



Outbreak of Pontiac Fever among Guests at a Hotel

By Gregory Huhn, M.D., M.P.H and T.M.

On August 12, 2002, the Stephenson County Health Department (SCHD) notified the Illinois Department of Public Health Rockford Regional Division of Environmental Health of reports of illness among family members from four families who stayed at a hotel in Freeport August 9 through 11, 2002. Thirty-one of 36 individuals reported high fever, headache, and muscle aches. Based on preliminary findings, exposure to the swimming pool, spa, and the swimming pool/spa enclosure were found to be common among the ill guests. The hotel voluntarily closed the swimming and spa facilities pending further investigation by SCHD, the Department's regional environmental health staff and the Rapid Response Team.

On August 14, 2002, Department staff initiated an environmental investigation of the hotel. Several 100 ml water samples were taken, including spa filter backwash water taken prior to superchlorination. Further samples taken included spa water, pool water, and water from the drinking fountain. Samples were submitted to the Illinois Department of Agriculture and to the Centers for Disease Control and Prevention (CDC) to be analyzed for the presence of Legionella bacteria.

Daily log records for spa water bromine and pH levels and approximate number of bathers were reviewed for August 9 - 11. Bromine levels were 3.5 and pH levels were between 7.4 - 7.5. The approximate number of spa bathers was estimated to be 95 - 115 persons. The spa was superchlorinated during this inspection to approximately 50 ppm of chlorine and recirculated. The spa filter was backwashed. The spa was drained, thoroughly cleaned, and then refilled prior to reopening, August 14. On August 26, 2002, resamples of the spa filter backwash water were obtained and cultured.

The Department was notified on August 30, 2002 by the Illinois Department of Agriculture that the initial

samples taken of the spa filter backwash water on August 14, 2002 were positive for *Legionella dumoffii*. Samples submitted to the CDC were positive for *L. micdadei* and *L. maceachernii*. On September 3, 2002, the hotel was advised that the results of the resampled cultures were again positive for *Legionella dumoffii* and the spa was voluntarily closed pending additional disinfection procedures. Superchlorination was performed and duplicate resamples were obtained on September 25, 2002 and sent to the Illinois Department of Agriculture. These duplicate resamples tested negative for *Legionella* species.

Hotel Guest Investigation

The Rapid Response Team developed a questionnaire for active case ascertainment for a retrospective cohort study of hotel guests and visitors who stayed at the hotel from August 9, the first date of hotel stay for index cases, through August 15, the date of completion of the initial environmental survey.

A case was defined as:

Any guest of the hotel who stayed or visited the hotel (or employee who worked at the hotel) from August 8 until the 15, 2002, who reported any of the following symptoms within two weeks of hotel stay: fever or headache with muscle aches.

The total number of guests during the study period was 380 from 23 states, Canada and Belgium. Public health officials from the states and Canada (officials from Belgium could not be contacted) were recruited via conference calls to administer the questionnaire to hotel guests within their jurisdiction by telephone or mail. SCHD administered the questionnaire to hotel employees. A differential diagnosis information sheet was distributed to public health officials and disseminated to care providers in communities who treated ill hotel guests. The information sheet provided instructions for performing diagnostic lab tests including nasopharyngeal swabs for adenovirus, influenza, coxsackie virus, and parainfluenza virus, sputum cultures, Legionella urinary antigen tests, and serology assays for acute and convalescent sera for Legionella.

Two-hundred four guests completed the questionnaire from 15 states and Canada for a response rate of 54 percent. Half of the respondents were from Illinois and 20 percent were from Wisconsin. A total of 68 guests met the case definition. One ill guest was hospitalized overnight. There were no ill employees. Median age of cases was 25 years (range 2-58 years) and 51 percent were female. Univariate and stratified analysis showed the most significant risk for illness was time spent in the enclosed pool/spa area, with a statistically significant relative risk of 11.2 (95 percent confidence intervals 5.4-23.2).

