INFLUENZA A NOVEL VIRUS INFECTION

REPORTING INFORMATION

- **Class A:** *Report immediately via telephone* the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located. Local health departments should report immediately via telephone the case or suspected case and/or a positive laboratory result to the Ohio Department of Health (ODH).
- Reporting Form(s) and/or Mechanism:
    - *Immediately via telephone.*
    - The local health department should enter the case into the Ohio Disease Reporting System (ODRS) within 24 hours after the telephone report.
- The Human Infection with Novel Influenza A Virus Case Report Form is available for use to assist in local health department case reporting and preliminary disease investigation activities. Information collected from the form should be entered into ODRS and not sent to ODH, unless otherwise requested.

AGENT

Influenza A strains are subclassified by two antigens, hemagglutinin (H) and neuraminidase (N). Novel influenza A virus infections are all human infections with influenza A viruses that are different from currently circulating human influenza H1 and H3 viruses. These viruses include those that are subtyped as non-human in origin and those that are unsubtypable with standard methods and reagents.

CASE DEFINITION (CDC, 2010)

Clinical Presentation

An illness compatible with an influenza virus infection (fever >100 degrees Fahrenheit with cough or sore throat).

Laboratory Criteria for Diagnosis

- A human case of infection with an influenza A virus subtype that is different from currently circulating human influenza H1 and H3 viruses. Novel subtypes will be detected with methods available for detection of currently circulating human influenza viruses at the ODH Laboratory (e.g. real-time reverse transcriptase polymerase chain reaction [RT-PCR]). Confirmation that an influenza A virus represents a novel virus will be performed by the Centers for Disease Control and Prevention's (CDC's) influenza laboratory. Once a novel virus has been identified by CDC, confirmation may be made by the ODH Laboratory and other public health laboratories following CDC-approved protocols for that specific virus, or by laboratories using an FDA-authorized test specific for detection of that novel influenza virus.
- Cases of human infection with unsubtypable influenza A viruses detected by the Ohio Department of Health Laboratory will be managed in accordance with the Ohio Department of Health's Pandemic Influenza Preparedness and Response Plan (PIPRP).

Comment

Novel subtypes include, but are not limited to, H2, H5, H7, and H9 subtypes. Influenza H1 and H3 subtypes originating from a non-human species or from genetic reassortment between animal and human viruses are also novel subtypes.

Non-human influenza viruses include avian subtypes (e.g. H5, H7, or H9 viruses), swine and other mammalian subtypes.

Case Classification

Suspect: A case meeting the clinical criteria, pending laboratory confirmation. Any case of human infection with an influenza A virus that is different from currently circulating human influenza H1 and H3 viruses is classified as a suspected case until the confirmation process is complete.

Probable: A case meeting the clinical criteria and epidemiologically linked to a confirmed case, but for which no confirmatory laboratory testing for novel influenza virus infection has been performed or test results are inconclusive for a novel influenza A virus infection.

Confirmed: A case of human infection with a novel influenza A virus confirmed CDC's influenza laboratory or using methods agreed upon by CDC and CSTE as noted in Laboratory Criteria, above.

Not a Case: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

Comment

Criteria for epidemiologic linkage:

- The case has had contact with one or more persons who either have/had the disease, AND
- transmission of the agent by the usual modes of transmission is plausible

OR

- A case may be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory-confirmed. Laboratory testing for the purposes of case classification should use methods mutually agreed upon by CDC and the Council of State and Territorial Epidemiologists (CSTE). Currently, only viral isolation, RT-PCR, gene sequencing, or a 4-fold rise in strain-specific serum antibody titers are considered confirmatory.

Once a novel virus is identified by CDC, it will be nationally notifiable until the Council of State and Territorial Epidemiologists (CSTE) in consultation with CDC determines that it is no longer necessary to report each case.

SIGNS AND SYMPTOMS

Until the novel influenza virus starts circulating in people, it is unknown the particular symptoms of infection and the severity of the illness. Seasonal influenza infections may be asymptomatic or may produce a wide spectrum of manifestations from mild to severe. Typically, seasonal influenza causes an acute infection of the respiratory tract characterized by fever (101°-102° F, usually with an abrupt onset), chills, headache, myalgia, prostration (extreme exhaustion), coryza, sore throat and cough. GI symptoms (e.g. nausea, vomiting, diarrhea) sometimes occur in children. Most uncomplicated infections subside in 3-7 days. Complications associated with seasonal influenza include febrile convulsions, viral pneumonia, bacterial pneumonia (e.g. pneumococcal, staphylococcal), otitis media, sinusitis, acute myositis and Reye syndrome.

