



AN OVERVIEW OF PREVENTION MEASURES TOWARDS RESPIRATORY VIRUSES AFFECTING PUBLIC HEALTH

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Abstract:

The spread of many different respiratory infectious viruses in recent years, had impact the public health setting worldwide, where the prevention measures must take place to reduce this impact.

This rapid review aimed to emphasize the important prevention methods toward these infectious diseases that could lead to sever compromise of health care system. The search was performed through multiple electronic searches for strong evidenced based guidelines and studies that discusses the concerned topic. This review conclude that the prevention strategies start at the healthcare setting between healthcare providers, and patients then to educate the population about the precautions and its types.

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DOI: 10.53555/ecb/2022.11.11.144

Introduction:

There have been significant worries voiced about the state of public health all over the world as a result of the widespread spread of acute respiratory infections, in particular the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The World Health Organization (WHO) declared a state of international emergency and the beginning of the SARS-CoV-2 pandemic in the year 2020 [1]. This decision was made in response to the growing number of infection rates that were caused by SARS-CoV infection. Ever since then, authorities in charge of world health have stepped up their efforts to lessen the spread of viral illnesses and lessen the mounting burden that the SARS-CoV-2 epidemic has brought about. There has been an upsurge in the influence that these concerns have had on the public health sectors in recent times [1]. The respiratory syncytial virus, often known as RSV, is a seasonal respiratory virus that, despite the fact that it can cause infection at any point in one's life, is the most common cause of lower respiratory tract infections (RTIs) among patients who are children [2]. Prior to the COVID-19 pandemic, RSV was known to cause epidemics every winter in nations located in the Northern Hemisphere. These epidemics were characterized by the presence of bronchiolitis, which is an inflammatory illness that affects the tiny airways, as well as croup, pneumonia, and regular colds [3]. Due to the fact that SARS-CoV-2 is a highly contagious infection, it is necessary to implement stringent

prevention and control measures. The prevention and treatment of respiratory infections involves the use of both medications, such as immunizations, and nonpharmaceutical interventions (NPIs), which include social distancing, hand hygiene, and the wearing of masks [4].

The aim of this narrative review was to address the measures that could prevent the spread of respiratory infectious viruses, which may lead to huge obstacles to the public health.

Review

The respiratory syncytial virus, often known as RSV, is widely acknowledged as the primary reason for the utilization of healthcare resources in the field of paediatrics. This includes hospitalizations and admissions to critical care units. As a result of their high rate of transmission, infectious respiratory disorders provide a threat not only to healthcare professionals but also to their patients, as well as to their friends and family.

Employees in the healthcare business thought that the degree of support they received from their management team had an influence on how they responded to the procedures that were specified in healthcare recommendations. This sentiment was shared by employees in the healthcare industry. The degree of involvement that healthcare workers had with infection prevention and control (IPC) guidelines increased when they had the perception that hospital administration and management were offering supportive behaviors [5]. This happened when they had the sense that these behaviors were being provided.

Participants in one research [5] suggested that managers should build a safety culture by modeling proper infection control procedures for all staff members. This would be done in order to ensure that all employees are safe. Furthermore, this would be in addition to the provision of help with regard to the observance of standard operating procedures. Some of the nurses believed that the support they received from their organization during the SARS crisis (for example, the Director of Nursing purchased food for them, ointment was provided for the discomfort caused by facemasks, and they received phone calls from the hospital's psychiatrists regarding their well-being) bolstered their confidence to take action in response to the situation [6]. Workers in the healthcare industry were able to evaluate the amount of commitment that hospital administration had to maintaining a safe workplace as a result of the actions that hospital management took during a crisis. The investigators state that healthcare workers who perceive themselves as undervalued or insignificant to the institution's mission may experience psychological effects that impact their ability to fulfill their daily clinical duties and reflect on their chosen profession, including their motivation to follow infection control measures. "This is due to the fact that experiencing a lack of support during this specific period has been demonstrated to influence the motivation to comply with infection control measures." [7]. In order to reduce the risk of contracting coronavirus disease 2019 (COVID-19), which is an illness that is caused by an infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), public health professionals and policymakers recommend taking preventative measures, such as the utilization of respiratory protective devices. This is done in order to lessen the likelihood of contracting the illness. However, there is evidence that shows that infection may also be transferred by

