Original Research Paper

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PAPER ON HUMAN METAPNEUMOVIRUS

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ABSTRACT Human Metapneumovirus that causes upper and lower respiratory tract infections.

KEYWORDS : HMPV, Lower respiratory tract respiratory tract infection. Asthma infection Upper

INTRODUCTION:-

Human Metapneumovirus (HMPV) is a common cause of respiratory infection in children, adults , elderly and Immuno compromised patients in 2016.Its classification from tha para myxoviridae family to the pneumoviridae family. Genetic groups of virus are A and B that are each divided into Subclasses consisting of A1,A2,B1,B2, with year to year variability.

This virus Human Metapneumovirus was initially discovered in 2001 in the Netherlands but has been found across the globe. Infection with HMPV usually occurs by the age of 5 years with reinfection that can occur through out the life. It is spread predominantly by respiratory droplets from those who have infected with the virus.

This virus can cause upper and lower respiratory tract infections.

Lower respiratory tract infection due to Human Metapneumovirus causes Pneumonia Bronchiolithics and acute asthma exacerabations.
The pillar of treatment is supporting care, antipyretic drugs, supplemental Oxygen and Intravenous fluids for hydration if needed(1,2,3,4).

Pathophysiology:-

Human Metapneumovirus is spread from person to person through respiratory droplets.

INCUBATION:-

period between 3 to 5 days and varies between individuals. After inoculation with the nasopharyngeal mucosa.the virus can quickly spread into the respiratory tract. This virus approximately contains eight genes that can code for nine different proteins responsible for infecting host cells.

With the attachment of glyco proteins (G) the fusion glyco protein (F) is responsible for Transmembrane fusion by binding itself to intergrim of host cell surface in order to facilitate entry into host cell. Subsequently the nucleus capsid enters the host cells Cytoplasm and undergoes replication. HMPV induced the response of various Chemoikines and Cytokines such as1L-6,1F-N,alpha, TNF- alpha1L-2 and macrophage inflammatory proteins leading to peribronchic bar and perivascular infiltration and inflammation. The inflammatory process also results in monocyte and lymphocyte influx within the airway endothelium,these responses combined lead to pulmonary inflammation causing the respiratory manifestation of cough and mucous production fever dyspnea(1,3,5).

History And Clinical Features:-

Human Pneumonia Virus (HMPV) can present as either upper respiratory tract and or lower respiratory tract infection.

Symptoms Of Upper Respiratory infection includes sore throat, cough, congestion, and ehinorrhoea

Symptoms Of Lower Respiratory tract infections include cough, dyspnea, hypoxia, fever, wheezing.

In children if they having lower respiratory tract infections it can cause Bronchiolithics, cough, acute asthma exacerabations and Pneumonia. This may require hospital admission depending on the severity of symptoms.

Symptoms In Indults :-

HMPV can cause Pneumonia l, acute asthma, exacerabations and acute exacerabations in chronic obstructive pulmonary diseases.

Gastrointestinal Symptoms:-

such as nausea, vomiting and diarrhoea have also been seen.

Abnormal tympanic membrane suggestion of acute olitis media canalso occur. These symptoms can be quite severe in adults and comorbidities with comor,age greater than 65 years old and Immuno compromised patients, including those with HIV, cancer, inminomodultary therepy and transplant recipients 1,3,5,7,8,9).

EPIDEMIOLOGY:-

HMPV is more commonly found in the pediatric population predominantly in children less than 2 years of age, with an average age of 22months. Approximately 90 to 100% of children are infected by HMPV by the age of 5 to 10 years old according to sero prevalence studies, about 5 to 10% of pediatric hospitalizations are a result of HMPV causing acute lower respiratory tract infections. On average children who are less than 6 months of age with HMPV infection were three times as likely to be hospitalized as compared to children between the ages of 6 months to 5 years and treatment of HMPV Blood tests and radiological imaging.

DIAGNOSIS:-

Most common confirmation of infection by HMPV is done by reverse transcription-Polymerase chain reaction (RT-PCR) from Naso Pharynx Swab.

Radiography finding on a chest x-ray are typically non specific unless HM leads to the development of bronchiolitis or pneumonia findings include infiltrates, per branchial cuffing, diffuse perihelia infiltrates, and hyper stimulation, it is crucial to assess vital signs and to perform although physical examinations to being for signs of respiratory distress and hydration status in order to determine which supportive care measures are necessary 1,7,9.

Treatment/Management:-

Primary treatment are supportive measures, Anti pyretic medications such as acetaminophen and ibuprofen are given for those patients with fevers.

If the patients appears dehydrated and cannot tolerate oral hydration, intravenous fluid hydration is indicated. Additionally, patient with HMPV may requires supplemental Oxygen support such as high flow nasal cannula or even mechanical ventilation in severe cases causing acute respiratory failure, especially in those patients who have pre casting respiratory or cardiac illness as well as thos who are immunocompromised.

Most patients do undergo full fill recover, there is no current vaccine available for HMPV so every patient with HMPV should be placed on droplet precaution to limit and prevent spread.

There have been various vaccines against different sturctures of HMPV that have been test on non human primates and rodents that appear promising however none have tested on Human Volunteers 1,3,8,10.

Prognosis:-

Human Metapneumo virus carries a good prognosis. It does require

the clinician to be altinued to a patients. Undergoing medical conditions as well as signs to determine the severity of infection including dyspnea hypoxia and the use of accessory muscles. Typically supportive care measures are sufficient and patient undergo full recovery. Reinfection can occur demonstrating short lined and incomplete Immunity of HMPV 1,3,9.

Unani Remedies for Respiratory Health

1. **Immunomodulatory Herbs**:
   - **Kalonji (Nigella sativa)**: Known to boost immunity and alleviate respiratory symptoms.
   - **Tulsi (Ocimum sanctum)**: Helps with cough, congestion, and inflammation.
   - **Glycyrrhiza glabra (Licorice root)**: Acts as a demulcent and expectorant.
2. **Dietary Recommendations**:
   - Increase consumption of warm, easily digestible foods like soups and broths.
   - Avoid cold and heavy foods that may aggravate phlegm production.
3. **Honey-Based Remedies**:
   - Mix honey with a pinch of cinnamon or ginger powder to soothe cough and improve respiratory function.
4. **Steam Inhalation**:
   - Add a few drops of eucalyptus or mint oil to hot water and inhale the steam to relieve nasal congestion.
5. **Unani Formulations**:
   - **Joshanda**: A traditional herbal tea made from a blend of herbs like licorice, vasaka, and peppermint, used for respiratory health.
   - **Sharbat Toot Siyah**: A syrup made from black mulberry for soothing throat irritation.
6. **Lifestyle Adjustments**:
   - Stay warm and avoid exposure to cold air or pollutants.
   - Maintain hydration with warm herbal teas and water.

Differential Diagnosis:-

For symptoms resembling HMPV Infection includes non infectious causes such as acute asthma and acute chronic obstruent Pulmonary infections causing pneumonia can demonstrate a similar clinical picture other viruses must also be considered, including coronaviruses, rhinoviruses, adenovirus, parainfluenza virus, respiratory syncytial virus and influenza A and b 3,9.

Complications:-

HMPV can cause severe illness, hospitalization in certain patient population, this illness requiring hospitalization among those patients who are immunocompromised or have pre-existing cardiac or respiratory conditions. These patients are more susceptible to developing acute respiratory failure requiring high flow oxygen support with some patients even deteriorating enough to require mechanical ventilation. In these cases, patients need to be advised to the Intinism care unit for close monitoring.

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