



The Emergence Role of New SARS-CoV2 Variant of Concern Omicron (B.1.1529) as a Boon or Curse: Treatment Strategy

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Abstract

According to the World Health Organization, Technical Advisory Group on Virus Evolution declared Omicron as a variant of concern on 26 November 2021. It includes about 26-32 mutations in the spike protein that might be linked to the immune invasion and enhance the mode of transmission among the individuals. The preventive measures have been taken in order to prevent the COVID-19 such as face mask, use of social distancing, and hand sanitizer. The main objective of routine immunization is to control the following COVID-19 waves. This review highlights the current data on epidemiology as well as implementation plan for the prevention of omicron variant.

Keywords: World Health Organization; Omicron variant; Spike protein; COVID-19

Introduction

The initial Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV 2) was discovered in the year 2019 with a number of variations. Almost about the two years ago the COVID-19 has been increasing tremendously day by day. As per as World Health Organization data 260 million cases were confirmed and reported also with a 5 million cases of death were also reported. The WHO has categorized the variants into three groups such as Variants Of Concern (VOCs), Variants Of Interest (VOIs) and Variants Under Monitoring (VUMs). To linked with this variant of concern are divided into four types such as Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1) and Delta (D.1). These all variants gives rise to the new pandemic that involved the thousands of deaths in numerous countries and areas [1]. The

World Health Organization named omicron (B.1.1529) as a variant of concern because it has a capacity to spread the disease more easily also entering into the immune system and invade the biological healthcare system. The monitoring and analysis of SARS-CoV-2 mutations and variations can be explained by the Figure1.



Figure1: Monitoring and analysis of SARS-CoV2 mutations.

A new SARS-CoV 2 named omicron was developed on 26 November 2021. Omicron was formed into the COVID-19. It widespread across the globe and causes the adverse effect on social, economical and emotional consequences into the population worldwide. Studies reported that omicron arrives when routine immunization is increasing among the population worldwide [2]. The World Health Organization (WHO) and genomic sequence organization worked in collaboration and continuously checking the alterations in SARS-CoV2 and notifying the different countries about the alterations in virus and also prevent it from spreading widespread. It was observed that from January 2021 various viral alterations have been grown with the alpha, beta, gamma and delta forms. As the alpha, beta and delta forms are known as variant of concern because it causes new infections, spread the disease and has ability to escape the natural immunity also having the viral activity. According to the studies the delta variant of concern is becoming a common variety in worldwide. The UK Security agency stated that the mutation in virus has been considered the variant of concern as it causes the changes in spike protein that interacts with the cells of human and permit the virus to enter. The mutation of virus can causes the spread of infection and weaker it effectiveness on treatment.

Materials and Methods

History of omicron

As per as the report of World Health Organization Omicron was first identified in the sample on 09 November 2021. However the sample was collected from the Botswana on 11 November 2021. The omicron was identified and detected and mutation of omicron spread frequently among the population. The study was performed on the 77 samples of virus that collected from the Africa Gauteng from 12 November to 20 November 2021. After the collection of sample the results were analyzed and identified the new variant of COVID-19 Omicron in younger group of Africa Gauteng. Moreover the studies reported that the findings of omicron were linked with the cases of COVID-19 that spread in South Africa. Once the omicron was identified it tremendously increasing its void cases day by day. The statically data reported that on 26 November 2021 the cases of omicron was 2000 and on December 3 2021 it rises upto 10,000. The World Health Organization obtained its first case of severe acute respiratory syndrome on 29 November 2021 as a variant of concern from South

Africa and spreads into different countries such as Austria, Australia, Germany, Italy and United Kingdom.

The main principle behind the omicron is to concern about its spreadness and infection whether it causes severe infection or not. The effect of transmission in omicron is also a variant of concern amongst people [3]. If the mutations are altered and overlapped than there is a high risk of transmission and side effects may occur. As the studies reported that the cases in South Africa is increasing day by day as Polymerase Chain Reaction (PCR) are failed to detect the S-gene target protein. The transmission of omicron variant is still unproved whether the transmission of omicron is more powerful than variation of delta form or it can harm the natural immunity [4,5].

