International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 31, Issue 5, May 2025 **ijppr.humanjournals.com** ISSN: 2349-7203

Drug Repurposing and Alternative Therapies for Human Metanuemo Virus (HMPV): A New Hope for Old Problem

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Received: 2025-04-28 Revised: 2025-05-15 Accepted: 2025-05-20

ABSTRACT

Human Metapneumovirus is a relatively newly described virus. It was first isolated in 2001 and currently appears to be one of the most significant and common human viral infection Although human viral was primarily known as causative agents of respiratory tract infections in children. Research providing clinical insight into the epidemiology, spectrum or burden of HMPV is limited but may aid in directing public health interventions in regions most impacted. HMPV are responsible for destructive respiratory infections among children's, elderly and immunocompromised patients that can progress into mild pneumonia since ,there are no specific vaccines or approved antiviral drugs for HMPV yet ,researchers are exploring drug repurposing-using old drugs in New way -as faster and more Cost effective way to find treatments such alternative therapies, including both Morden medicines and natural remedies like, those from Ayurveda to manage and treat HMPV infections. The aim of this paper is to review the current literature concerning HMPV infections.

INTRODUCTION

"The art of virus and bacterial infections such as colds, pharyngitis, laryngitis, bronchitis, pneumonia, bronchitis, and more is very common.(1) The pathogenesis of acute respiratory infections in patients hospitalized in Kuwait is primarily under stress. Furthermore, accurate data on respiratory virus incidence and epidemiological distribution are important for general health and control of disease prevention and traditional discharge limits.(2) This is characterized by high costs, long schedules and high wear rates of alternative approaches, especially in the fight against occurrence and re-export. The reverberation of drugs, an approach to identifying new therapeutic uses for existing drug therapies, has proven to be a promising strategy for accelerating treatment. (3) Human metapnemovirus (HMPV) was first isolated in the Netherlands in 2001 by a child with acute respiratory infections.(4) Clinical diseases caused by HMPV range from upper respiratory tract infections to fatty fat and pleural surgery for pulmonary inflammation - lung inflammation. I recently had an acute respiratory infection in the Netherlands. RS virus.(5) The clinical spectrum of diseases caused by HMPV differs from human Metapnemovirus 2001, which has the same acute atmosphere of infection as HMPV infections with HMPV infections, from upper respiratory tract infections to infant bronchitis and pneumonia. RS virus. The clinical spectrum caused by HMPV varies from bronchitis and pneumonia in infants with HMPV to bronchitis and pneumonia, to important respiratory surgeries in this moderate climate. (13) Many studies have examined the prevalence and clinical characteristics of HMPV in China. The most common disease in people of all ages around the world is acute respiratory infections. This is a major cause of mortality and morbidity worldwide. This virus causes most RTIs. An important part of the infection due to the pathogenesis of the virus may also be attributed to the adult human metapneumovirus. HMPV was first identified in the Netherlands in 2001, but serological studies produced from antibodies against HMPV. (14)

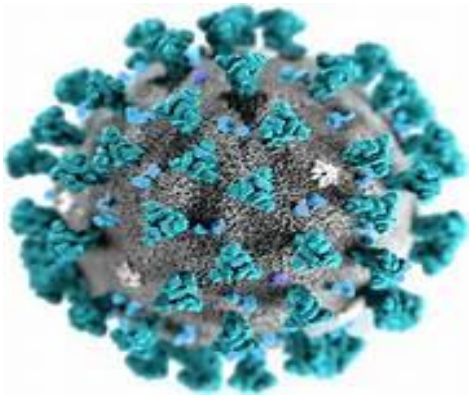

Figure no.1 Human metapneumovirus.

Etiology

Human metapneumovirus is an unadorned, undivided, undivided, unnecessary and versatile RNA virus that was converted to the genre of staining cytopathy and metapneumoviruses in 2016. It spreads to infectious respiratory fluids. Serious infections of HMPV were associated with preterm birth, immune deficiency, and chronic lung, neurological or heart disease. Human metapneumovirus is an important pathogen that causes infections of the upper or lower respiratory tract. (6)

Case Study

Gujarat is seeing two HMPV cases in one day. The number of infections in the state increases to five

A 9 month old child and a 59-year-old man were actively tested for human metapnemovirus (HMPV) in Gujarat, bringing the number of these cases to five. All five HMPV cases were reported in the state within a week. (7)

WHO: HMPV infection in China is not surprising, but after the expected winter trend

The World Health Organization (WHO) has increased respiratory infections such as seasonal influenza, line-virus, and RSV and HMPV cases in China in recent years. The observed increase in recognition of breathing lodges is in the expected region this season. Chinese authorities have confirmed that the health system is not overwhelmed, that hospital use is currently lower than in the previous year, and that emergency situations have not been triggered. According to reports and contributions on social media, hospitals are overwhelmed by infected patients, and crematoriums have difficulty maintaining their pace. Some social media users have proposed that several viruses, including influenza A, HMPV, mycoplasma pneumonia and Covid-19, will circulate in China. There are any emergency claims explained, but there are no official confirmations. HMPV usually leads to flu-like symptoms that affect the exhaled system, but sometimes it can lead to respiratory infections. This virus often occurs in stands in the early morning hours of winter and spring. However, the government has published several guidelines as precautions. Human metapneumovirus (HPMV) is the most common cause of acute respiratory infections. It was identified in 2001 by a Dutch surgeon. It is a seasonal disease that causes respiratory infections and cold diseases. (7)

Maharashtra government guidelines: -

The HMPV virus has not been reported in Maharashtra. However, the government has published several guidelines as precautions. Human metapnemovirus (HPMV) is the most common cause of acute respiratory infections. It was identified in 2001 by a Dutch surgeon. It is a seasonal disease that causes respiratory infections and cold diseases. (8)

Sign & Symptoms

HMPV infections exhibit many symptoms and often observe symptoms of colds, flu, and other respiratory diseases, such as Covid-19. This similarity can make initial diagnosis difficult without specific tests. The most common symptoms are coughing, fever, nose flexion, sore throat and lack of breathing. These symptoms are mild and will dissolve within 1-2 weeks. In severe cases, HMPV can lead to more severe complications, particularly in populations of endangered species.

