Human Metapneumovirus in Nebraska

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Discoveries continue to occur in the world of microbiology. This time, it's a new virus called the human metapneumovirus (hMPV). This virus was first discovered in the Netherland in 2001 from children and adults with acute respiratory infections. Subsequently, hMPV was diagnosed in patients with acute respiratory symptoms in the USA, Canada, Australia, and the United Kingdom. This RNA virus is classified in the *Paramyxoviridae* family, which also contains parainfluenza, mumps and measles viruses.

Human metapneumonvirus has been found worldwide with high prevalence of the viral antibodies in all age groups. The sporadic infection by this virus can occur year-round with a peak incidence during the late winter to early spring, overlapping with that of the respiratory syncytial virus (RSV). The incubation period is 3-5 days and the virus is transmitted by close contact with contaminated secretions such as large-particle aerosols. The rates of hMPV infections are similar in males and females with the peak incidence in children younger than 5 years. The highest risk of the lower respiratory tract infections by hMPV is in the first 6 months of life which suggests that young age is a risk factor for severe disease. The virus causes infections in adults and the elderly but severe diseases is less likely to occur. Human metapneumovirus has been recognized as second most common cause of viral respiratory tract infections in children after RSV and can cause both upper and lower respiratory tract infections such as common cold, bronchiolitis, croup, and pneumonia.

The recommended specimens to detect hMPV include nasal washes, nasopharyngeal swabs, and BAL specimens transported in viral transport media at 4°C. Specimens should by processed immediately in the laboratory or should be stored at -70°C in case of delay.

Since the virus replicates poorly in most conventional cell cultures, an RT-PCR method using hMPV specific primers is the best method for detection. The Clinical Microbiology Laboratory at The Nebraska Medical Center is performing the FDA-approved respiratory viral panel (RVP) test to detect the most common causes of the viral respiratory tract infections including hMPV. After extraction of nucleic acids, RT-PCR is performed to amplify the viral nucleic acids followed by a step to clean the amplicon product. The cleaned product is then re-amplified using labeled nucleotides. The labeled amplicons are subsequently hybridized to beads with Luminex™ technology used for detection. The turnaround time for this test is 24 hours.

A total of 350 specimens (excluding H1N1v) during the 2008-09 viral respiratory season were tested by RVP. Within this series, 10 cases of hMPV were found (6 females and 4 males) as well as 54 rhinovirus, 13 adenovirus, 20 parainfluenza viruses, 26 influenza viruses, and 22 RSV. Of the 10 hMPV cases, 8 were >5 years old. The incidence rate of hMPV was 2.9% compared to 6.3% for RSV.

This data reveals that hMPV is is an important pathogen in our environment. Further analysis regarding hMPV typing and categorization is ongoing and laboratory scientists need to be aware of this virus to properly advise medical practitioners.