In my point of view, omicron has ability to mutate thus it showed a positive response on its severity of spreadness. Scientists stated that omicron has more than 30 mutations and deletions that can bind with the forms of alpha, beta and delta respectively. These mutations have capacity to bind with the receptors and make it powerful in terms of binding of viral activity. The receptor binding protein interacts with the Angiotensin converting enzyme 2 that interacts with the host cell and allows the entry into the human body with alteration and resulted to cause infection and severity of virus [6].

Epidemiology of omicron variant

As per as the source of World Health Organization the omicron was identified in 110 nations around the world on 23 December 2021. The mutations in omicron have become dominant in various countries. Initially the cases of COVID-19 were decreased in South Africa as Omicron, new variant cases were reported. On 13 to 19 December 2021, a total 162987 cases were observed. According to the data of World Health Organization on 18 December 2021, a number of cases of omicron were observed more than before. Kenya and Malawi were the two countries where the cases of omicron to be reported [7]. At the beginning of 2022 omicron is to be predicted to replace the delta form and leading a major cause in other countries. Scientist reported that from 15 December 2021 to 21 December 2021 the cases of omicron are increasing rapidly.

Clinical diagnose and Prevention of omicron variant

In terms of Clinical diagnose omicron is detected by NAAT, PCR test or detection of antigen techniques in South Africa. According to the hypothesis of researchers it is believed that current treatment, precautions and medicine will longer be used to treat the Omicron variant. Moreover public health preventive methods such as wearing of mask, hand sanitizer and social distance that have been shown remarkably positive effect on preventing omicron virus. Generally it is recommended that omicron spread faster and break the antibodies that might cause reinfection. Studies reported that individuals who have been vaccinated and treated have significantly a lower chance of omicron infection. Vaccination along with safety measures is expected to be an effective prevention from omicron infection [8]. As per as suggested by World Health Organization (WHO) the PCR techniques is used to diagnose the SARS-CoV2 omicron variant. The Phylogenetic Assignment of Named Global Outbreak is a software tool associated with pattern of genomes also stated that BA.3 has 69-70 deletions among the spike protein but in omicron variant (B. 1.1529) with the deletions of 69-70 genomes [9]. The occurrence of deletions in spike protein 69-70 may leads to the negative impact for the S gene target. The failure in the S-gene target could be implemented as Omicron variant as these deletions can be seen in previous variant of concerns.

previous variant of concerns. The omicron has two variations in their nucleoplasmid protein such as G204R and R230K. Moreover sequences of omicron has deletion of amino acids at the position of 31-33. The change in the nucleoplasmid protein will have an impact on antigen rapid diagnostic test will un-cleared for now [10].

Results and Discussion

For the prevention of Omicron many countries have banned the flights and people who travel to and from South Africa enforced a quarantine of 14 days on tourists who is travelling from omicron infected areas. Travelling should be restricted among the borders in order to sustain the immunity among the SARS-Cov2 virus. As per as the World Health Organization (WHO) the analyzing of omicron against severity and transmission will take a couple of weeks. Moreover the hospitals in South Africa have already been reported with the increased cases of COVID-19 between the ages of 20 to 30 years [11]. Genomic studies reported that the individuals who are unvaccinated are more prone to infection then vaccinated. The preliminary reports stated that in South Africa approx 35.7 individuals are vaccinated. It is important to provide the vaccines amongst the individuals or patients so to get the rid of omicron infection.

Many of the countries reinforced the preventive measures to prevent the infection of omicron amongst the individuals. The World health assembly or World Health organization indicates that variations in the protein may lead to the new COVID-19 variant omicron that can spread more fastly and started the conditions of pandemic again. Due to increase in number of cases many of the countries including India will enforce night curfew and also banned the schools and colleges.

