Saint Luke's Regional Laboratories
Clinical Laboratory Letter

June 2014

MERS CoV Update

Coronaviruses are a large, diverse group of viruses that affect many animal species. A few of these viruses cause a wide range of respiratory illness in humans, typically with common cold symptoms. A novel coronavirus was identified in 2012, which has been named Middle East respiratory syndrome coronavirus (MERS-CoV). Genetic sequence data indicate that this novel coronavirus is a beta-coronavirus similar to bat coronaviruses and unrelated to any other coronavirus described in humans, including the coronavirus that caused severe acute respiratory syndrome (SARS).

The first patient was a 60 year old man from Saudi Arabia, who was hospitalized in June 2012. As of May 2014, 663 laboratory-confirmed cases of MERS-CoV infection have been reported by WHO. Although some individuals experience only mild illness, 62% of cases have developed severe respiratory illness requiring hospitalization. Mortality rate has been 29%. All reported cases have been directly or indirectly linked through travel or residence to seven countries in the Arabian Peninsula including Saudi Arabia, UAE, Qatar, Oman, Jordan, Kuwait, and Yemen. Travel associated MERS cases have been reported in the United Kingdom, France, Tunisia, Italy, Malaysia, Greece, and Egypt.

Recently, CDC reported the first two cases of MERS-CoV occurring in the United States (Morbidity and Mortality Weekly Report (MMWR) May 16, 2014 / 63(19);431-436**)**. The first patient was a health care worker employed in Saudi Arabia who returned to the United States on April 27 and was hospitalized in Indiana. The second case involved a traveler from Saudi Arabia who was hospitalized in Florida on May 11, 2014.

MERS should be considered in patients who meet the following criteria:

- Fever (≥38°C, 100.4°F) and pneumonia or acute respiratory distress syndrome AND EITHER
- History of travel from countries in or near the Arabian Peninsula within 14 days before symptom onset; OR
- Close contact with a symptomatic traveler who developed fever and acute respiratory illness within 14 days after traveling from countries in or near the Arabian Peninsula OR
- Is a member of a cluster of patients with severe acute respiratory illness of unknown etiology in which MERS-CoV is being evaluated

Suspected cases should be reported to CDC (770/488-7100). Laboratory confirmation by MERS-CoV PCR may be performed by CDC or state labs when deemed necessary. CDC recommends collecting multiple specimens from different sites at different times after symptom onset including nasopharyngeal swab, oropharyngeal swab, sputum, serum, and stool/rectal swab. Collection of lower respiratory specimens such as sputum or bronchoalveolar lavage is recommended because MERS-CoV has been detected in these specimens even though nasopharyngeal swabs tested negative. In Missouri, before any specimens are collected for testing, the State Laboratory must be contacted at 800/392-0272. Even though the Saint Luke's respiratory panel contains coronavirus, it does not reliably detect MERS-CoV.

Guidance on evaluation of patients for MERS-CoV infection is available on CDC's MERS website. (http://www.cdc.gov/coronavirus/mers/index.html).

Cryptococcal Antigen

Cryptococcus neoformans is acquired by inhalation and causes pneumonia. It may disseminate from the lungs and invade the CNS causing meningitis. Other viscera, bone, and skin may also be involved. Cryptococcosis can occur as a primary disease or secondary to immunosuppression. Previously, cryptococcal meningitis was diagnosed by staining

CSF with India ink. A more sensitive cryptococcal antigen test has replaced the India ink test and can detect fungus in both serum and CSF.

The cryptococcal antigen test has both diagnostic and prognostic value. Positive specimens are titrated and the highest titers are reported. CSF titers of 1:8 or higher are considered strong evidence of active infection. The antigen titer is proportional to the extent of infection, with increasing titers indicating progressive infection. Response to chemotherapy can be monitored with serial titers. Decreasing titers suggest a favorable response, while unchanging or increasing titers suggest unsuccessful treatment.

Effective immediately, there are two Epic test designations for cryptococcal antigen. Crypto Ag defaults to blood as the specimen type, and Crypto Ag CSF should be ordered for spinal fluid. The specimen requirement is one SST tube of blood or 1 mL of spinal fluid.

Measles Outbreak

Measles is caused by the rubeola virus. Humans are the only natural hosts. Rubeola virus normally grows in the cells lining the back of the throat and lungs. Measles kills an estimated 164,000 people worldwide each year. Large outbreaks are occurring, in Europe, Africa, Asia, and the Philippines. Measles was declared eliminated in the U.S. in 2000 due to high 2-dose measles vaccine coverage, but there is now a resurgence.

According to the Missouri Department of Health and Senior Services, 334 cases of measles have been reported to the CDC between Jan. 1 and May 30, 2014. This is the largest number of U.S. measles cases reported in the first 5 months of a year since 1994. Most cases in the U.S. have involved patients who have been exposed in another country and are unvaccinated.

Measles is highly contagious and is transmitted by contact with an infected person through coughing and sneezing. Patients are considered to be contagious from 4 days before until 4 days after the rash appears. After an infected person leaves a location, the virus remains contagious for up to 2 hours in the air and on surfaces.

Measles is characterized by a prodrome of high fever, cough, coryza, conjunctivitis and Koplik's spots, followed by an erythematous rash. Sometimes immunocompromised patients do not develop a rash. Koplik's spots on the buccal mucosa are considered pathognomonic of measles and may precede onset of rash by several days. The rash usually appears about 14 days after a person is exposed; however, the incubation period ranges from 7 to 21 days. The rash spreads from the head to the trunk to the lower extremities. Approximately 1 in 10 children with measles also develops an ear infection, 1 in 20 pneumonia, 1 in 1000 encephalitis, and 1 in 1000 die. People at high risk for severe illness include infants and children aged <5 years, adults aged >20 years, pregnant women and people who are immunocompromised. Complications include pneumonia, encephalitis, and death.

Measles cases have been confirmed recently in the Kansas City metro area in both states. Suspected measles patients should be isolated & reported immediately to local and/or state public health departments, prior to any laboratory testing. In Missouri, specimens may be submitted for IgM serology and PCR testing after consultation with the State Public Health Laboratory at 573/751-3334. In Kansas, suspected cases should be reported immediately to KDHE at 1-877-427-7317, and testing will be facilitated based on consultation. Additional information, including vaccine recommendations can be found at http://www.cdc.gov/measles/index.html.

Pneumocystis by PCR

Pneumocystis jiroveci, previously known as *P. carinii*, is a causative agent of pneumonia in immunocompromised individuals, especially those infected with HIV. Traditionally, pneumocystis has been detected in respiratory specimens by means of special staining, either by silver stain (GMS) or fluorescent antibody (DFA). The disadvantages of special stains are lack of sensitivity, expertise required for interpretation, and labor intensiveness of the process.

In 2007, Saint Luke's Regional Laboratory began referring pneumocystis testing for PCR due to greatly improved sensitivity over older methodology. Effective immediately, testing is being performed in-house in the Molecular Diagnostics laboratory. Bronchoalveolar lavage fluid (0.5 mL minimum) is the preferred specimen. Induced sputum, bronchial washings, and tracheal aspirates are also acceptable.