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Detailed Review of Challenges Faced in Managing Asymptomatic Carriers and their Contribution in Transmission

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ABSTRACT

Background: Corona virus 2019 is a new human respiratory disease caused by the SARS-CoV-2 virus. Carriers of the virus that do not have symptoms do not show clinical signs but are known to be contagious. A small number of asymptomatic individuals often avoid detection by public health monitoring programs. Unmarked carriers are a silent threat to communities because these people may not follow risk reduction strategies (e.g. wearing a face mask). The rapid spread of COVID-19, strongly influenced by asymptomatic hostility, forced governments around the world to establish and enforce shut off policies aimed at reducing transmission. This manuscript therefore aims to highlight the challenges faced by managing asymptomatic COVID-19 carriers by health professionals and the establishment of the fact that patient without any display of symptoms implement a major role in the distribution of COVID worldwide.

Summary: While it was believed that people with symptoms were able to transmit the disease, the study believed that carriers without symptoms had an equal amount of risk in their transmission. The silent threat posed by asymptomatic and unregistered carriers makes the COVID-19 epidemic extremely difficult to control by health professionals. Severe pneumonia, cardiac arrhythmias are some of the problems seen in symptomatic patients due to diagnostic delays and difficult to control.

Conclusion: So according to the literature asymptomatic carriers are dangerous to people and to their health. A major problem with early detection of invisible cases has been reduced to a major challenge for health professionals. Asymptomatic carriers also have the same amount of threat of transmission as carriers with symptoms.

Key words: Asymptomatic carriers, COVID-19, Complication, Respiratory complication, Cardiovascular complications, Transmission modes

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INTRODUCTION

In December of 2019, unknown cases of atypical pneumonia outbreak were discovered in Wuhan, China. Causative factor of this was later identified as a Corona virus called 'Severe Acute Respiratory Syndrome Corona Virus-2' (SARS-CoV-2), which is phylogenitically but different from other Corona viruses known to cause infections in humans. Corona virus infection was first reported in December 2019. The daily up liftment in the amount of cases quickly characterised the disease as an outbreak and by the end of January 2020 the World Health Organization (WHO) declared this infection as a public health emergency situation. Despite efforts to isolate them, due to high levels of infection, an epidemic was finally declared. As of April 28, 2020, more than 200 countries have been infected with COVID-19 with more than three million confirmed cases leading to the deaths of more than 200,000 people. Corona virus is a covered RNA virus with a unique replication strategy. The virus uses a genetic mutation in an over spiked protein to invade the human body and reproduce. Information about incubation time and transmission methods has been identified by many researchers. This suggests that time of incubation is between 2 to 10 days and the transmission methods are distributed to the contaminated areas, droplets and hands basically from the automatic removal of the mucous membrane. Although the Corona virus is a viral infection in which the lungs are most affected, studies show that it causes systemic illnesses where most organ systems are affected to a different degree [1]. Various factors such as patient age, immune status etc. contributes to the severity of the infection. Pre-existing cardiovascular disease such as comorbidity already worsens and worsens during or

after COVID-19 infection. COVID-19 often develops with fever, cough, dyspnoea, headache, diarrhoea, myalgia and fatigue and can infect anyone at any age. However, untreated male carriers have no symptoms. Symptom free carriers do not have clinical symptoms but are known to be contagious. A small number of asymptomatic individuals often avoid detection by public health monitoring programs. Asymptomatic carriers pose a silent threat to communities because these people may not follow risk reduction strategies Corona virus is apparently among the unknown infectious viruses, something that may be transmitted to asymptomatic patients. Symptom free carriers experience diagnostic delays and often reach a stage where the infection has adversely affected the body's immune system making it difficult to manage. Invisible patients include high lymphocyte counts, T-cells, B-cells and NK-cells. Corona virus is a coagulated, isolated, single strand RNA virus. Therefore, isolating a new virus into a known infection based on clinical presentation is not possible. Pathogenesis suggests that the SARS-CoV-2 virus binds to ACE, the target cell receptor and cause respiratory symptoms. Tests suggest that the virus causes damage to cells in the fragrant epithelium leading to odour dysfunction such as loss of smell and taste. These ACE-2 receptors are found in the epithelial layer of other organs like the intestines, blood vessels, kidney that provide account for stomach and heart problems. Immune response plays a major role in clinical outcomes. Women significantly activate more T-cells than men and activate male T-cells decreasing with age that remains stable in female patients. This suggests that male sex increases the risk of serious illness and death. From the experience of COVID-19 the world has learned to adapt to preventative conditions rather than waiting for treatment [2].

