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Review Article

New Sars-Cov-2 (B.1.1.529) of Concern Omicron Alert was Given in the World

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Abstract

While the World Health Organization was just starting to recover itself after the coronavirus pandemic that started two years ago and killed more than five million people, The new variant of coronavirus has been classified by the World Health Organization in the category of a variant of concern. He named the new variant, the 15th letter of the Greek alphabet, Omicron. B.1.1. To determine the severity of the variant, also known as 529, our investigation includes where and when the Omicron variant occurs with its high spread rate, ability to evade both double dose vaccination and the body's immune system, and its difference and importance from other variants (alpha, beta, gamma, delta). We also conclude our most effective methods and recommendations in the fight against the epidemic.

***Keywords:** The World Health Organization, South Africa, SARS-CoV-2 (B.1.1.529) Omicron, The other variants.*

Key Findings

⇒ The World Health Organization (WHO) has identified B.1.1.529 as an alarming variant called 'Omicron'. The WHO announced that variant B.1.1.529 was first reported on 24 November 2021 from South Africa. A sharp increase in infections has been observed in recent weeks, coinciding with the detection of the B.1.1.529 variant. The first known confirmed B.1.1.529 infection was detected in a sample collected on November 9, 2021 [1,2].

⇒ Surveillance and sequencing studies need to be continued to better understand the SARS-CoV-2 variants circulating in the community [2].

⇒ Spike protein plays a key role in the new type of coronavirus to enter our cells. As the number of mutations of the virus increases in protein projections, the risk of losing the effectiveness of vaccines increases with each passing day [3].

⇒ The Omicron variant is a treasure trove of mutations with more than 50 mutations, including at least 32 in the spike protein and 10 in the receptor-binding site [4].

⇒ Epidemiological data and information about the course of the epidemic should be shared at least weekly by international scientific standards [5].

Introduction

The Coronavirus (Covid-19), which first appeared in Wuhan, China in the last days of 2019 and spread to the world from there, continues to be the number one common agenda of our planet. The virus, which continues to appear with new variants, has infected more than a quarter-billion people around the world, and more than 5 million people have become victims of the virus. The Covid-19 epidemic, which has important social and economic, effects as well as affecting health services and daily life in the world, continues to maintain its effectiveness and place on the agenda despite vaccination studies and protective measures [1,6]. While the Covid-19 epidemic continues with a high rate of delta variants in all countries, On 26 November 2021, WHO defined a new variant (B.1.1529 variant) Omicron, which consists of the Greek letter "όμικρον".

It has been reported that the new variant may be reinfectious and have high infectivity, but its effect on morbidity/ mortality is still unknown [5]. It has been reported that this variant, which emerged as a result of genetic changes and mutations and gained new features, showed two main and 'exotic' molecular features. These features are from the mutation medium found in S1 (e.g., G339D, S371L, S373P, S375F, K417N, N440K, D796Y, N856K, Q954H, N969K, L981F) and an insertion combination. Receptor Binding Domain (RPD) and S2 sites have also been identified, including Zeta, Eta, Theta, Iota, and Kappa (Table 1). The effect of this mutational algorithm on Omicron-mediated infection, morbidity, and mortality have yet to be determined [7].

Table 1: SARS-CoV-2 variants and mutation algorithm [7].

SARS- COV 2 Spikes (S1/S2	SARS- COV 2	S1 RBD									S2
		DELETIONS/INSERTIONS			POOINT SUBSTITUTIONS						
Alpha	B.1.1.7	69del	P6S1H		N501Y	A570D	D614G	E484K	T716I	S982A	P6S1H D1118H S494P K1191N
Beta	B.1.351	241/4del	142del	243del	N501Y	A701V	D614G	E484K	D215G	K417N	DS0A
Gamma	P.1				N501Y	L18F	D614G	E484K	T1027I	K417N	D138Y R190S H655Y P26S T20N
Delta	B.1.617.2-.3	156/del	142del	243del	T478K	L452R	D614G	C142D	D950N	T19R	P6S1R R158C E484Q
Epsilon	B.1.427-.429				S13I	L452R	D614G	W152C			
Zeta	P.2				F565L	V1176F	D614G	E484K			
Eta	B.1.525	69del	70del	144del	N501Y	A67V	D614G	E484K	Q677H		
Theta	P.3	141del	143del		T95I	P681H	D614G	E484K	G593G	8875S	
Iota	B.1.526				T95I	L452R	D614G	E484K	D253G	L5F	D950H F157S A701V T859N D80G
Kappa	B.1.617.1				F490S	L452R	D614G	G142D	E154K	E4S4Q	P6S1R Q1071H
Lambda	C.37					L452Q	D614G				
Omicron	B.1.1.529	69del	70del		T95I	G339D	D614G	G142D	S477N	G446S	Q493K N856K N969K H655Y
		141 del 211del	143del 212del	in:214EPE	N501Y T478K	P681H A67V	S371L S375F	E484A G496S	D796Y Q498R	K417N N440K	T547K N764K Q954H L981F Y505H N679K D796V S373P

