Outbreak in a Nassau County Travel Group Returning from Ireland, May 24, 2006-June 4, 2006

by Rebecca Lazensky, MPH and Kim Geib, MSN, ARNP



www.discoverireland.com

Background

The Nassau County Health Department (NCHD) received a call on June 8, 2006 from a physician who traveled with a local choral group to Ireland from May 24 to June 4. He reported gastrointestinal illnesses in approximately 19 of the 41 travelers with an onset of 1-3 days after returning. According to the physician, the predominant symptoms were diarrhea, abdominal cramping, vomiting, and low grade fever. He was concerned about the sanitary conditions on their return transatlantic flight. There were multiple reports from travel group members of unsanitary plane conditions such as long lines to the bathroom (15 people), debris and toilet paper in the aisles, clogged toilets, overflowing sinks, and wet floors and toilet seats. Initial survey information coupled with an apparent incubation time similar to Norovirus and the travelers' symptoms, suggested a Norovirus-like illness.

On June 9, the NCHD epidemiology team began administering a telephone questionnaire to the travel group and one household contact with a similar GI illness. The questionnaire was developed to examine possible water exposures, common meals, and food, travel, and clinical histories. Based on the preliminary survey data, a case definition for ill travelers was developed. A probable case was an individual who traveled with the group to Ireland and had an onset of severe diarrhea (greater than three loose stools in a 24 hour period), and/or two or more of the following symptoms: vomiting, nausea, bloating, cramps, abdominal pain, myalgia, cramps, fever ($\geq 100^{\circ}\text{F}$), chills, and an onset from May 25 to June 16, and/or epidemiological linkage to a confirmed case. A confirmed case was considered to be a person with symptoms compatible with the case definition who was also pronounced laboratory-confirmed positive for *Cryptosporidium*.

A Shift in the Investigation At the beginning of the investigation, the epidemiology team's primary suspicion was a possible point-source exposure of norovirus on an airplane. Prior to the investigation, the local physician who reported the outbreak had submitted a stool sample to his doctor. Results were received on June 9, and they were positive for *Cryptosporidium* antigen. In addition, there were anecdotal reports of illness among travel group members who did not return home on the same transatlantic flight. Travelers who returned on the group flight on June 4 were classified as Group 1 (32). The travelers who stayed in Europe past June 4 were classified as Group 2 (9). Five Group 2 members were ill with a similar GI illness. Due to the illness in Group 2 and the physician's positive *Cryptosporidium* antigen lab report, the primary focus of the investigation shifted from a potential Norovirus outbreak on a plane to a point-source *Cryptosporidium* exposure in Ireland.

Travel Histories The travel group performed at several churches and at a dinner theater in Ireland between May 24 and June 4. All members of the group were Nassau County residents, predominately retirees. During the majority of the trip, they traveled together, stayed at the same four hotels, and had a group meal plan which included breakfasts at the hotel and five group dinners. Four group dinners were at their hotels, and one dinner was held at a dinner theater prior to their choral performance. Dining options were from a fixed menu where the group had three choices for an appetizer, side dish, main course, and dessert. The group dinners occurred on May 25, May 27, May 27, May 31 and June 3. During the five group dinners, all members were in attendance except for the June 3 meal, during which one person left early to travel to another destination. There were no snacks or refreshments served at the churches where the travel group performed. When the travel group was surveyed about common meals, there were no meals where greater than 50% of the travel group was present with the exception of the five group dinners.

Survey Results Data were analyzed using Epi Info 2005 software (CDC), Atlanta, GA. The demographics of the travel group are as follows: Twenty-five (62.5%) were female, 15 (37.5%) were male. All persons were white, non-Hispanic. The mean age was 64.8 years (range: 23-79). Illness onset dates range from June 4-8. The epidemic curve is consistent with a point source epidemic (Figure 1).

A total of 41 people from both groups attended the group trip to Ireland, of which 40 were surveyed. Group 1 consists of the 32 people who returned home on June 4 and Group 2 consists of the 9 people who stayed in Europe to travel. All persons in Group 1 were surveyed and eight of the nine people in Group 2 were surveyed. Of the 32 people surveyed in Group 1, 24 reported being ill with GI illness. Of the eight people surveyed in Group 2, five reported being ill with GI illness. The attack rate in Group 1 was 75% and in Group 2 it was 62.5%.