LITERATURE REVIEW

Methodology

Authors have searched for PubMed and Google experts to find articles that use keywords such as COVID-19 complication, respiratory problem, CVS problem, unmarked carriers and transmission methods. The authors included case reports, retrospective studies, prospective studies, system reviews, meta analyses, clinical guidelines and COVID based narrative reviews of its effects and problems on various body systems such as cardiovascular and respiratory systems. Pre-published articles were also included in the study. A few articles have been updated once a total of 21 articles have been selected for submission.

Respiratory complication in asymptomatic patient

As a result of a sudden diagnosis, asymptomatic carriers are diagnosed when they already have a problem; most of them are diagnosed during or after selected surgical procedures. Some of the delayed respiratory problems are severe hypoxia, pneumonia, COPD, atelectasis etc. In the respiratory tract, peak COVID viral quantity is detected while the onset of symptoms or during 1st week of disease and the subsequent decrement, indicating a very high infection before or within the first 1 day of symptoms. An important factor in COVID infection is the p fibrous mucus plug exudates presence in respiratory tract due to over production of cytokines that cause inflammation that build up in the lung and damage the parenchyma of lung. Angiotensin convertase enzyme-2 is a protein found above the alveolar epithelial cells of the lungs and enterocytes in the small intestine. ACE-2 breaks down angiotensin II, a key component of lung inflammation. ACE-2 inhibition is another factor in lung damage [3].

Patients need to be admitted to the ICU after a diagnosis. The extent and severity of COVID-19 chronic respiratory problems should be noted. Patients develop persisting respiratory symptom months after the initial sickness. Some of these chronic problems are chronic cough, fibrotic lung disease, bronchiectasis, pulmonary vascular disease [4]. Sometimes these deficiencies can be mild and involve a reduction in gas transfer. The presence of abnormal parenchymal such as low light and cord like compounds is initially seen but after 12 months this usually takes up about 10% of the lungs. Studies suggest that muscle weakness due to deconditioning was the cause of this. Corona virus attacks the alveolar epithelial cell which can lead to pulmonary fibrosis. Cell mutations that occur in aging such as genomic instability, mitochondrial dysfunction reduce the cell's ability to function properly during viral invasion and promote uncontrolled remodelling and fibrosis. This increases the chances of lung congestion. Prolonged fibrosis leads to the development of lung cancer, which can lead to problems such as blood clots in the lungs and lung infections. As pulmonary fibrosis becomes dyspnoea it gets worse or shortness of breath progresses [5,6].

Cardiovascular complication in asymptomatic patients

Asymptomatic patients often have many heart problems. These include conditions such as high blood pressure, cardiac arrest, heart myopathies namely myocarditis, endocarditis, pericarditis, Myocardial Infarction (MI), Acute Myocardial Infarction (AMI), dysrhythmias, I-Venous Thromboembolic Event (VTE). SARS-CoV-2 was detected within the pericardial fluid of patients by a real time reaction of the reverse transcriptase polymerase chain. Patients experience septic shock and multiple organ dysfunctions. The generality of cardiovascular disease in COVID is not clear still pre-existing heart disease can be associated with severe COVID infection. Alveolar and the presence of platelet fibrin thrombin in the small arterial arteries. Inhibition of ACE-2 (Angiotensin Convertase Enzyme) causes inflammation systemically with cytokine release which can lead severe respiratory depression and organ dysfunction [7]. Disruption of the immune system, increased metabolic demand and pro-coagulant activity increase COVID related cardiovascular disease 19. Systemic inflammation disrupts vascular plaque formation and viral illness increases cytokine activity which also increases cardiac

demand. Studies suggest that the virus can damage the heart directly by using the ACE-2 receptor in the heart muscle. The study was performed and found in 1527 patients with pre-existing COVID-19 hypertension where 17.1% and previous heart disease were 16.4%.