very small respiratory aerosols [8]. Although it is commonly assumed that the SARS-CoV-2 virus is spread mostly through contact and large respiratory droplets, there is also evidence that suggests that infection. There are a variety of various types of respiratory protection equipment that are available on the market. These masks, which are commonly referred to as "face masks," are available. Disposable respirators that are comparable to the N95 respirator have been assessed for their ability to effectively filter tiny airborne particles, such as aerosols. These respirators are fitted with protective equipment. For the sake of this discussion, we will refer to surgical masks as "surgical masks." These masks are designed to be loose-fitting, to form a physical barrier, to prevent bigger particles, and to be resistant to fluids. Face coverings that are not used for medical purposes are known as cloth masks. Cloth masks can have varying degrees of filtration and fluid resistance depending on the material that is used, the amount of layers that are utilized, and how well they fit an individual. In comparison to the respiratory protection provided by surgical masks, the respiratory protection provided by single-use N95 respirators and respirators that are equivalent is superior; yet, there have been instances of specific shortages [9]. It has been determined that N95 respirators may be reused and used for extended periods of time in laboratory settings; however, the effectiveness and safety of these respirators in clinical settings are not yet understood [9].

In one study there was no significant difference in the risk of noncoronavirus respiratory illness between surgical masks and N95 or equivalent respirators in community settings, according to the findings of one randomised controlled trial [10].

Currently, the only preventative drugs that have been licensed for RSV-associated respiratory tract infections (RTI) in the United Kingdom are monoclonal antibodies (mAbs), which are also frequently referred to as a "passive vaccine." However, this is not the case in other countries. Palivizumab and nirsevimab are the two that are now available for use. By binding to and rendering inactive the fusion glycoprotein that is located on the surface of RSV, palivizumab is a monoclonal antibody that prevents the virus from entering cells. Palivizumab has been proved to be cost-effective in certain categories, and a recent meta-analysis indicated that it lowers the risk of hospitalization due to RSV infection (risk ratio 0.44, 95% confidence interval [CI]: 0.30 to 0.64). Children who are regarded to be at a high risk of

serious disease, such as children who were born with congenital cardiac disease, are the only ones who are eligible to get it in the United Kingdom [11].

Recent research has shown that there is a significant reduction in the number of RSV infections that are treated by medical professionals, with a relative risk reduction of 79.5% (95% confidence interval: 65.9 to 87.7) [12,13]. However, given the reduction in dose requirements, it is believed that nirsevimab may prove to be a more attractive choice for wide-scale clinical use than palivizumab [12]. Additional large-scale studies on the use of nirsevimab are now being conducted, and the United Kingdom has not yet issued guidance on its use. Over the course of several decades, the creation of a unique RSV vaccination has been a goal of public health. At the present time, there is a multitude of prospective candidates in the process of development, each of which possesses a different mechanism of action [14]. There are just four candidates for pediatric vaccinations that have reached phase II trials at the time this article was written, and none of them are now in phase III development. In a similar vein, a maternal vaccine that confers immunity in early infancy through the transfer of antibodies through the placenta could be a potential preventative approach in the future, assuming that it is cost-effective [14].

Conclusion:

The best measures are observed in the health care settings are to follow the guidelines of prevention methods against infectious viruses, and as well follow the hospital policy that is supported by infectious disease team. When it comes to the prevention of respiratory infections, the evidence about the effectiveness of masks is stronger in health care settings than it is in community settings. In health care settings, the use of N95 respirators may minimize the risk of SARS-CoV-1 in comparison to the use of surgical masks; however, the application of these respirators to SARS-CoV-2 is unknown.

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