Lab results reported for cases were as follows:

Legionella urinary antigen tests: 0 of 14 positive
sputum: 0 of 7 positive for *Legionella*;
hemagglutination serology: two of 15 with four-fold increase of *Legionella micdadei* antibody titers

Summary

This investigation of febrile illness among guests at a hotel in Freeport from August 9-15, 2002, found evidence for multiple *Legionella* species in the spa filter backwash with exposure to the pool/spa area strongly associated with illness of probable Pontiac Fever and supportive serologic evidence of human disease caused by *Legionella* species. Pontiac Fever is a form of Legionellosis with flu-like symptoms that is not associated with pneumonia, with an incubation period of 5-66 hours, and usually self-limited in its disease course. Complete recovery may be expected in 2-5 days. Treatment is not required. The transmission route is unknown, though some have speculated that illness may be caused by a hypersensitivity reaction to inhaled *Legionella* antigen. There are more than 40 species of *Legionella* bacteria. Diagnosis of Pontiac Fever is usually based upon clinical findings, because laboratory diagnosis is difficult. *Legionella* species have never been isolated from case-patients with Pontiac Fever, however, four-fold elevations in IgG antibody titers to > 1:128 from acute to convalescent sera is considered confirmation of infection by CDC criteria. In this investigation, two cases demonstrated a four-fold elevation in polyvalent antibody titers from acute to convalescent sera, supportive of acute *Legionella* exposure, though no titers reached a level > 1:128 for laboratory confirmation. *Legionella* bacteria are typically found in aquatic bodies of water and hot water distribution systems. The CDC recommends

spas maintain bromine levels between 4-10 ppm for disinfection. During the weekend of August 9-11, 2002, the recorded levels of bromine from spa water were 3.5 ppm. Although a bromine residual of 3.5 ppm would be expected to provide adequate disinfection, it was probably depleted by heavy bather usage. It is believed that several factors may have contributed to this bacterial growth and subsequent illness, including spa temperatures averaging 104° F, bromine residuals consistently below 4.0 ppm, the length of time between filter backwashes, the filter backwash flow rate, and the length of time between complete spa drain down and refill.

The Department investigators recommended the following control measures:

- I. Maintain a bromine residual reading in the range of 4.0 ppm to 10 ppm.
- II. Provide a filter backwash facility that is designed so that flooding, overflowing or excessive splashing does not occur when the filter is backwashed at the required rate of 15 gallons per minute per square foot of filter area.
- III. Backwash the filter for two minutes at a frequency that is in accordance with the manufacturer's recommendations, but not less than weekly.
- IV. Completely drain, clean, and refill the spa as often as is necessary based on usage and bather loads, but not to exceed an interval of every week.
- V. Set the automated chemical control units to maintain ORP values in the spa water between 650 and 850 mV's. Clean and replace the controller probes per manufacturer's recommendations.

References

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West Nile Virus Surveillance in Illinois, 2002

By **Connie Austin, D.V.M., M.P.H., Ph.D.**

During 2002, the state of Illinois had the highest number of human cases of West Nile Virus (WNV) disease (N=884) and the highest number of fatalities (N=66) due to WNV in the nation. Of the 102 Illinois counties, 100 reported WNV activity in at least one bird, mosquito or horse. The first WNV positive bird was collected on May 2 in Kane County. The first WNV positive mosquito pool was collected on June 19 from Cook County. The total WNV positive results in 2002 included 1,237 horses, 884 humans, 624 mosquito pools, 517 birds and 12 other mammals (e.g., squirrels and canids).

From May 2002 through January 2003, the Department's laboratory performed IgM antibody capture ELISA tests (MACELISA) on human acute and convalescent serum and CSF specimens submitted for arbovirus testing. The Department's laboratory tested 9,497 human specimens for WNV, St. Louis encephalitis (SLE), Eastern Equine encephalitis (EEE) and California encephalitis (CE). Samples were positive for the following arboviruses: 1,516 specimens were positive for WNV (884 individuals), 10 for CE and one for SLE. Seventy-three percent of cases were hospitalized. The median age was 56 and the cases ranged from an infant to a 97-year-old. On presentation, 334 (38 percent) cases had WNV fever, 320 (36 percent) had encephalitis and 230 (26 percent) had aseptic meningitis. Almost three quarters of the WNV cases were residents of Cook County.

Dead crows and blue jays were collected from May 1 through October 15, 2002. Of the 793 dead birds tested, 517 (65 percent) tested WNV positive. Dead birds were submitted from 98 counties in Illinois and positive birds were identified in 96 counties.

In 2002, 1,237 horses (74 percent) tested positive for WNV of 1,674 tested. Ten squirrels, one dog and a wolf tested positive for WNV and had clinical illness. Squirrels tested positive in at least three counties.