The Omicron variant has the most mutations of Covid-19. However, it is not known how much these mutations (genetic changes) will affect the behavior of the virus. Delta: It had 13 mutations. Nine of these are in the spike protein, which helps the virus bind to human cells, and specifically helps it adhere more firmly to cells. Omicron is a treasure trove of mutations (32 in the spike protein and 10 in the receptor-binding domain) with more than 50 mutations [4,8]. T478 is a common mutation in Delta and Omicron variants. A large number of mutations in the receptor-binding site of the spike protein in Omicron compared to the delta variant (Figure 1) suggests that the Omicron variant may be immunologically resistant to antibody-mediated protection (Table 1) [9]. It is predicted that these changes may be related to the improvement of the ability of the virus to escape from the immune system, the increase in its replication capacity, and the increase in its contagiousness [7,10,11]. Studies have shown that the Delta variant has a lower affinity than the Omicron variant for binding to the host cell receptor, Angiotensin-converting enzyme 2 (ACE 2). This is a higher potential for Omicron variant transmission. It also shows that the Omicron variant has a more stable structure since the Delta variant has a lower percentage of alpha-helix structures than the Omicron variant [7,10,11].

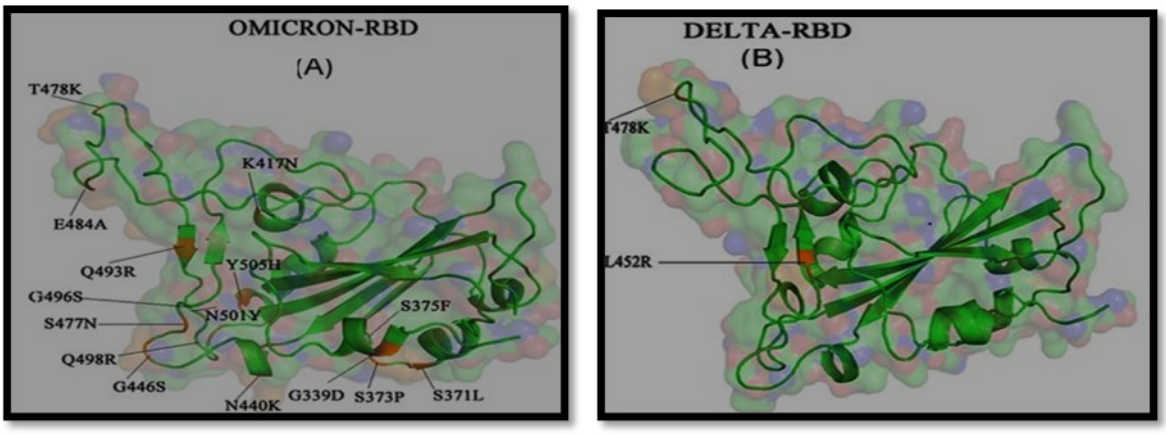

Figure 1: *Comparison of receptor binding Omicron (RBD) (A) Omicron and (B) Delta variant mutation (orange color) [4].*

Some mutations in the receptor-binding domain of the Omicron variant have been shared by other SARS-CoV-2 variants. These mutations consist of K417N, E484K, N501Y, D614G, and T478K. The K417N mutation (lysine to asparagine substitution) is shared by both Omicron and Beta variants. The E484A mutation in Omicron may be a major mutation present in the Beta and Gamma variants as E484K (Table 1). The E484K mutation can cause reinfection. N501Y was determined to have a stronger binding affinity to human Angiotensin-Converting Enzyme 2 (hACE2) as it is one of the contact residues in Comparison of receptor binding Omicron (RBD). The D614G mutation (substitution of aspartic acid to glycine) is found in the S1 subunit of the Omicron variant. The T478K mutation (threonine to lysine) found in Omicron is also located in the Delta variant [5,12,13].