The following symptoms were reported in the 29 ill travelers: diarrhea (93.1%), bloating (84.6%), gas (78.6%), body aches (55.2%), nausea (53.6%), headache (53.3%), cramps (51.7%), abdominal pain (48.3%), chills (25.9%), fever (14.3%), and vomiting (13.8%) (Table 2). Of the 27 persons who reported diarrhea, the composition was as follows: bloody stools (2); mucous in stools (4); watery stools (24). The mean number of loose stools that persons reported in a 24 hr period was 6.7. Thirty-one percent (9) reported illness for 1-3 days, 55.1% (16) for 4-6 days, and 13.7% (4) for 7 or more days. When surveyed about activities over the last 30 days, eight persons reported recreational water exposure, while 31 were unexposed. None of the travelers lived in an assisted living facility, visited a daycare center, or worked in the food service industry.

Several days into the investigation, the NCHD was informed by the trip organizers that the travel group may have had exposure to water from a private well while at a remote dinner theater/restaurant. The group meal occurred at a 150 year-old establishment in a rural location in Killarney, Ireland, located at the foot of a mountain. Farm animals and horses were reportedly on the premises. Travel group members mentioned that soft drinks were not available. They had a choice of either water or an alcoholic beverage. Many people chose to drink water rather than their usual beer or wine, since they were singing that night after dinner. There were multiple pitchers (4-5 per table) of tap water with ice on the tables.

Analysis of survey data shows a strong association between drinking water at the dinner theater/restaurant in Killarney and developing illness. The dinner occurred on May 31, seven days before the peak of the onset dates, which is consistent with the incubation period of *Cryptosporidium* (average 7-10 days) (1). The risk in the exposed (those who drank the water at the dinner theater) was 96.6% with a 95% CI of 81.37, 100. The risk in the unexposed was 16.7% with a 95% CI of 1.136, 58.22. The risk ratio was 5.79 with a 95% CI of .97, 34.71, meaning that those who drank water at the dinner theater were 5.8 times more likely to develop illness. The overall risk of drinking water and developing GI illness was 82.9%, 95% CI (66.94, 92.28).

Based on survey food and drink histories, the common meal on June 3 was eliminated as a source of the outbreak, since no food or drink items proved to be epidemiologically significant (Table 1). Also, one of the group who left prior to the meal had also developed a GI illness. In addition, the onset dates and average incubation time for *Cryptosporidium* likely implicates an earlier group meal.

Lab Results Forty-one stool specimens were solicited and sent to the Florida Department of Health's state laboratory in Jacksonville for enteric, ova and parasites, and viral (Norovirus) testing. Six samples were tested using viral real time RT-PCR assay tests to detect type G1 or G2 Norovirus; all were negative. Fourteen samples were tested using acid fast staining techniques for ova and parasites, and cultured for bacterial enteric pathogens. On June 15, the NCHD received five positive lab results for *Cryptosporidium* species (oocysts), which included the initial physician's sample. Seven additional stool samples were sent to CDC's Division of Parasitic Diseases in Atlanta, GA for PCR speciation and genotype testing. Of the five samples, all tested positive using DFA testing for *C. parvum* and all tested negative for *C. hominis*. The *C. parvum* species is animal in origin and is often spread through an environmental contamination with animal feces. The results from a Luminex post-hybridization test yielded five positive samples which were subtyped as IlaA16G1R1b, a strain that the CDC's Division of Parasitic Diseases scientists had only detected twice this year. In both cases, the strain originated in human specimens from Northern Ireland.

Discussion

Cryptosporidium is transmitted via the fecal-oral route. The average incubation period is seven days, with a range of 1-12 days. *Cryptosporidiosis* in humans is caused by ingestion of *Cryptosporidium parvum*, a protozoan parasite that infects the epithelial cells of the human GI, respiratory, and biliary tract. (1) In adults, the primary symptoms are watery diarrhea, cramping, abdominal pain, and to a lesser extent fever, anorexia, malaise, fever, and vomiting. (1) Also, bloating, foul-smelling stools, and intermittent diarrhea are commonly reported. Symptoms generally cease within one month, except in immunodeficient persons. Sources of past outbreaks have included recreational water parks, lakes, ponds, public and private water supplies, and contaminated beverages. The resistance of *Cryptosporidium* oocysts to chlorine and disinfectants leaves a variety of water sources vulnerable to contamination. (2)

NCHD consulted with the CDC regarding follow-up procedures and public health inspections of facilities. Personnel at the CDC's Division of Parasitic Disease recommended that the NCHD communicate on the investigation with the overseeing authorities in Ireland, to prevent additional cases of disease. Following the CDC's provision of a contact in Ireland, the NCHD contacted the Health Protection Surveillance Centre in Dublin on June 20, which directed them to the Regional Public Health Officials in Cork. which oversees the Killarney area. Public health services in Ireland are managed by the Health Services Executive and divided in four administrative areas; Killarney is Health Services Executive: South. (3)

