

COVID-19 and Its Current Trends with Long Term Implication

AkshadaMahadik

Medical Intern, Department of Community Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences (DU), Sawangi (Meghe), Wardha, Maharashtra, Pincode-442001, India

email id: mahadik.akshada@gmail.com

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ABSTRACT

BACKGROUND

The coronavirus disease 2019 or COVID-19 is a serious medical threat that is posed before since more than a year. Scientists and researchers from all over the world are working on the solution on the ongoing problem.

SUMMARY

The mutated strain of the novel coronavirus has been successful in creating a buzz around the circuit of concerned people. The COVID-19 is being uncertain throughout its stay and any prediction would possibly go wrong. Long term implications may lack some major study but many lessons and parallels can be drawn from the previous similar outbreaks of SARS and MERS.

CONCLUSION

More fact based along with broad based study is needed to understand and correlate the COVID-19 and its long-term implications.

KEYWORDS: COVID-19, PRECAUTIONARY MEASURES, MUTATION, PANDMEIC.

INTRODUCTION

COVID-19 or coronavirus disease 2019 is the one of its kind diseases outbreaks. Extremely high virulence and capacity of producing lethal outcomes is what makes the novel coronavirus deadly and most feared virus outbreak of the century. The COVID-19 is proving to be the deadliest event in the past century and till now has taken more lives than any other event or disease outbreak. As of January 11, 2021, 88,828,387 people are infected with coronavirus disease 2019 caused by novel coronavirus and 1,926,625 are the number fatal clinical outcome among registered number of cases(1). The case fatalities are inching towards two million mark and is extremely serious cause of concern among containment authorities. United states of America, India, Brazil, Russian federation, France and United Kingdom are the top six countries affected by the pandemic at the current stage(2). In fact, they make up for more than half of the all the infection reported all over the world and also

accounted for more than half case fatalities due to COVID-19 related complications. The case fatalities are mostly of comorbid and mostly old aged patients. Underlying medical conditions can make or break the situation after the infection from the virus. Most severe clinical outcomes are developed in patients having any kind of underlying medical illness or comorbidity such as diabetes mellitus, cardiovascular ailments and so many more. Human coronaviruses are not new and had caused many previous outbreaks such as severe acute respiratory syndrome (SARS) and middle eastern respiratory syndrome (MERS). But the most lethal has been COVID-19 pandemic. The severity of the disease was such that World Health Organization (WHO), on March 11, 2020 has to declare it as pandemic. The status previous to pandemic was public emergency of international concern (PHEIC). The virus mechanism and current state of the pandemic is same and different respectively. Viruses mechanism

of hijacking the host and taking control is still there but there has been major change in various other outbreaks. Various long-term implications are attached to the virus infection which are hard to carry on and interferes with the process of getting life back on track. Therefore, it is necessary to prevent the disease from happening and avoid connected consequences which will affect the functioning of the body. In this article a comprehensive overview has been taken in order to develop acumen about coronavirus and its impact.

BACKGROUND OF THE CORONAVIRUSES

COVID-19 or coronavirus disease 2019 is wreaking havoc all over the world. The lethal nature of the pandemic and the high virulent nature makes it the one and only kind of pandemic in the past century. In fact, COVID-19 has taken more lives than any other nature or man-made event in the past hundred years of human history. The initiation in china has now occupied almost each and every corner of area inhabited by people. The human versions of the coronaviruses are not a new phenomenon. Many other strains of the coronavirus were already present in the human body but humans adopted to live with the viruses. Most of the previous strains of the coronavirus has been considered as extremely normal and did not caused any harm and some of them were even not showing their symptoms. From the discovery of the coronavirus in mid-1960 when strange flu like symptoms was observed in various parts of the Europe. There it shows that coronavirus has long history(3). It was not categorized as killing virus or lethal virus until 2003 when severe acute respiratory syndrome (SARS) outbreak took place in several part of china and south east Asia. Many people were infected but it was confined to one part of the world as its virulence was way less than the novel coronavirus. SARS-COV caused the SARS outbreak

and from then the coronavirus was categorized and considered as lethal disease because the casualty was huge and was around ten percent of the total infected people. Around eight thousand people were infected and eight hundred of them died due to SARS-COV related complications.(4) Although the casualties seem to way less than the current SARS-COV-2 but the case fatality rate is huge standing at ten percent. This has huge impact on the research and developmental activities about the coronaviruses and researcher got new opened new windows in further study. This outbreak was followed by another outbreak in 2012 when the cases of middle eastern respiratory syndrome (MERS) broke out in parts of gulf countries particularly in kingdom of Saudi Arabia. This the Arabia infected patients were less as compared to novel coronavirus infected patients but the case fatality rate was high and touched thirty five percent of the total number of infected patients from the MERS. The fatalities were high among the elderly and the preventive measures were not followed properly as the novelty of the MERS back by then was huge. These events are the precedent of the coronavirus related disease and the COVID-19 or coronavirus disease 2019 that is currently spreading all over the world. These events have lot to offer us in terms of lessons that will help in containing the virus(5).