Myocardial and myocarditis injury: COVID-19 is associated with myocardial injury and troponin induced myocarditis due to increased cardio physiological stress, hypoxia or direct myocardial injury [8]. Patients with COVID-19 are present with chest pain, dyspnoea, dysrhythmia and left ventricular dysfunction. In patients with myocarditis and damage to the myocardial serum troponin value remains uncommon, ECG abnormalities are also seen.

Acute myocardial infarction: Inflammation of the system increases the risk of atherosclerotic plaque rupture. Due to severe inflammation and hyper coagulation, the risk of developing myocardial acute infection in COVID is high.

Venous thromboembolic event: Systemic inflammation, abnormal circulation, multiple limb function are all factors that contribute to the risk of venous thromboembolic formation. Higher D-dimer visibility in patient with COVID can be considered due to the development of venous thromboembolism.

Dysrhythmias: Dysrhythmias similar to sinus tachycardia caused by multiple and simultaneous causes such as hypo perfusion, fever, hypoxia, anxiety, inflammatory depression, abnormal body changes and elevated serum troponin [9].

Asymptomatic carriers mainly because of these major complications lead to high mortality rates.

Neurological complication in asymptomatic patients

Patients with COVID-19 show a variety of neurological manifestations central nervous system (25%), peripheral nervous system (9%) and skeletal muscle injury (11%). CNS manifestations include dizziness, headache. Symptoms of PNS include dysgeusia, hyposmia. Many types of syndromes were also diagnosed after COVID infection some of which are Gullian Barre syndrome, meningoencephalities, encephalopathy, encephalitis [10]. Some of the neurological problems include agitation, dissemination of corticospinal tract symptoms with improved tendon reflex, ankle clonuses, and bilateral extensors planter reflex, dysexecutive syndromes such as disobedience or random movement in response to command.

Renal complication in asymptomatic patients

Among the various problems one of them involves the kidney system. Patients with low lymphocyte count or high C-reactive protein, neutrophil count and neutrophil to lymphocyte ratio show reduced GFR. According to Taiwan Centres for Disease Control (CDC) data; approximately 60% to 70% of COVID-19 patients are undiagnosed. The disease usually occurs in critical situations. Although the varied changes in kidney function in patients with no symptoms of the disease have not yet been identified, studies believe that small differences in GFR could cause serious kidney disease [11]. Dehydration is a major cause of kidney failure. Dehydration can lead to glomerular hyper filtration and higher GFR. Infection causes kidney damage by direct attack leading to cytopathic damage or by inflammatory effects. Kidney problems are closely related to an increase in the incidence of the disease.

