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RESPIRATORY VIRAL INFECTIONS AND OUTBREAKS

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ABSTRACT

Viral respiratory infectious diseases are common which include cold, flu, sore throat. A viral infection that obstructs the lungs and airways is known as respiratory viral infections. This viral respiratory infection affects individuals of every age group. Symptoms of viral respiratory infection commonly cause coughs, sneezing, runny nose, sore throats, headache, and fever. A viral respiratory infection can be a serious illness for some people which is at more risk in babies, young children, and people with poor immune systems. IgA is an antibody that plays a very crucial role in the Immune function of the mucous membranes and this antibody has greater protection when compared to all other types of antibodies combined. Viral respiratory infection is spread by contact from one to another or from the surroundings. Now, the newly emerged COVID -19 has become a pandemic respiratory viral infection leading to a life-threatening condition . Mortality rate has increased because of the rapid spreading tendency of the virus among the people in the society. No specific treatments are available as of now. However, self-quarantine can stop or control community spread and improving immunity can defend from the virus attack. The most important step that should be followed to keep the virus at bay is washing hands with soap or handwashes or using sanitizers and using protective masks. The affected persons are given with supportive measures and treatment with some of the antimalarial and antiviral drugs. In this article, viral respiratory infection is reviewed with its symptoms, affecting rate, the transmission and severity of this infection, the spread of this virus, the precautions that should be taken, and the preventive measures for controlling this virus spread.

INTRODUCTION

Respiratory tract infections (RTI) are caused by bacteria, virus and fungal species. Even from childhood RTI may occur. Most of the infections are asymptomatic in young children and old age groups. Bacterial infections are more common in young age and will be asymptomatic in an adult. Viral infections are found in all age groups irrespective of the immune status. Infections in the respiratory tract are classified as upper respiratory tract infections and the lower respiratory tract infections (LRI). LRI is common in young age and very rare in adults unless there is a predisposing factor. Upper respiratory tract infections are caused by a variety of viruses, such as rhinovirus, influenza A and B, parainfluenza, adenovirus, coronavirus and mostly children are affected. Lower respiratory tract infections primarily occur as a result of viruses, as with flu or the respiratory syncytial virus (RSV) and are seen in people over the age 65 year and children below the age of 2 years are affected. An infection that interferes with normal breathing known as a respiratory infection. The viral infection is when it is caused by a virus (1). Respiratory infections such as cold flu and bronchitis affect the lungs and breathing passage (2). Viral respiratory infection is common among all other infections. The viral respiratory infection affects (3) all individuals of every age group and is also associated with epidemics and pandemics. As the climate changes, especially during every winter, outbreaks of respiratory viruses affect many individuals. Infection has common symptoms and runny nose sore throat and fever cough and sneezing. Viral respiratory infection gets severe in one, when it is not diagnosed properly and people with poor immunity such as young children, infants (4, 5) are mostly affected.

In this article, viral respiratory infection is reviewed with its symptoms, the mode of transmission (6). As a new viral infection has emerged all over the countries crossing borders known as coronavirus COVID - 19 (7), without any specific treatment (8), but self-quarantine and imposing good immune (9) is the only way to stop this spread and affect from this virus. Is it important for all disinfectants designed to reduce the effects, having the efficacy to demonstrate the ability to kill bacteria or fungi and evaluating the efficacy of products used in virulence (10) as genes playing a major role in organisms and related species. These virus genomes evolve by recombination technique which helps to evade host immune defense, by changing surface protein antigenicity and viruses replicate through DNA, and mutations occur slowly.

Viruses that can cause these viral respiratory infections are respiratory syncytial viruses (RSV), parainfluenza virus influenza viruses, adenovirus, and also rhinovirus. Mucosal immunology comprises the study of Immune system responses that occur at the mucosal membrane of the intestine, respiratory system (11), and URI (12) genital tract as these surfaces are always in contact with the external environment. The resistance of organisms varies accordingly. (13) For example, *C. albicans* shows resistance to the drugs, by providing genetic alterations by causing mutations (14) which will mediate multidrug resistance in *C. albicans*. Mounting evidence is available towards the

emergence of MDR, XDR and pan-DR *A. baumannii* (15) strains globally and also in India.

In association with this, IgA is an antibody that plays a very crucial role in the immune function of the mucous membranes and has a greater protection when compared to all other types of antibodies combined. This IgA as the first-line defense in the resistance against infections by invading the bacteria and virus location cells are moreover by neutralization of the toxins and viruses both internal and extracellularly. The most important case of increase in the mortality rate with this virus is due to the secondary infection, which occurs during or after the primary treatment.

Mostly, dentists among all the health workers are more prone to get infections easily as dentists are in close contact with oral cavities. Hence, vaccinations should be taken especially for hepatitis - B virus. (16) Infections can easily transmit through oral fluids and dentist in contact with oral cavity while treating patients during any kind of extraction of tooth are easily affected. Dental caries is an important infection to be noted and treated soon before causing any secondary infections. Antibacterial activity of orange peel helps in reducing the extent of dental caries. (17) The most common examples of secondary infections are after taking antibiotics to treat an infection caused by bacteria or fungal or viral.