References

R. Petersen, A. Marfin, West Nile Virus: A Primer for the Clinician, *Annals of Internal Medicine*, 2002;137:173-9.

Surveillance Is Information for Action!

Q: What public health action is triggered when a case of pertussis is reported to the local health department?

A: Pertussis is reportable so that health care and public health workers can attempt to interrupt its transmission in the community through treatment of cases (especially early in the course of disease) and through identification and prophylaxis of close contacts. Failure to report a case of pertussis (whooping cough) could contribute to further transmission of the disease in the community. While an older person may have a mild disease from the infection (no whooping, just a chronic cough), an infant who contracts pertussis can develop severe illness. Pertussis is reportable by telephone to a local health department as soon as possible and within 24 hours of diagnosis.

Health care providers are strongly encouraged to report suspected cases of pertussis to the local health department even before confirmation is obtained. Local health departments can offer advice on test methods and appropriate treatment, including respiratory isolation of pertussis cases until they have received at least five days of a 14-day course of an effective antimicrobial agent. Local health department staff also may gather information about the immunization status of the case and the close contacts of the case. However, prophylaxis is recommended for all close contacts of a pertussis case regardless of age and vaccination status. In addition, the local health department may need to recommend the exclusion of inadequately immunized household contacts under 7 years of age from schools, day care, and public gatherings for 14 days after their last exposure to a case or recommend excluding cases and contacts until they have received at least five days of the 14-day course of an appropriate antimicrobial agent. Finally, reporting allows public health departments to study the epidemiology of the disease, identify localized regions of persistent activity and monitor the success or failure of prevention efforts through trends in surveillance data. For more information, see the Rules and Regulations for the Control of Communicable Disease and Ill. Adm. Code 695 and 690.

A University Conjunctivitis Outbreak that Eluded Laboratory Characterization

By Doug Pasarro M.D., M.P.H.*

A large conjunctivitis outbreak occurred on a university campus in Evanston, during the spring semester of 2002. At least 223 cases were identified when they sought care at the university health center. The Evanston Health Department and the Illinois Department of Public Health's Rapid Response Team conducted a joint investigation. A combination of e-mail and traditional telephone-based surveys demonstrated that wearing contact lenses was a risk factor for conjunctivitis, and specifically for conjunctivitis involving both eyes. Conversely, persons who wore eyeglasses were less likely to develop conjunctivitis than those who did not. Laboratory and epidemiological evidence suggested that the outbreak was caused by a viral pathogen. However, the etiology was not determined, despite extensive culture and PCR-based testing by the laboratories of the Illinois, Wisconsin, and California state health departments as well as laboratories of the Centers for Disease Control and Prevention. Enhanced laboratory surveillance (for example, taking conjunctival and throat swabs from a representative sample of conjunctivitis patients during small and medium-sized outbreaks) could help clinicians and public health officials to identify new causes of this disease. Notably, 64 (97 percent) of 66 students enrolled in one telephone-based study owned their own computer. Extensive use of the Internet during this outbreak allowed the university and the local health department to collect data and to provide the public with information much more efficiently than by traditional means. During outbreaks in which computer access is generally available (i.e., among students or employees), e-mail surveys can help public health officials to efficiently access information not easily collected by traditional telephone or face-to-face studies. Furthermore, e-mail and the World Wide Web are effective strategies for disseminating prevention recommendations, such as the need for improved hand and contact lens hygiene during conjunctivitis outbreaks.

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Factoid Hepatitis A: Fecal excretion of hepatitis A virus reaches maximal levels at the time of peak transaminase elevation and then decreases rapidly as jaundice appears. Usually, hepatitis A patients are infectious for up to three weeks before and approximately one week after the appearance of jaundice.

Upcoming Events

- ✓ **12th Annual HIV/STD Conference**
November 4-6, 2003
Renaissance Hotel, Springfield, Ill.
Contact Kate Mackz, 217-558-4199 or
kmackz@idph.state.il.us
- ✓ **Incorporating HIV Prevention into the Medical Care of Persons Living with HIV**
November 13, 2003, 1 p.m. - 3 p.m.
More information:
<http://www.cdcnpi.org/broadcast> or
CDC Fax System 888-CDC-FAX (or 877-232-1010 for the hearing impaired) and enter document #130042 when prompted.
- ✓ **2004 National STD Prevention Conference**
March 8-11, 2004
Philadelphia Marriott Hotel, Philadelphia, Penn.
More information: www.stdconference.org

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