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Long Term Complications Associated with Covid-19 : A Review*

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Abstract:- The covid-19 has spread rapidly throughout the china and globally. This highly transmissible disease till date has infected around 17 million people worldwide. The infection spreads through the sputum or the droplets generated by the infected person by sneezing, coughing or talking. The droplets can settle down on the surfaces and floors or can remain in air where the viability of the virus varies from few minutes to several days. People can also get infected on coming in close proximity of the infected person. The patients experience mild to high fever, sore throat, headache, myalgia, tastelessness and shortness of breath along with pneumonia like symptoms in serious cases. A large number of asymptomatic cases were also reported making the detection difficult in early stages. The recovery rate as of now has reached to 78%, and fatality rates are low, still people are prone to various other long term symptoms after recovery which is a matter of concern. The researchers and scientists have found prominent effect on nervous system and other vital functions of the body, this article gives a brief review of such complications.

Keywords:- *Covid-19, SARS, MERS, Pandemic.*

I. INTRODUCTION

COVID-19 is caused by SARS COV 2 of the corona virus family. The incubation period of the virus may vary from 2-14 days. The severe acute respiratory syndrome (SARS) and Middle east respiratory syndrome (MERS) emerged in 2002 and 2012 respectively , both of them are also caused by corona virus and have similar clinical features as covid-19 .The first case of covid-19 was found in the Wuhan province of china , originated by sea food market . Cases began to rise gradually and it was declared as a pandemic by WHO on march 11[1][2]. This pandemic has affected the whole world socio economically, mentally and physically so far. Currently no therapy or vaccine has been approved by WHO for the treatment of the disease though various measures and strategies have been designed to control the spread like social distancing, surveillance, quarantine and usage of certain medications and life support systems to reduce the symptoms and accelerating the recovery yet a solid treatment regimen or vaccine is needed to limit the spread. Recovery rates are rising but the lingering effects after months of recovery are being reported by the patients. Though it is very early to get the complete information about the virus and other long term complications but many studies have reported effects of this infection on nervous system, cardiovascular system , respiratory system and many other vital functions .[1][2]

II. EFFECT ON NERVOUS SYSTEM

Blood, cerebrospinal fluid serves as the entrance medium for the SARS cov-2 into the brain. On entering the brain the virus damages the neurological network and lead to neuropathy and neurological manifestations. The short term effect includes inflammation of the brain parenchyma leading to the brain targeted autoimmune response in susceptible individuals, whereas the long term effects includes disturbances in cognitive and emotional behavior. Evidence of cov-2 entering the brain via respiratory tract have also been found. In a study patients in ICU have shown certain symptoms like agitation and confusion.[3] Olfactory and gustatory dysfunctions are reported in mild to moderate cases. [4]The fact that systemic inflammation, cytokine storm has been shown to promote cognitive decline and neurodegenerative disease makes it likely that covid-19 survivors will experience neuro degeneration in the following years. Development of ARDS (Acute Respiratory distress syndrome) is also found to be associated with cognitive impairment and reduced quality of life persisting months and years after hospital discharge. Also strong evidence have been found that patients surviving COVID-19 are at a high risk of developing Alzheimer's Disease.[5]

III. EFFECT ON THE CARDIOVASCULAR SYSTEM

Various studies have proven that this infection leads to complications in the cardiovascular activity and further contributes in worsening the preexisting cardiovascular diseases.[6]

It is evident from the studies that 35% of the patients who died of covid-19 were detected with the presence of virus in the myocardium.[7] The SARS Cov2 has found to get attached to ACE 2 which is a cardio protective transmembrane protein, down regulating its cardio protective action. The survivors also suffered from cardiac diseases including arrhythmias, myocardial infarction, sudden cardiac death and systolic and diastolic functions.[8]

