Novel Coronavirus

During September 2012 through March 2013, the World Health Organization received reports of 17 persons with respiratory symptoms due to a novel coronavirus, 11 resulting in death. This new coronavirus represents an emerging pathogen with the potential to cause severe respiratory illnesses.

Coronavirus Infection

Coronaviruses are a family of RNA viruses associated with respiratory infections. The name for these viruses was derived from their surface projections that create a corona-like effect. Specific coronaviruses infect humans while other strains cause respiratory or gastrointestinal illnesses in animals such as monkeys, palm civets, bats, raccoon dogs, pigs, cows, rodents, cats, and dogs.

Initially there were several human coronaviruses known to cause mild cold-like respiratory infections. In 2003, a new coronavirus was identified as the cause of respiratory infections resulting in severe acute respiratory syndrome (SARS). The SARS-associated coronavirus spread from China to 30 countries, particularly affecting mainland China, Hong Kong, Hanoi, Singapore, and Toronto. Over 8000 SARS cases and over 800 deaths were identified. Person-to-person transmission of SARS was well documented, including within healthcare settings. In one specific situation, a single patient started a chain of superspreading events that resulted in a total of 77 connected SARS cases.
In September, 2012, a novel coronavirus was identified in a Saudi Arabian resident who died of a severe respiratory disease. As of March, 2013, 17 cases with 11 deaths have been identified. Most cases have occurred in Saudi Arabia, Jordan, and Qatar, although several patients were treated in the United Kingdom and Germany after returning from Arabian Peninsula countries.

Secondary transmission of this novel coronavirus was demonstrated in the United Kingdom. An index case had illness onset after travel to Pakistan and Saudi Arabia. Severe respiratory illness then developed in a household member having extended contact with the index case and mild respiratory illness developed in a family member with only 2.5 hours of contact while visiting the index case in a hospital. Evidence from these secondary cases suggests an incubation period of one to 9 days.

Case Reporting

On March 8, 2013, the Centers for Disease Control and Prevention (CDC) issued a health advisory to health care providers with recommendations for evaluating persons with suspected novel coronavirus infection. Novel coronavirus infection should be suspected in persons meeting the following criteria:

- Acute respiratory infection (e.g., fever ≥ 38°C [100.4°F] and cough)
  AND
- Pneumonia or acute respiratory distress syndrome suspected from clinical or radiological evidence
  AND
- Symptoms within 10 days of travel in the Arabian Peninsula or neighboring countries (Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian territories, Qatar, Saudi Arabia, Syria, United Arab Emirates or Yemen)
  AND
- Symptoms not explained by other etiology, including community-acquired pneumonia (i.e., testing ruled out influenza A and B, respiratory syncytial virus, adenovirus, Streptococcus pneumoniae, and Legionella pneumophila; note there are documented co-infections with coronavirus and other respiratory agents such as influenza)
Novel coronavirus infection should also be suspected in persons who:

- Exhibit the above acute respiratory symptoms and had close contact, including through healthcare work, with a traveler symptomatic within 10 days of travel in the Arabian Peninsula or neighboring countries
  OR
- Develop severe acute lower respiratory illness of known etiology not responding to appropriate therapy within 10 days of travel in the Arabian Peninsula or neighboring countries (representing possible co-infection with coronavirus along with a known agent)

Healthcare providers should immediately notify the local health jurisdiction of suspect cases of novel coronavirus infection for reporting to the Washington State Department of Health and CDC. Department of Health can assist local health jurisdictions with recommendations for specimen collection and shipment for coronavirus testing at CDC. As an outbreak progresses, new information may change case definitions and prevention recommendations for this virus.

Conditions caused by these recently identified coronaviruses present many challenges for conducting public health surveillance. Some cases have presented with mild respiratory illnesses which cannot clinically be distinguished from illness due to other respiratory pathogens. Furthermore, some cases may be asymptomatic. In addition, travel to the affected regions may be common, particularly during religious observances such as Ramadan, Passover, and Easter.

**Case Management**

Novel viruses causing respiratory symptoms also present challenges for infection control. Respiratory illnesses are common, particularly mild ones, and have many potential causes. The public health experience with SARS found the risk of transmission in healthcare settings was
most associated with close contact with infected patients, improper training for use of protective infection control procedures, and inconsistent use of personal protective equipment.

Control of SARS-like agents in healthcare settings involves multiple coordinated responses. Patients making an appointment for respiratory symptoms of any severity should be asked about recent international travel. Patients likely to have respiratory infections should wear masks and, if possible, be separated in waiting areas; this will also protect healthcare providers and other patients from communicable respiratory pathogens such as influenza or pertussis. Other measures to control transmission of SARS-like agents in healthcare settings are: hand hygiene for providers and patients; contact precautions; thorough cleaning of rooms occupied by patients with coronavirus infections; and airborne precautions including use of N95 or higher level respirators and eye protection, particularly during aerosol-generating or other high risk healthcare procedure. If N95 masks are not available, healthcare providers should wear snug-fitting surgical masks and eye protection.

Public health and healthcare planning for coronavirus outbreaks will improve response for other communicable disease challenges such as pandemic influenza that can impact healthcare facilities and the general population. Surveillance for cases among patients and healthcare personnel, maintaining sufficient healthcare supplies and staffing, and limiting transmission within healthcare facilities contributed to controlling SARS. CDC has provided guidance for infection control precautions in various settings. Support of disease surveillance will permit early recognition, diagnosis, and infection control for infections with novel coronavirus or other emerging pathogen.

Resources

CDC case definition and guidance: http://www.cdc.gov/coronavirus/ncov/case-def.html#guidance