DIAGNOSIS

- Influenza virus isolation in tissue cell culture from respiratory specimens.
- Reverse-transcriptase polymerase chain reaction (RT-PCR) testing of respiratory specimens.
- Immunofluorescent antibody staining (direct or indirect) of respiratory specimens.
- Rapid influenza diagnostic testing of respiratory specimens.

EPIDEMIOLOGY

Source

Humans are the reservoir of human influenza viruses. Different antigenic subtypes occur in other species; mammalian reservoirs (e.g. swine) and avian reservoirs (e.g. ducks) may be the sources of new human subtypes via genetic reassortment.

Occurrence

Influenza occurs in pandemics, epidemics, localized outbreaks and as sporadic cases. Epidemics and pandemics follow the introduction of influenza strains that are different (e.g. novel) from the previously circulating strains. New strains occur when there is a slight variation of an existing strain (i.e. antigenic drift) or the appearance of completely different strain (i.e. antigenic shift).

Attack rates are higher for school age children than for preschoolers or adults.

Mode of Transmission

Direct person-to-person contact through droplet spread or via articles recently contaminated with nasopharyngeal secretions.

Period of Communicability

Most adults may be able to infect others beginning 1 day before symptoms develop and up to 5 days after the onset of illness. Children may be infectious for up to 7 days after onset of symptoms.

Incubation Period

The incubation period is ≤7 days.

PUBLIC HEALTH MANAGEMENT

Case

Investigation

All novel influenza A cases will be investigated in accordance with ODH's Pandemic Influenza Preparedness and Response Plan (PIPRP).

Treatment

All novel influenza A cases will be treated in accordance with ODH's PIPRP.

Isolation and Follow-up Specimens

Isolation and follow-up of all novel influenza A case specimens will be conducted in accordance with the ODH's PIPRP.

Public Health Significance

The detection or confirmation by a state public health laboratory of either an influenza A virus that cannot be subtyped with standard methods (e.g. real-time RT-PCR assays for human influenza A H3 or H1 viruses) or a non-human

influenza virus (e.g. H5) from a human specimen could be the initial identification of a virus with pandemic potential. Prompt notification of CDC by a state epidemiologist in conjunction with the public health laboratory will permit rapid confirmation of results and reporting to the World Health Organization (WHO). Additionally, it will aid prompt viral characterization and the development of virus-specific diagnostic tests.

Contacts
Public health personnel should attempt to identify all known close contacts of suspected novel influenza A cases. Close contacts are defined as persons who were within 6 feet of an ill suspected, probable or confirmed case while the case was symptomatic.

Data gathered from human cases of the H5N1 virus suggest that the incubation period for human infection with a novel influenza A virus is generally ≤7 days. Therefore, all identified close contacts should be monitored daily for 7 days after the last known exposure to a person ill with novel influenza A. The following should be assessed each day during this period:
a) Measured temperature; and
b) Presence of any illness symptoms.

Any close contacts that have a measured temperature of ≥38.0° C (100.4° F) or any illness symptoms should be referred for prompt medical evaluation and possible testing for the novel influenza A virus.

Discontinuing Follow-up of Close Contacts
Monitoring of close contacts of a suspected novel influenza A case may be discontinued when laboratory testing by RT-PCR of appropriately collected respiratory specimens by a state health department laboratory or CDC has excluded infection with virus. Monitoring may also be discontinued in the absence of any illness symptoms among contacts during the 7-day surveillance period described above.

Antiviral Use
Influenza antivirals, such as the neuraminidase inhibitors oseltamivir (Tamiflu®) and zanamivir (Relenza®), are to be used in accordance with the Ohio Department of Health's Pandemic Influenza Preparedness and Response Plan (PIPRP).

Prevention and Control
The best means of preventing the spread of and exposure to a novel influenza A virus is a vaccine that is well-matched to the virus causing illness. However, since the virus is novel a vaccine does not exist and it is not likely that a vaccine will be available until well after the virus emerges. In the absence of a vaccine (and in conjunction with one when it becomes available), community strategies referred to as non-pharmaceutical interventions (NPI) may delay or mitigate the spread of the novel virus.

NPI guidelines (i.e. measures intended to reduce contact between people) issued by the CDC in February 2007 include, but are not limited to, the following:
- Closing schools;
- Canceling public gatherings;
- Voluntary isolation of cases; and

- Voluntary quarantine of household contacts.

Special Information
An outbreak of infections with a novel influenza A virus demonstrating human-to-human transmission could signal the beginning of the next pandemic. Robust epidemiologic and laboratory surveillance systems are required for a coordinated public health response to novel influenza A virus infections. Early detection of an influenza A virus with pandemic potential will permit identification of viral characteristics (e.g. genetic sequence, antiviral susceptibility, and virulence) that will affect clinical management and public health response measures. It should also facilitate development of a virus-specific vaccine and testing strategies.