VIRUS MECHANISM AND CURRENT STATE

At current stage COVID-19 has been spread to all human inhabited parts of the world. It has spread over 200 countries and regions of the world. Even the remotest part of the Antarctica where various countries had established the study mission on the antarctica, has been experiencing the infection case reporting. More than eighty five million people has been infected which is huge number and unprecedented one as no other disease

outbreak or epidemic has crossed such infection numbers. Case fatalities is approaching to unfortunate mark of two million. The uncertainty attached to the pandemic is still large and any attempt of the prediction of the outcome of the event would be a mistake as the chances are high that it would go wrong. The mechanism of the virus is scientifically explored and decoded. Virus is in inactivated state if no host has been attached so far. As soon as the host acquired the infection, the virus starts its job. Human body contains angiotensin enzyme receptor 2 (ACE 2) receptors at various organs which are crucial in the functioning of the human body. ACE 2 receptors act as the gateway for the novel coronavirus and facilitates its entry into the cell. The spike protein gets attached to the ACE 2 receptors and takes control of the host cell(6). Then quickly virus starts to duplicate and spreads and takes control of other cells too. This affects the functioning of the cells and interferes with protein synthesis process of the body. Many countries are still reporting massive surge in the new cases and it seems that pandemic of the COVID-19 is far from over. Some countries reported no new cases from past few weeks. They are six in numbers from more than 180 countries around the world. 69 countries showed few rises in cases of COVID-19 infection, 9 showed same number of cases as before and 62 countries showed more new cases than before. But the matter of concern is that whopping 24 countries has shown twice as many as new cases than before which is also a serious cause of concern. Although accuracy matters in the reporting of the case numbers. The countries that reported twice as many as new cases than before are mostly from African continent. They also have certain degree of commonality like ongoing civil war, presence of terrorism, weak political system and so on. Six nations that reported no new infection are Laos, Vatican, Marshall Islands, Samoa,

Solomon Islands and Vanuatu. The new mutated strain of the coronavirus has been reported from several countries. Symptoms are also updated regularly as new symptoms are cropping up day by day. Initially flu like symptoms such as cough, cold and fever were treated as supposedly COVID-19 infection. But later on, various symptoms were also started to be reported which were also recorded. They are diarrhea, vomiting, nausea, intermittent loss of test and smell, fatigue and so on. Various vaccine candidates have already applied for the approval from various drug controller authorities around the world to safely deliver the vaccine shot. Priority group is on the first on the list of the to be vaccinated people. Several countries have already started the roll out of the vaccine and distributing the same to people(7).

LONG TERM IMPLICATIONS ATTACHED TO COVID-19

Till few days back it was widely assumed that the worst thing and where situation is either made or not. But it is necessarily not true. Certain other factors are also playing role in deciding post illness life of infected patients. It has been a year since the COVID-19 pandemic struck the humanity and still affecting the human lives adversely. The case number of newly infected cases has been still rising. But the number of cured patients is also increasing. Also reporting certain medical problems has been started to arise post illness. This includes extreme fatigue, intermittent loss of test and smell, reduced physical capacity, hypertension, brain fog which is actually a difficulty in decision making and reduced cognitive and motor function. Also, after several medical examination various other persisting medical condition has been found such as weakening of the cardiovascular muscle, inflammation of the heart muscle, abnormalities in functioning of the lung, weakened alveolar tissue resulting in the affected functionality of the diffusion of

oxygen and carbon dioxide, acute kidney injury, persistence in loss of smell and taste, depression and anxiety were found(8). These are some serious implications and needs to be addressed as soon as possible. Many patients have been reporting the symptoms and especially reported severe reduction in physical and mental abilities. Sports affected are higher risk as they have to constantly maintain their physical fitness and psychological resilience. All COVID-19 induced lockdown has already taken toll on their physical fitness as the movement restrictions were imposed all over the world. Sportsperson were unable to go out and continue their exercise. The long-term implications attached to disease caused of member of coronaviridae family of the viruses is not new. In fact, previous outbreaks of severe acute respiratory syndrome (SARS) and middle eastern respiratory syndrome (MERS) infected patients were reporting such symptoms back by then when these outbreaks happened. Several studies conducted after these outbreaks to assess the impact of the disease outbreak among the patients. The assessment was not complete until after assessing the patient's response after almost two years post discharge. The follow up study was conducted for continuing for several months after the illness. A study conducted among the survivors concluded that 52 percent of the SARS survivors were deeply affected. This cohort study suggested various health care professionals were unable to resume their work. A large amount of health care professionals almost 30 percent of them were unable to return to work. More than half of the population were having abnormal diffusing capacity for carbon monoxide also known as DL_{CO} . This was checked after 24 months that is two years after the illness(9). Impairment in interalveolar pathways was also seen as consequence of the SARS disease. Normal populace was also affected by the after

effects of the SARS. This includes extreme fatigue, post illness depression, anxiety, weakening of the cardiovascular muscles, renal impairment, reduction in physical capacity. The condition of spirometry and lung volume reduction and impairment were also among the long-term implications that were seen among patients. The CXR scores were found to be abnormal in 33 and 28 percent along the course of six months and twelve months respectively. Bronchial fibrosis was also suggesting the negative and adverse impact of the persistence of the SARS. Impact on physical exercise persisted for 14 months post illness(10).