Omicron testing in laboratory

The testing can be used to confirm the expected and confirmed cases of omicron. To confirm the existence of omicron both targeted and untargeted spike protein is appropriate for testing. It is advice that diagnostic protocol should contain single Nucleotide Detection Test (SNP) to monitor the sample of omicron [12]. It is observed that majority of the countries play an important role in detection of omicron variant. The national testing agencies appropriately planned the strategies testing for the local and the international travelers. The testing should link up with the efforts of public health in order to ensure the supportive care in terms of omicron variant.

Therapeutic treatments available for COVID-19 as omicron variant

To analyze the possible effect of omicron variant in terms of treatment vaccines such as Pfizer and Biotech plays an important role in curing the spread of virus. Moreover the previous studies reported from the COVID-19 stated that IL-6 and corticosteroids are the two medications available to cure the spread of omicron as they have the ability to decrease inflammatory response of the patient to the virus [13]. The World Health Organization and the other health agencies worked together to outreach the effectiveness of treatment for new variant. On 16 December 2021, Roche gave a statement on Ronapreve a monoclonal antibody (casirivimab and imdevimab) that it reduces the activity against the omicron variant [14]. Roche a biotech company observed on daily basis that Ronapreve activity against the variant of concerns is decreasing [15]. For the therapeutic treatments that available for COVID-19 as omicron variant we studied different previous articles and collected data from World Health Organization. The summarized data is given in Table 1.

S.NO	Actively medicinal products	Pathological role in covid-19 and omicron variant
1	Dexamethasone	Dexamethasone is a corticosteroid drug used as an anti-inflammatory agent and it is used to treat several of diseases. According to the randomized clinical trial Dexamethasone is used in COVID-19 by reducing the death rates in patients by supplying the oxygen
2	IL-6 Inhibitors	Tocilizumab and Sarilumab are the two monoclonal antibodies that block the IL-6 receptors [16]. It is given in the patients with COVID-19. Data has been shown that these two drugs were seen to be beneficial in treating COVID-19
3	Janus Kinase Inhibitors	Baricitinib is an anti-rheumatic medication which is an oral Janus-Kinase inhibitor. It plays an important role as an anti-inflammatory agent. According to the scientist it is proposed that Baricitinib have an antiviral activity by inhibiting the SARS-CoV 2 infection by entering the infection into the lungs [17]
4	Casirivimab and Imdevimab	These two drugs act as the human-immunoglobulin (IG1) monoclonal antibodies. They connect with surface antigens of SARS-CoV2 receptor. The main role of neutralizing antibodies is to prevent the virus from entering into the host cell [18,19]
5	Molnupiravir	Molnupiravir is a prodrug that converts into the N-hydroxytyridine that found in the human body. It works on the mechanism of mutations that results the change in virus and also inhibits its replication. Studies has been proven that it improved the patients with COVID-19 those who are hospitalized and at the risk of severe disease
6	Nirmatrelvir	Nirmatrelvir is a protease inhibitor drug that protects the SARS-CoV2 virus from multiplying. It is reported that Nirmatrelvir reduces the risk of hospitalization in patients who are suffering from COVID-19

Table1: Therapeutic treatments for COVID-19 as omicron variant.

Role of vaccines in omicron variant

In order to treat the COVID-19 the public health authorities increase their efforts on the vaccination rates among the different age groups such as old-aged people, health care workers and those who have chronic illness. According to the reports vaccines are highly effective against the delta and it is also further investigated that vaccines are shown effective against the omicron variant especially in the case of severe sickness. Moreover it is hard to believe that currently vaccines can provide the prevention against the omicron variant. To understand the better physiology of omicron against the vaccine more research to be conducted on this. According to the World Health Organization data is supposed to be available within few weeks [20,21].

Conclusion

In this review we concluded that World Health Organization has already warned about the mutations in the binding domain protein of S80 that could allow the rise of new variant Omicron to spread more easily amongst the individual and started the pandemic if it is not controlled within the time. Moreover the effect of vaccines against the

omicron is still unknown. Therefore many of the preventive strategies have been taken to control the rise of infection of omicron.

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