The Irish Public Health Officials in Dublin and Cork informed the NCHD that there was no increase in *Cryptosporidium* cases in Ireland. Officials also reported that there was no increase in case reports from return travelers to Ireland. Irish public health officials said that they completed an inspection of the facilities at the dinner theater and found that the water

supply met their standard for potable water which is set by the European Union, and enforced by Ireland's 34 local sanitation authorities. The facility had a regulated public water system which was approved by the Irish sanitation inspector. The inspector reported that the restaurant's proprietor had both a private well and a publicly regulated water source, but claims to use only the public source for restaurant operations.

One limitation to this study is possible recall error, which hindered the collection of food history data and made it difficult to eliminate all other possible exposures in Ireland. Information on the water source at the dinner theater led to an addendum to the survey regarding beverages consumed at the dinner theater/restaurant in Killarney, but attempts to gather additional exposure information were unsuccessful because of the significant amount of time (four weeks) that lapsed before travelers were re-surveyed.

Recommendations

Cryptosporidium oocysts can remain in the stool for several weeks after the symptomatic period, which is generally one to two weeks.⁴ Therefore, the health department recommends that infected individuals use sanitary precautions such as washing/disinfecting hands, bedding, sheets, towels, and common household areas. Symptomatic persons should avoid preparing food for others, or visiting group settings such as daycare centers, assisted living facilities, and recreational water parks for at least three weeks after their last day of symptoms. Public health interventions during a Cryptosporidium outbreak provide an opportunity to limit further transmission of the organism through educating about healthy behaviors, inspecting contaminated facilities, and promoting public health partnerships.

Through collaboration with the Irish public health officials, this investigation evolved into a joint effort in which both entities conducted segments of the investigation within their own territories. The NCHD provided Irish public health officials with the names of hotel restaurants where the other group meals were consumed. Irish public health officials reported that these facilities would be inspected according to their standards. Although laboratory testing confirmed that the outbreak originated in Ireland and the water at the dinner theater was most probable source (given the available exposure information), the exact exposure responsible for the cases of illness is not confirmed. Further investigation by Irish public health officials is necessary to examine a possible cross-contamination of the restaurants' water (public and private water sources) as well as an evaluation of other possible exposures. When working with public health partners, the complexities of the investigation become a shared responsibility. Communication, information sharing, and enhanced diplomacy proved essential in an effort to investigate an outbreak across international borders.

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Figure 1. Onset dates of cases in Cryptosporidium outbreak in return travelers (Groups 1 and 2)

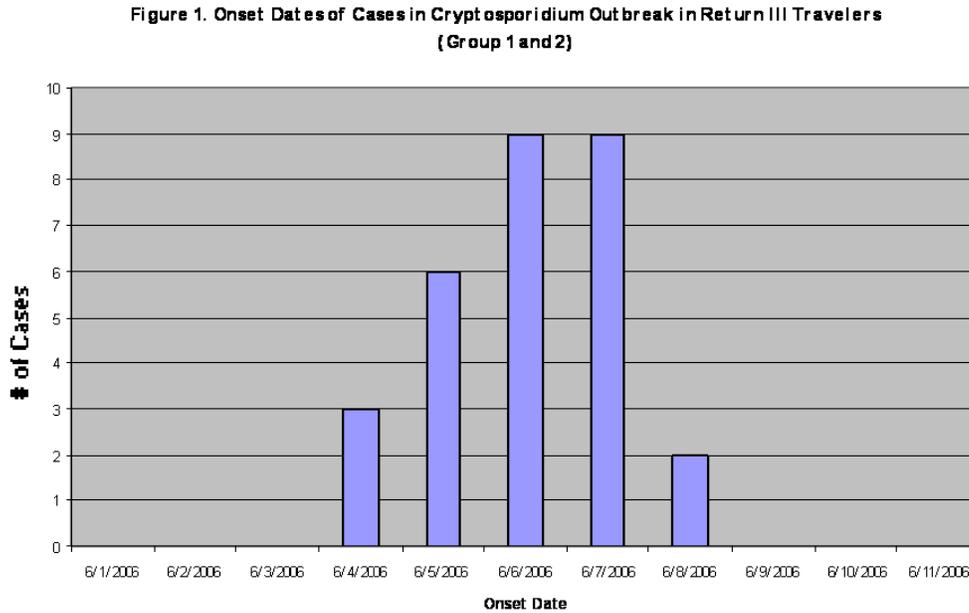


Table 1. Items consumed at June 3 group meal at hotel.