DISCUSSION

Transmission of SARS-CoV-2 through asymptomatic carriers

Asymptomatic carriers are those people who have no symptoms of infection but have SARS-CoV-2 with Polymerase Chain Reaction (PCR). The pathogenicity and virulence of patients with asymptomatic COVID-19 have not yet been established. Based on the genotype of 75775 SARS-CoV-2 genome isolates, it was revealed that asymptomatic infection is linked to mutations in SARS-CoV-2 11083 G>T. Ability TPO to remove the virus quickly. IGM level is very low in a group of patients with no symptoms. Complete blood counts show higher levels of lymphocytes, eosinophil's, basoples than in patients with symptoms. However, there is no difference in inflammatory cytokine markers in asymptomatic and signal carriers. Patients with no symptoms if diagnosed early before they have a problem have reduced hospital stay and patients with no symptoms diagnosed late and a problem that eventually has a longer stay in hospital [12]. A few challenges to managing these asymptomatic companies face a professional. First, as these asymptomatic people feel healthy so they move freely and do not show the fullness of the desire to get used to defensive methods such as wearing a mask, isolation from society and isolation. In addition they do not show any signs of cold and cough or respiratory illnesses, so they are considered safe by the partners around them. Most importantly as they remain asymptomatic they are often overlooked in testing and their presence in the area remains unknown. A person with asymptomatic seems to narrate almost. 40% to 45% are infected with COVID and can transmit the virus to others for a long time, perhaps more than 14 days. A few cases have been reported and confirmed that transmission is possible with asymptomatic carrier. A survey of 2685 visitors in New York was conducted which found that 38.7% of these were infected with the Corona virus. A study of Japanese expatriates in Wuhan, China estimated that 30.8% of subjects were undetectable [13,14]. Recent research estimates that COVID-19 may be highly infected 2 days before the onset of symptoms. Another study of 3184 cases in Japan identified a total of 61 cases at various public events.

Diamond princess cruise ship in Japan: 311 of 712 passengers (44%) had no signs.

Centre for skilled nurses in the USA: 13 out of 33 (39%) were undetectable.

Call centre in South Korea: 4 out of 97 (4%) had no symptoms

Iceland: 525 out of 1221 (43%) was asymptomatic.

For this reason various preventive measures were recommended by the WHO which was environmentally friendly and highly effective. One of the most important measures included hand hygiene as hands are a major source of contamination [15]. The practice of washing hand with water and soap and alcohol based antibiotics reduces the risk of infection. The implementation of this step may affect various factors such as man behaviour (laziness), wrong perception, lack of knowledge, length of improper washing time, improper bathing method etc. Lack of sinks, soap, water or tissue paper in public places. It can also be a factor in uncleanness. Because the virus is likely to live in the area from hours to days appropriate sanitation and hygiene practices in the upper areas should be developed before it can be used again. Purifiers such as isopropyl alcohol, povidone iodine, ethanol and sodium hypochlorite should be used to disinfect the surface [16]. Following are 2 basic strategies for containing COVID-19 compression and reduction using birth numbers but for different purposes. Pressure is based on strategies to keep reproductive numbers as low as possible through methods such as solitary confinement and confinement to reduce human transmission to the individual while mitigation is aimed at producing more integrated immunity by allowance of human controlled propagation and minimizing the impact. The organization has found that respiratory drops (>5 μm) can transmit virus only if a person is approximate (within 1 meter). Social isolation is also one of the most important steps in preventing infection control. Divergence reduces contact between people who may be infected and people who are healthy or between groups with high levels of infection or those who have or are not. The effectiveness of social isolation depends on a variety of parameters which is very important that it can reduce the chances of infection with asymptomatic carriers until their isolation which makes it difficult to control the epidemic [17-21].

CONCLUSION

The study concluded that there have been a number of cases that provide clear evidence that non-symptomatic carriers are the same without discrimination of symptom carriers responsible for distributing COVID-19. There have been a high number of cases worldwide in various forums that account for asymptomatic. Carriers can affect the transfer rate. Despite the reported adverse events there are many unreported asymptomatic carrier infections that suggest that the rate of transmission may increase to an unknown level if these conditions are accounted for.

A large number of human efforts and attempts have been made to control the asymptomatic carrier as early diagnosis leads to an increase in the severity of the problem. Many of these problems are irreversible and affect a person's health and quality of life greatly. The problem sometimes develops over a short period of time and causes a lot of dangerous pressure on the health worker to control the problem. These problems are sometimes catastrophic and contribute to increasing mortality rates. Eve after all research in very less time there is still a requirement to learn about the anatomy of the disease and the flexible response the patient show in its manifestation and recovery.

The measures to prevent infection reduction are the same for carriers with signs and symptoms that everyone should wisely follow, regardless of whether or not they have it.

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