Most molecular characterization (18) is done to know the molecular level without any effect of the environment of that specific organism. Where DNA based markers known as molecular markers are used in molecular characterization. Diagnostic methods such as serology and tissue culture methods which were old are now being replaced with more advanced molecular techniques, which include PCR, nucleic acid sequence-based amplification, reverse transcriptase PCR, and also loop-mediated acid sequence isothermal amplification is used. In viral respiratory infections the common symptoms are sneezing, coughing, runny nose, sore throat, fever, troubled breathing (19,20), and other symptoms, such as muscle pain, (19) headache, tiredness (21) and fatigue. The specific virus will normally appear after a few days of infection only (22). Virus with symptoms lasts up to 10-11 days, only depending on the type of the virus which has caused this illness to the body. Virus starts showing up only after the 8th day as, till then it is confused between a common cold or flu and or / coronavirus (23)

EPIDEMIOLOGY

Viral epidemiology is a scientific discipline which is concerned with the study of incidence and especially the spread of viruses in populations over a time. Viral infections for determining its dynamics, it includes host, virus and the environmental factors are monitored. Epidemiology characterizes the disease states in human populations and zoonotic, epizootic and enzootic are their equivalents among the animal population also. Viral respiratory infections affect any individual of all age groups (23,24). Viral respiratory infections mostly affect the babies and the toddler, as they tend to keep all the things in their mouth without knowledge (25) Viral respiratory infection affects mostly the upper respiratory tract of an individual. Gargling with water

or mouth washes (26) such as chlorhexidine or herbal mouthwashes may help (27) to prevent upper respiratory tract infections among healthy people.

Though viral respiratory infection can be a serious illness for some people, in most people, it is not a serious illness. (28) People might develop more serious complications such as pneumonia and get severe symptoms more than a healthy person. (28,29) A weaker immune system is one of the main reasons especially in people with hypertension (30) and other health problems are at higher risk. (30) *Acinetobacter baumannii* (31) is one bacteria that can be an opportunistic pathogen affecting people with weak immune systems and is the most difficult antimicrobial-resistant pathogen to control and treat which is isolated from urine samples. (32)

PRIMARY AND RELAPSE OF INFECTION

Viral respiratory infections are more common among individuals, as they spread faster and more easily than any other infections. (33) Viral respiratory infection spread by contact from one to another person or by the surrounding. Unwashed hands of an infected person with viruses, or mucus from the mouth or nose of a person who has already been infected with this virus can be a reason for spread to other people in the community. Respiratory viral infection is transmitted through the droplets of infected persons to another individual. (34)

Virus can spread from the surroundings or from infected people to a healthy person and mostly the recovered person or person showed false negatives. It should always be remembered that just because someone has recovered from a virus does not mean that the individual cannot catch the virus again. Cross infection occurs in an individual with a weak immune system. There is a likelihood of Relapse of infection giving immunity to reinfection.

Relapse of viral infection differs according to the virus caused by the specific disease. Dengue, Ebola virus, hepatitis -A, coronavirus are few examples for relapse of infection. Ebola virus persists in various body fluids, that results in the reactivation of illness. Relapse of infection with ebola virus may be possible due to lowered immunity or at times with high viral challenge. Relapsing of hepatitis -A is an uncommon sequela of acute infection, which is more common in elderly person and is characterised by a protracted course of symptoms of the disease and relapse of infection. Current reviews have stressed to know about coronavirus immunity and relapse of infection or contracting the virus more than once to cured individuals. Many articles have reviewed that relapses of infection or recurrence of symptoms of a disease after a period of improvement occur in many diseases

PREVENTION AND TREATMENT

There are a number of measures to be taken to prevent the spread of viruses and bacteria. Vaccination is one of the best ways to protect ourselves and others from the viral infection. Vaccines vary in their effectiveness and in number of doses required to confer protection and some vaccines require booster shot to maintain the immunity levels. Following hygienic measures which includes, coughing and sneezing without contaminating, avoid touching

nose, eye and mouth with unwashed hands, avoid contact with people who are sick and keeping the surrounding clean and hygiene. Many viral infections resolve on their own without treatment and medications but certain viruses need a proper treatment to get cured. Antiviral medicines are taken to treat some viral infections.

As the pandemic COVID 19 is spreading up its spread across the world it is more important to prevent the spread of the virus before it reaches “as always said prevention is better than cure. As known WHO public health groups and all other NGOs are monitoring this pandemic disease with a serious note. The government has passed lockdown all over the country for his trip reducing this life attending disease and the fast spreading of this virus. (35) Steps like virus testing and “treating patients”, “carrying out contact tracing”, “limiting travels”, “quarantining citizens” and “canceling all the large social gatherings like sports meeting concert schools colleges and all the public gathering “, to keep viruses at bay.

To prevent any virus spread the steps to be followed strictly (36) Washing hands with soap hand wash oftenly, Social distancing from anyone especially who is sneezing and coughing, Covering the mouth and nose while sneezing and coughing with elbow bent or a or tissue is mandatory, Don't touch nose eyes or any part of the face before washing hands. (37)

Mostly avoiding frequent visits to hospitals should be avoided by loving the healthcare system to operate more effectively therefore protecting (38) ourselves. It's very important to make sure they do not get dehydrated and that is why in hospitals IV is given to the patient. Advisory on the use of hydroxychloroquine as Prophylaxis for SARS infection are given. And mostly antibiotics are not prescribed by the doctors as these infections are caused by viruses and not by bacteria. (39)

CONCLUSION

This review article is about respiratory viral infections and is seen in all age groups. It is almost impossible to avoid viral and bacterial infection, and they spread easily. Certain risk factors increase the chance of developing acute respiratory infection. As the immune systems of children and old are poor, they are more prone to be affected by these viruses. These infections affect people with immune systems. Smokers are also at a higher risk and recovery is difficult unless with good immunity. Maintaining good hygiene and following preventive steps can only stop virus spread.

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