Table 1: Items Consumed at June 3 rd Group Meal at Hotel	Risk Ratio	Confidence Interval	Attack Rate %
Alcoholic beverage	1.01	69-1.48	71
Cauliflower and cheese	0.78	.52-1.17	63
Chicken with bacon	0.89	.56-1.40	67
Chicken without bacon	1.39	1.14-1.70	---
Chocolate mousse	0.79	.51-1.22	63
Coffee	1.18	.78-1.79	83
Cream of vegetable soup	1.10	.72-1.66	78
Fish sampler	0.96	.65-1.41	71
Fruit	0.44	.09-2.45	33
Ice	1.82	.86-3.84	81
Lamb	0.86	.58-1.28	67
Lemon wedge	0	0	--
Melon	1.31	.94-1.84	89
Mixed vegetable	1.19	.73-1.95	76
Orange wedge	0	0	--
Plum madeira	0.75	.39-1.47	57
Potato	1.39	.75-2.58	77
Salmon	1.18	.78-1.79	83
Soft drink	0	0	--
Tea	0.34	.03-3.77	--
Toffee panna cotta	1.40	.98-2.01	88
Water	1.84	.77-4.40	79

Table 2. Symptoms

Table 2: Symptoms	Percentage with Symptom	Average Duration of Symptom (days)
Diarrhea	93.1%	3.4
Bloating	84.6%	3.3
Gas	78.6%	3
Body aches	55.2%	3.2
Nausea	53.6%	2.9
Earache	53.3%	3.2
Cramps	51.7%	3.4
Abdominal pain	48.3%	3.3
Chills	25.9%	2.5
Fever	14.3%	2
Vomiting	13.8%	1.3

Mosquito-borne Disease Summary October 1-7, 2006

Rebecca Shultz, MPH, Caroline Collins, Daneshia Roberts, Carina Blackmore, PhD

During the period October 1-7, 2006, the following arboviral activities (St. Louis Encephalitis [SLE] virus, Eastern Equine Encephalitis [EEE] virus, Highlands J [HJ] virus, West Nile [WN] virus, California Group [CE] virus) were recorded in Florida:

EEE virus activity: One live wild bird collected in Santa Rosa County tested positive for antibodies to EEE virus. A total of 22 counties have reported EEE virus activity so far this year, compared to 50 at this time last year.

WN virus activity: Three seroconversions to WN virus were reported in sentinel chickens from Duval (1) and Nassau (2) counties. One live wild bird collected in Walton (North) County tested positive for antibodies to flavivirus. A total of 17 counties have reported WN virus activity so far this year, compared to 29 at this time last year.

SLE virus activity: One seroconversion to SLE virus was reported in a sentinel chicken from Sarasota County. A total of 4 counties have reported SLE virus activity so far this year, compared to 3 at this time last year.

HJ virus activity: None this week. A total of 5 counties have reported HJ virus activity so far this year, compared to 14 at this time last year.

No locally-acquired human cases of arboviral infection were reported yet this year.

Dead Bird Reports: The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, 26 reports representing 36 dead birds were received from 10 counties. Of the reported birds, two were identified as a type of corvid (both crows), three were identified as a type of raptor, and the remaining 31 were identified as other birds. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

See the web page for more information at <http://www.doh.state.fl.us/environment/community/arboviral/index.html>. The Disease Outbreak Information Hotline offers recorded updates on medical alert status and surveillance at 888.880.5782.



This Week on EpiCom

by Christie Luce

The Bureau of Epidemiology encourages Epi Update readers to not only register on the EpiCom system at <https://www.epicomfl.net>, but to sign up for features such as automatic notification of certain events at EpiCom_Administrator@doh.state.fl.us and contribute appropriate public health observations related to any suspicious or unusual occurrences or circumstances. EpiCom is the primary method of communication between the Bureau of Epidemiology and other state medical agencies during emergency situations.

- FDA announces findings from investigation of Foodborne E. coli 0157:H7 outbreak in spinach
- Chlorine release in Pinellas County
- Giardia and Cryptosporidium in Orange County
- Influenza at the Duval County hospital
- Botulism from carrot juice confirmed in Tampa

Christie Luce is administrator of the Surveillance Systems Section in the Bureau of Epidemiology. She can be reached at 850.245.4444, ext. 2450.

Weekly Disease Table

by D'Juan Harris, MSP

[Click here to review the most recent disease figures provided by the Florida Department of Health, Bureau of Epidemiology.](#)

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