Diagnosis

The symptoms of clinical symptoms are similar to those of other respiratory viruses, and may be similar as follows: Accurate diagnosis.

Diagnosis method

a**. RT-PCR (reverse transcription polymerase chain reaction):**

1. Gold standard for recognizing HMPV.

2. Recognize viral RNA in respiratory samples (e.g. nasopharyngeal swabs, aspiration, etc.).

3. High sensitivity and specificity.

b. Antigen recognition:

1. It is less sensitive than RT-PCR, so it is not used very often.

2. This is useful especially in clinical settings where molecular testing is not accessible, when rapid diagnosis occurs.

c. Virus Culture:

1. It is not used on a daily basis as it slowly nurtures the growth and difficulties to nurture HMPV.

2. Special laboratory conditions are required.

d. Serology:

1. It is useful in epidemiological research.

2. Recognizes IgM and IgG antibodies.

3. It is ideal for acute diagnosis due to the need for pairs and recovery periods.

3. Example collection:

1. Nasopharyngeal swabs or aspirators are the preferred specimens.

2. The right timing (within the first few days of illness) increases diagnostic yield. (9, 10)

Treatment

Pharmacological

Pharmacological treatment of human metapnemovirus infections

There is no antiviral therapy specifically approved by the FDA for HMPV. Current pharmacological treatments are supported, with several antiviral active ingredients being tested experimentally.

1. Symptomatic and Supporting Pharmacological Therapy A. Antipyretic and Analgesic Drugs: Acetamol, ibuprofen-Machine: Prostaglandin-Nodular-Nodularity inhibits through the proposal of inhibition of cyclooxygenase (COX): Fever, Myalgia

Mg/kg. (Up to 2400 mg/day in adults) Every 6 hours B. Bronchodilation Irony: Albuterol (salbutamol) Mechanism: Patients with asthma/reactive respiratory disease). Corticosteroids

Drugs: prednisolone, dexamethasone

Mechanism: inflammatory cytokine production, reduced respiratory tract Indications: controversial; respiratory inflammation or underlying

2. Antiviral therapy for research may benefit you: -

A. Ribavirin (Broad Antiviral)

Mechanism: Guanosine analogues that inhibit viral RNA-dependent RNA polymerases and expand viral replication. Unlabeled in patients with severe or immunological diseases

Status: Not routinely recommended due to limited clinical efficacy

B. Monoclonal antibody (under development)

Goal: HMPV fusion (F) protein

Mechanism: Neutralizing the virus, preventing cell development

Reason: HMPV is of viral origin. It will be inspected, but it is not the standard yet. (9, 10, 11)

Non-Pharmacological

Ayurveda means naturally alleviating HMPV-like symptoms to alleviate ginger tea and reduce mucus production.

1. Licoriceroot (Mulethi): -

Multithi is an excellent herb for throat irritation and reducing cough magic. So if you have experienced itching or pain in the throat, this is a considerable option. Use: Bring 1 teaspoon of the selected herb to a boil in 1 glass of water for 5-10 minutes. It's warm and drinks 2-3 times a day.

2. NASYA Therapy (Nose Oil Application): -

NASYA Therapy involves the use of herbal oils in the nasal passages. This eliminates overload and improvements in respiratory function and improvement. So this is included in two simple steps. Vapor intake with essential oils.

In the case of 19 days of COVID, vapor intake has been found to help loosen mucus and relieve nose plugs. To remove the passageway, add eucalyptus oil or camp brain to the hot water and breathe in steam for 5-10 minutes. Experts suggest covering your head with a towel to maximize effectiveness.

3. ChyawanPrash:-

Chyawanprash is a traditional Ayurvedic jam made from Amla (Indian gooseberry) and other herbs. This is a power package of vitamin C and antioxidants that strengthen immunity and improve lung function. Dr. Anand suggested drinking one teaspoon every day in the morning.

Symptomatic Treatment:-

Human metapneumovirus (HMPV) usually causes light to moderate respiratory disease, but can be serious in infants, elderly people, or immune people. Without specific antiviral therapy, management is supportive and symptom-based. To prevent dehydration.

Conclusion

Human Metapneumovirus (HMPV) is a major contributor to acute respiratory infections, particularly impacting young children, the elderly, and immunocompromised individuals. Despite being identified over two decades ago, no specific antiviral therapy or licensed vaccine is currently available for HMPV, highlighting an urgent need for alternative treatment approaches Drug repurposing emerges as a promising strategy, leveraging known safety profiles of existing drugs to accelerate therapeutic development

Furthermore, non-pharmacological interventions such as Ayurvedic remedies—including Tulsi, ginger, and Nasya therapy—may offer supportive benefits that align with symptom relief and immune enhancement Investigational agents like ribavirin and monoclonal antibodies show potential but require more clinical validation before routine use Ultimately, a multidisciplinary approach combining modern pharmacological research, traditional medicine, and robust public health measures may provide an effective strategy to manage HMPV and reduce its global burden. Continued surveillance, dedicated funding, and international cooperation are essential to translate these avenues into actionable public health solutions.

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How to cite this article:
Mr. Valmik D. Bhoi et al. Ijppr.Human, 2025; Vol. 31 (5): 337-342.

Conflict of Interest Statement: All authors have nothing else to disclose.

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