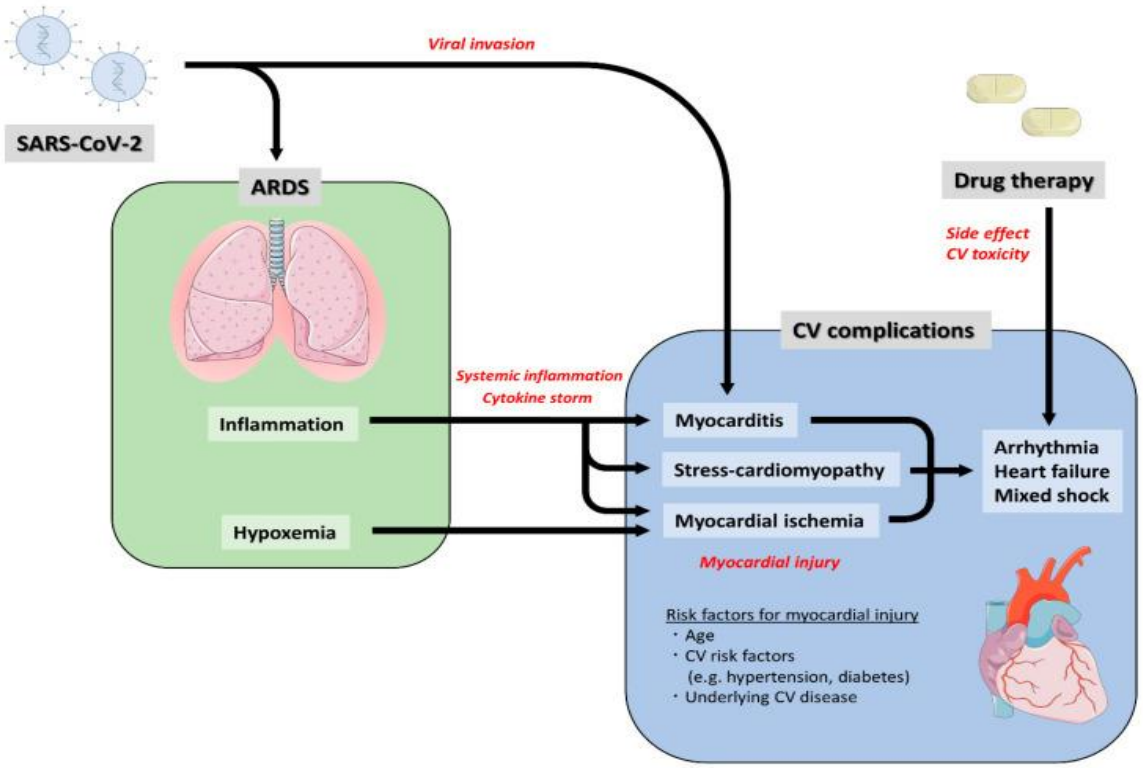

Fig 1

IV. POST COVID-19 SYNDROME/ CHRONIC FATIGUE SYNDROME

Most of the people who recovered from covid-19 experience chronic fatigue. This kind of issue has been observed in case of various other epidemics too. The researchers found that more than 50% of their study sample experienced fatigue throughout their recovery .It is suggested that hyper inflammation and cytokine storm due to infection can contribute to such complications .[9]

Many of the covid-19 survivors have reported that though they have been tested negative for covid-19 but they do not feel completely healthy and are unable to get rid of the sickness and fatigue even after months of recovery.[10]

V. EFFECT ON RESPIRATORY SYSTEM

The SARS Cov-2 alters the normal functioning of various organs but the major impact of the infection is found to be on lungs. As it is reported that SARS cov-2 gets access to the host cell via ACE-2, which is abundant in the alveolar cells, invades the lung parenchyma, resulting in severe interstitial inflammation of the lungs. This is evident on computed tomography (CT) images as ground-glass opacity in the lungs.. This leads to the respiratory manifestations like cough , shortness of breath , nasal congestion etc.[11] Reports suggests that these symptoms prevails after the recovery in approx 30% of the patients for longer durations. [12]

Post covid fibrosis/ acute respiratory distressed syndrome is common condition in covid patients which is irreversible.One of the possible reasons suggested by experts for this is that corona virus causes chronic inflammation in epithelial injury and fibroblast activation.[13]

VI. CONCLUSION

This pandemic has not only caused physical damage , but also socio economical and mental damage to the world . It is evident that large number of patients are suffering from post covid syndrome which includes effects on the vital functions of the body. Many of the covid survivors have reported uneasiness after short interval of recovery, some of the patients have told that the after effects were much more intense than the actual infection and persisted for 7 to 8 weeks or longer . Right now we are at a very early stage of a novel disease, the virus is rapidly changing and a lot of information is still unknown, a lot of research is needed to manifest the long term impact . Scientists are working round the clock to anticipate any further parallel features between Covid SARS and MERS based on the history of the virus as the inflammatory damage is similar in all the three conditions. Reliable treatment for the disease is yet to be discovered. Hundreds of trials are going on around the world for making an dependable and effective vaccine to get control of the situation and regarding the long term effects of this disease, besides accelerated drug approval regulations, much more time will be required, in such condition preventive and protective measures are the key . Following government guidelines and immunity boosting therapies are important. Well

structured studies and researches are required to not only curb the current pandemic but to also prevent the future outbreaks.

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