

Multistate Outbreak of Legionellosis Associated with an Arkansas Hotel—Summary of Oklahoma Cases

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Legionellosis is a disease with two distinct clinical forms. Legionnaires' disease (LD) is characterized by pneumonia and influenza-like symptoms, including anorexia, malaise, myalgia, headache, rapidly rising fever, and chills. Pontiac fever (PF) is a milder illness with the same symptoms as LD, but without pneumonia. Both are caused by *Legionellae spp*, which are ubiquitous in natural and man-made aquatic environments and multiply in the presence of warm temperatures. The disease is transmitted primarily by aerosolized water, such as air conditioning cooling towers, humidifiers, whirlpool spas, and respiratory therapy devices.

On July 19, 2006, the OSDH Communicable Disease Division (CDD) was notified by the Arkansas Department of Health and Human Services (DHHS) Division of Health (DOH) of two persons suspected of having LD following travel to Arkansas, as well of reports of others with respiratory symptoms. Both persons with suspected LD were adult relatives of children participating in a weeklong baseball tournament in Arkansas. All members of the Oklahoma baseball team stayed at the same hotel in Arkansas. Families arrived on or around July 9 and departed on or around July 15.

In response, Oklahoma State Department of Health (OSDH), the Arkansas DHHS-DOH, and 26 other state health departments, investigated the outbreak. A comprehensive report entitled *Final Report, Legionellosis Oubreak, Arkansas, July 1-19, 2006* was prepared by the Arkansas DHHS-DOH.

Sixty-five Oklahoma residents were found to have stayed at the hotel during the period of interest (July 1-19), 34 of whom were associated with the youth baseball team. Fifty-four (83%) of the 65 Oklahomans were locatable and consented to be interviewed. A total of 16 persons met the case definition for legionellosis, including 2 people that met the case definition for LD, and 14 individuals that met the case definition for PF (overall attack rate 24.6%). Cases reported an onset of symptoms from July 2 through July 17. Fifteen of 16 persons meeting the case definition of legionellosis were members of the baseball team. Of the 14 persons that met the PF case definition, 14.3% sought medical care from a private physician. Both LD cases were hospitalized.

A retrospective cohort study of the baseball team and family members who traveled with the team was conducted. Thirty-eight of 46 (82.6%) members of the cohort reported entering the hotel pool/hot tub area. All cases reported visiting the area. Cases were significantly more likely to have visited the pool area than non-cases (RR 1.57 95% CI 1.25-2.00). Additionally, swimming pool use (RR 1.57, 95% CI 1.13-2.17) and hot tub use (RR 1.84,

95% CI 1.25-2.71) were each significantly associated with development of legionellosis.

Significant dose-response relationships were identified between the number of times guests swam in the hotel pool (Mantel-Haenszel $X^2 = 10.3$, $P = .0013$), or used the hotel hot tub (Mantel-Haenszel $X^2 = 15.8$, $P < .0001$) and development of illness. The median number of times cases used the pool was 4 (range 0-12 times) compared to 0 times among non-cases (range 0-7 times). Cases used the hot tub a median of 3.5 times (range 0-10) while non-cases used the hot tub a median of 0 times (range 0-6). The median time in hours cases spent in the pool was 2.5 hours (range 0-14 h), while the median time in non-cases was 0 hours (range 0-14 h), which was statistically significant (Wilcoxon rank-sum two-sided $p = 0.0034$). The median time of hot tub exposure was 0.6 hours (range 0-4h) and 0 hours among non-cases (range 0-2 h), which was also significant; (Wilcoxon rank-sum two-sided $p = 0.0002$).

A logistic regression model examining all of the above water exposures was constructed in order to determine the contributions of each exposure while simultaneously adjusting for their effects. When this was done, only the number of times a person entered the hot tub was found to significantly predict the likelihood of being a case (OR 2.13 95% CI 1.35-3.37), thus, each time a person used the hot tub, his or her odds of acquiring legionellosis were increased 2.13 times.

Results from the Oklahoma outbreak investigation revealed development of legionellosis (PF or LD) was associated with exposure to the indoor pool area, particularly the hot tub, at this Arkansas hotel. This finding was similar to that of the Arkansas DHHS-DOH, whose multivariate analysis revealed significant dose-response relationships between swimming in the hotel pool, using the hotel hot tub, and duration of time in the pool area and development of illness.

Outbreak of Norovirus in a Canadian County Long-Term Care Facility, October 2006

Prepared by Renee Powell, M.P.H.

The long-term care division contacted the CDD on October 6, 2006 regarding a potential outbreak of gastroenteritis in up to 50 residents. The facility was located in Canadian county and provided three levels of care including independent living, assisted living, and a nursing home. An outbreak investigation was initiated to document attack rates among residents, describe the occurrence of gastroenteritis among the three residential care areas, confirm the etiologic agent, and work with the staff to institute control measures. Infection control measures, environmental cleaning, and recommendations for active surveillance for new cases of gastroenteritis were provided and implemented by the staff at that time.

Thirty-seven cases of diarrheal illness (greater than or equal to 3 loose stools in a 24-hour period) were identified among residents and 12 among the staff resulting in an attack rate of 13.6% (37 of 272) and 18.2% (12 of 66). Onsets occurred on October 6th to October 7th. The duration of symptoms ranged from 24 to 48 hours in residents and employees. In the independent living center, the attack rate in residents was 13% (26 of 200). In the assisted living center, the attack rate in residents and employees was 23% (6 of 27) and 26% (6 of 26) respectively. The attack rate among the nursing home residents was 13.3% (6 of 45) and 12.5% (5 of 40) among employees. Symptoms reported among ill individuals were diarrhea, vomiting, fever and abdominal pain.

Four specimens were submitted from residents to the PHL, two from the assisted living center and two from the nursing home. Of those, one was positive for norovirus. The early recognition of the outbreak and initiation of control measures resulted in reduced spread of disease in the institution.

