

Yet Another Health Challenge?

The recent outbreak of human metapneumovirus (HMPV) in China has sparked growing concerns worldwide due to its potential to spread rapidly and cause severe respiratory illnesses. Many patients presented with symptoms such as high fever, persistent coughing, and difficulty breathing. Initial diagnoses suggested these were cases of influenza or COVID-19. However, subsequent laboratory testing identified HMPV as the primary culprit. There have been media reports of some HMPV cases detected in Karnataka. Two cases were identified through routine surveillance for multiple respiratory viral pathogens, as part of ICMR's ongoing efforts to monitor respiratory illnesses across the country.

While HMPV is not a new virus, its ability to infect large populations, especially vulnerable groups such as young children, the elderly, and those with weakened immune systems, has brought it under the spotlight. It is emphasized that HMPV is already in circulation globally, including in India, and cases of respiratory illnesses associated with HMPV have been reported in various countries. Furthermore, based on current data from ICMR and the Integrated Disease Surveillance Programme (IDSP) network, there has been no unusual surge in Influenza-like illness (ILI) or severe acute respiratory illness (SARI) cases in the country. Now, with new cases emerging in other countries, including India, there is an urgent need to better understand this virus.

Why is This Outbreak Concerning? This is because of—1) Scale of Infection: The outbreak in China has reportedly affected thousands of individuals within a short time frame, making it one of the most significant HMPV surges in recent history. The densely populated urban environment allowed for swift person-to-person transmission, overwhelming healthcare systems in several regions. 2) High Vulnerability in Certain Groups: Children under 5 years of age, elderly individuals, and people with compromised immune systems have been the most affected. Severe cases often required hospitalization, ventilatory support, and extended recovery periods. 3) Potential for Global Spread: With international travel resuming at pre-pandemic levels, the virus has the potential to spread rapidly across borders. Early reports of cases outside China, including India and other neighboring countries, highlight the global implications of this outbreak.

There are some differences between HMPV in India and China. While the initial outbreak in China involved a wide geographic spread, the cases in India are more localized but still concerning because of scale of infection and healthcare response. The outbreak in India is currently less widespread than in China, but it shows the potential for escalation if it is not contained. Public awareness campaigns about HMPV symptoms, prevention, and care are being initiated, although public knowledge of the virus remains limited.

Symptoms commonly associated with HMPV include cough, fever, nasal congestion, and shortness of breath. The estimated incubation period is 3 to 6 days, and the median duration of illness can vary depending upon severity but is similar to other respiratory infections caused by viruses.

The clinical manifestations of an HMPV infection are indistinguishable from those of an RSV infection, especially in young children. Clinical symptoms of HMPV infection may progress to bronchitis or pneumonia and are similar to other viruses that cause upper and lower respiratory infections. HMPV patients are generally diagnosed with bronchiolitis, bronchitis, and pneumonia. They show common symptoms like fever, cough, hypoxia, upper respiratory tract infection, lower respiratory tract infection, and wheezing. However, the most common causes of hospitalization are bronchiolitis and pneumonia. The average duration of fever in HMPV-positive cases is about 10 days, with a peak during the course of the illness. Young adults with HMPV re-infection show mild cold and flu-like symptoms, with fever in a small proportion of infected cases. However, in the case of elderly patients, re-infection can lead to severe symptoms (such as pneumonitis) and even to death. One study reported that 50% of children with HMPV infection were diagnosed with otitis media and another study reported that HMPV infection was found in about 8% of children who came to the hospital with wheezing. Wheezing is a common clinical symptom observed in multiple studies of children with hMPV-associated lower respiratory tract infections. HMPV infections can lead to asthma exacerbations in small children and adults. HMPV acts as an enhancer of COPD and patients with COPD are more prone to hMPV infection. A few reports have also suggested that hMPV infection in children may be associated with a spectrum of central nervous system diseases ranging from febrile seizures to severe encephalitis.

Diagnosing HMPV requires a combination of clinical assessment and laboratory testing. Given its similarity to other respiratory illnesses, specific tests are essential to confirm the presence of the virus. Since HMPV is a recently recognized respiratory virus, healthcare professionals may not routinely consider or test for HMPV. However, healthcare professionals should consider HMPV testing during winter and spring, especially when HMPV is commonly circulating.

Infection with HMPV can usually be confirmed by:

- Direct detection of viral genome by nucleic acid amplification test (NAAT), and
- Direct detection of viral antigens in respiratory secretions using immunofluorescence or enzyme immunoassay.
- Polymerase chain reaction (PCR) tests: The gold standard for detecting HMPV-specific genetic material.
- Serological tests: Identifying antibodies against HMPV in the blood.

For rapid and accurate diagnosis of HMPV infections, a combination of immunofluorescence assays and direct fluorescent antibody methods is used as the first-line of diagnosis, followed by RT-PCR on the negative samples. In the future, the availability of shell vial centrifugation techniques may further enhance the diagnostic capabilities for HMPV.

There is no specific antiviral therapy to treat HMPV and no vaccine to prevent HMPV. Currently, the treatments available for HMPV infection are primarily supportive. But a few reports have raised the possibility of using ribavirin, immunoglobulin, fusion inhibitors, and small interfering ribonucleic acids for the treatment and control of HMPV infection. Several vaccine candidates against HMPV have undergone testing in rodent models and non-human primate models. Although they have shown promising results, none has yet been tested in human volunteers. There may be problems—a heat inactivated viral vaccine against HMPV enhanced lung disease when tested in mice. Human metapneumovirus is a relatively recently described virus and hMPV appear to be as dangerous a pathogen as human respiratory syncytial virus (HRSV) in terms of morbidity and mortality.

As an important respiratory pathogen, understanding HMPV pathogenesis and molecular constraints for severe disease is essential for the treatment of infection and for the development of an effective vaccine against HMPV. The unnecessary panic should be prevented by educating the public. Early and accurate diagnosis is crucial for effective management and to prevent complications. While there is no specific vaccine or antiviral treatment for HMPV, preventive measures play a vital role in reducing the risk of infection.

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