Outbreak of Rhinovirus in a Long-Term Care Facility — Shawnee County, July 2015

Background

On July 2, 2015 at 11:51 AM, the Kansas Department of Health and Environment's Infectious Disease Epidemiology and Response section (KDHE) received a report from a long-term care facility (LTCF) in Shawnee County of a respiratory illness affecting 21 residents. At 12:07 PM, KDHE notified the Shawnee County Health Agency (SCHA) and immediately began a joint outbreak investigation to determine the cause and scope of illness. At 3:27 PM KDHE notified the Kansas Department for Aging and Disability Services (KDADS).

Methods

SCHA contacted the LTCF's Director of Nursing to obtain a line list of ill residents and staff. Information collected included symptoms, illness onset date, laboratory test results, room number, and illness recovery date. A case was defined as a respiratory illness with a cough in a LTCF resident between June 14, 2015 and July 9, 2015.

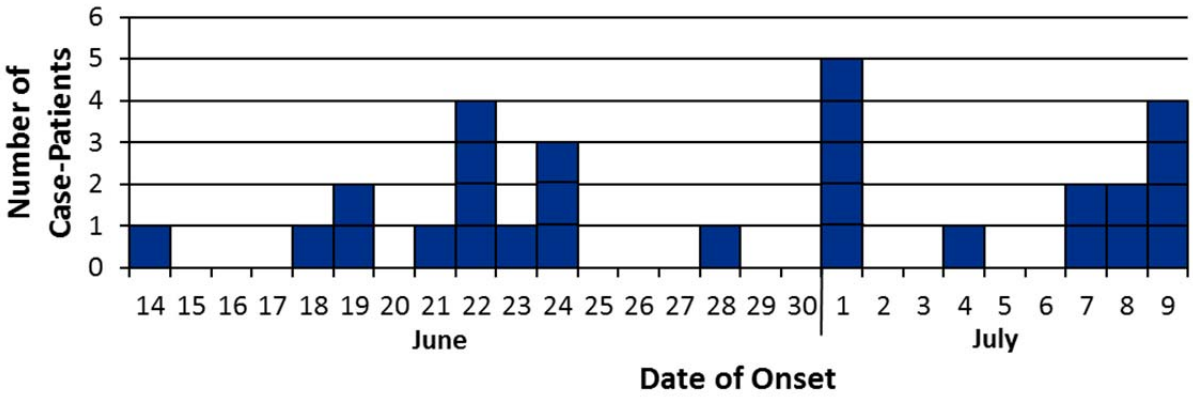
The LTCF collected 10 nasopharyngeal swabs and sent them to the Kansas Health and Environmental Laboratories (KHEL), where molecular testing was performed using a respiratory viral panel (RVP) capable of detecting twelve respiratory viruses. All specimens were forwarded to the Centers for Disease Control and Prevention (CDC) for confirmatory testing and typing.

Results

The first case-patient became ill on June 14, 2015. Upon notification of the outbreak on July 2nd, measures aimed at preventing the spread of infection were recommended and included

promoting hand hygiene among staff, residents, and visitors; implementing respiratory precautions for persons suspected of having a respiratory infection; and cancelling group activities. The last case-patient became ill on July 9, 2015. The outbreak was declared over on July 26, 2015, after two incubation periods had passed (6 days), after the resolution of symptoms (11 days after onset), from the final case-patient. By the end of the outbreak, 28 ill residents were identified. No staff members met the case definition.

Figure 1: Case-patients by date of illness onset (n=28)



All 28 case-patients reported a cough. Hospitalization occurred in eight case-patients and two deaths were reported. However, only one person's death was attributed to respiratory illness. The other death was attributed to an unrelated cause.

Ten nasopharyngeal swabs were collected. Six were tested at KHEL using a respiratory viral panel. Rhinovirus/enterovirus was detected in one specimen. All ten specimens were forwarded to CDC for further testing. The specimen that tested positive at KHEL was determined to be human rhinovirus A8 and two of the specimens not tested at KHEL were positive for human rhinovirus A8 and A51. All other specimens tested negative for a viral pathogen.

Conclusions

This respiratory illness outbreak was attributed to human rhinovirus. Eight of the 28 cases were hospitalized. One death that occurred during the outbreak was attributed to respiratory illness and one other death was attributed to an unrelated cause.

Rhinoviruses and coronaviruses are the most frequently identified causes of the "common cold" syndrome. Rhinoviruses are members of the Picornaviridae family. A self-limited upper respiratory tract illness is the usual clinical manifestation of infection with these viruses.

However, over the past three decades, several studies have found these viruses to be associated with clinical syndromes that require hospital care.[1] Rhinovirus may be ubiquitous in the health care worker and visitor populations who have contact with these residents but can cause serious illness and death in the elderly or immunocompromised populations.

Among the factors of this investigation that potentially contributed to stopping further transmission of this illness were the partnerships between the health agencies and the participation by the facility in the investigation. The public health agencies were able to rapidly provide tools so that the facility could immediately use them to quickly identify case-patients. Also, the facility continuously provided information to public health agencies involved about newly identified cases. Early in the investigation it was identified that spatially, and in time, that a majority of cases were among residents that either shared rooms or that attended a regular scheduled weekly gathering. Simple evidence-based interventions were implemented that were aimed at preventing person-to-person transmission, like teaching hand-hygiene and cough etiquette to the staff and residents; isolating ill residents; and the temporary cancellation of a regularly scheduled weekly gathering. Shortly after the interventions were implemented the outbreak ended.

A challenge encountered in this investigation was that the initial notification by the facility to a public health agency occurred nineteen days after the initial case's onset and after nineteen cases had occurred. Another challenge encountered in outbreak investigations of respiratory illnesses in this type of setting is that residents often have chronic or intermittent symptoms of cough due to other, non-infectious, causes. A more specific case definition could have aided in identifying cases more accurately and could have potentially aided in identifying when the beginning and end of the outbreak occurred. However, due to this illness' non-specific symptoms and the inability to obtain accurate RVP test results for specimens collected more than three days after illness onset, it was not possible to have a more specific case definition. To assist in determining the beginning and ending of the outbreak it was necessary to rely on the clinical expertise of staff associated with the residents care to ascertain when the cough illnesses were likely due to other causes.

[1]El-Sahly, H. M., R. L. Atmar, W. P. Glezen, and S. B. Greenberg. "Spectrum of Clinical Illness in Hospitalized Patients with "Common Cold" Virus Infections." *Clinical Infectious Diseases* (2000): 96-100. Web.

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