Same phenomenon of the persistence of post illness disorder continued in recent coronavirus disease 2019 pandemic. Several cardiovascular, pulmonary, respiratory, renal and psychological disorders are also associated with COVID-19 too. The main gateway or the entrance of the virus that the angiotensin enzyme 2 receptors that help in getting the virus into action made are found in abundance on cardiovascular as well as alveolar tissue. Transmembrane protein that protects the cardiovascular membrane is highly affected by the viral attack of the pathogen SARS-COV-2. Also, its association with the SARS-COV outbreak has been concretized as myocardial injury was also reported in SARS outbreak. In a study, it has been found that 7 out of 20 patients which died due to complications attached to the disease have SARS-COV genome in their heart. Myocardial inflammation has been reported in COVID-19 infected patients which lasts for few months even after testing negative for the SARS-COV-2 virus. Myocardial interference by the virus also decided among patients infected with virus, the clinical outcome in which the person having infiltration in myocardium has greater chance of fatal outcome than the those who are infected with SARS-COV-2 but having no such infiltration. Almost 5 percent more than the quarter

patients were found to be infected with myocardial involvement and also increased troponin quantity. Also, the outcome was less favorable to be converted to fatal one in the infected patients but having controlled levels of troponin. Higher fatalities, malignant arrhythmias and respiratory distress was found to be associated with increased troponin levels. Coagulation was higher post illness also and needed medical attention at regular intervals. Although major study is not present at current stage as pandemic of the COVID-19 is still evolving. But many lessons can be drawn from the previous outbreaks of SARS and MERS(11).

The less talked about implications of the post coronavirus disease 2019 is its psychological impact. The impact that is taken by the mental health is of huge nature. During the treatment and post infection the long isolation period has been already found to be taking toll on the psychological state. Loneliness and depression are attached to the disease as one has to be either quarantined or isolated. The distanced family members which are also kept faraway from the infected person also contributes to the mental stress. In addition, the uncertainty induced by the COVID-19 and its never-ending spread of the disease disheartens the mood. Especially in the athlete's case where they have to maintain good physique as well as endurance. Already COVID-19 induced lockdown has prohibited the athletes from going out and continue their exercise and workout. Now if sportsperson is infected with the disease then he or she may have to face additionally the stress of missing out workout sessions while undergoing treatment and also chances are high that they develop the potential long-term implications and associated disorders(12).

PRECAUTIONARY STEPS AVAILABLE IN COVID-19

The huge uncertainty attached to the virus and its high virulence along with lethal nature has mandated the best of avoiding such severe consequences and that is preventing the COVID-19 from happening at first place. Various guidelines are in place in order to aware people about how they can prevent themselves from getting contracted from the disease. World Health Organization along with other governmental and health care authorities has formulated some of the measures which can be undertaken in order to safeguard oneself from the disease outbreak and long-term illness associated with it. Various non-pharmacological interventions were in force from governmental side to be followed by the people to break the chain. This includes lockdown and movement restrictions which were sustained for not long time. As the coercive measures are not meant to be last for long. Therefore, other non-coercive measures such as wearing mask at public places, maintaining physical distancing while in crowd, personal and protective equipment's kit also known as PPE kit, face shields are being popularize to gain traction among masses(13). These measures are tried and tested and need not be tested again and can be directly used as mitigation measures. These measures are quite good and sustainable and can be found to be beneficial in long term as other communicable disease are also prevented from happening(14-17). The news about vaccine development is in final stage but vaccination of more than seven billion people is far from over. The priority wise vaccination will take time and the chance of increasing infected cases will be still high for considerable amount of time. Therefore, it is necessary to follow non-coercive guidelines enforced by various enforcement agencies(18-20). Preventive measures are the only way to ensure safe survival in the lethal pandemic time and it will safeguard us from various other preventable disease (21-23).

CONCLUSION

The mutation in the novel coronavirus is the latest update in terms of the structure of the virus. Although mechanism is same in both the strains. The new strain is extremely virulent and approximately spreads seventy times faster than the present strain of the coronavirus. Long term implications are not new in human coronavirus strain causing disease but the COVID-19 case fatalities and other factors may raise the concern of the medical as well as research fraternity around the world. Sportspersons needs to be extra aware about their surrounding condition as their physical capacity is adversely affected after contracting infection. Elderly and comorbid people also need to be cautious as they are extremely vulnerable to developing severe clinical outcomes. Preventive and precautionary measures are the best suited for the contagious and lethal pandemic like COVID-19. This not only benefit in current pandemic situation but in long run too. As the saying goes, prevention is always better than cure and it is a perfect fit for pandemic like COVID-19.

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