Epidemiology of SARS-CoV-2 variants

As of January 16, 2022, more than 323 million confirmed cases and more than 5.5 million deaths have been reported worldwide. Despite slowing the increase in case incidence globally, all regions reported an increase in weekly case incidence except for the African Region, which reported a 27% decrease. The Southeast Asian Region reported the largest increase in new cases last week (145%), followed by the Eastern Mediterranean Region (68%), the Western Pacific Region (38%), the Americas Region (17%), and the European region (10%). New weekly deaths increased in the South-East Asia Region (12%) and the Americas Region (7%) while remaining similar to the figures reported in the previous week in other regions [14,15]. The current global epidemiology of SARS CoV-2 is characterized by the emergence of the Omicron variant, decreased prevalence of the Delta variant, and very low circulation of the Alpha, Beta, and Gamma variants. Following the detection of travel-related Omicron cases, countries that experienced a rapid increase in Omicron cases in November and December 2021 started to see decreases in cases. The Omicron variant includes Pango strains B.1.1.529, BA.1, BA.2, and BA.3. BA.1 accounts for >99% of the series submitted to the global initiative on sharing avian flu data (GISAID) as of 18 January 2022. All these variants are monitored by WHO under the umbrella of 'Omicron'. Of the 405 739 sequences uploaded to GISAID with samples collected in the last 30 days, 291 600 sequences (71.9%) Omicron, 113 652 (28%) Delta, 47 (<0.1%) Gamma, 10(<0.1%) Alpha, and 3 (<0.1%) consist of other circulating variants (including Mu and Lambda) [14,16].

Suggestions

Since it is known that all variants of the coronavirus can become so severe that people die, necessary precautions should also be taken against the Omicron variant. These measures are;

⇒ Organizing a vaccine solidarity campaign with communities all over the world,

⇒ Measures such as providing economic-social supports and general public health, ventilation of closed areas should be done as a whole and for the purpose of filtration.

⇒ FFP2-FFP3 and N95 type masks should be provided free of charge for those who have to be in a risky environment.

⇒ It is to give paid leave at least during the winter months for those who work in a risky environment and have diseases that increase the risk, such as immune deficiency.

⇒ The fact that people spend more time indoors with the cold weather paves the way for the spread of the virus. To prevent this situation, the mask should never be removed in crowded environments. In addition, paying attention to social distance, washing or disinfecting hands frequently also contributes to preventing the spread of the virus.

As of 2021, in addition to the development of some drugs (e.g., immunomodulators, monoclonal antibodies, remdesivir, molnupiravir, and others) against the Covid-19 virus, vaccines that appear to be effective against the virus have also been developed and are continuing. vaccines that appear to be effective against the virus have been developed and continue to be applied rapidly. Considering the world population approaching eight billion, although the vaccine figures seem promising, it is not possible to say that countries have equal opportunities in accessing the vaccine. In the example of the African continent, it is stated that as of September 2021, the 40% vaccination rate, which is considered important in the vaccination process, has reached only limited places [14]. Considering that the number of African Union member states, of which African states are members, is 55 in the fight against Covid-19, it can be said that there is serious backwardness in countries in the African continent in the case of vaccination [14]. One of the problematic developments in the fight against the Covid-19 virus, which poses a threat to international security, is that the related virus continues to spread in many countries of the world with its variants derived by transformation. The fact that the existing vaccines produced are not fully effective on Covid-19 variants may cause the vaccinated individuals to carry the variants together with the unvaccinated and continue to spread the disease. In this context, Covid-19 variants have reduced the preventiveness of the vaccination element, which is one of the most effective methods in combating the epidemic, and increased the threat level by causing the epidemic to spread again. In this context, the first examples are in the UK (18 November 2020, "alpha" variant), for the first time in South Africa ("beta" variant), Brazil (11 January 2021 "gamma" variant), and India. (April-May 2021 “delta” variant) is an example of this situation. The formation of new variants continues and these variants play a role in the continuation of the Covid-19 epidemic, which is a security threat. It has been noted that as of August 2021, the alpha variant has spread to more than 50 countries, the beta variant has been seen in at least 20 countries, and the gamma variant has spread to more than 10 countries [17]. The face of the current situation in the fight against the Covid-19 epidemic and the continued spread of variants of the virus, vaccine development, and fair distribution of the vaccine is undoubtedly seen as the most important issues. Drawing attention to this situation, WHO Director-General Tedros Adhanom Ghebreyesus affirmed the principle of indivisibility of safety, saying, "As long as inequality in vaccine distribution continues, the virus will continue to spread and change" [14 ,18,19].

Conclusion

The Covid-19 outbreak has created serious security risks and challenges across a wide range of dimensions, from individuals to societies, from states to the international system. In this context, the link between safety and health has been strengthened. Although there are examples of problematic interactions between states against the virus, it can be said that a trend towards international cooperation is observed, confirming the principle of indivisibility of security. In this context, it is seen that international interaction regarding the unique nature of the Covid-19 epidemic, as an international security threat, unique contribution to international cooperation and highlight the existing disruptions.

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