

Omicron Variant: The SARS-CoV-2 Genetic Variant of Concern

Venkataramana Kandi^{1*}, Kashif Momin², Nikhil Mudgalkar³

¹Department of Microbiology, Prathima Institute of Medical Sciences, Karimnagar, Telangana, India

²Department of Community Medicine, Prathima Institute of Medical Sciences, Karimnagar, Telangana, India

³Department of Anesthesiology, Prathima Institute of Medical Sciences, Karimnagar, Telangana, India

*Corresponding Author:

Venkataramana Kandi, Department of Microbiology, Prathima Institute of Medical Sciences, Karimnagar, Telangana, India

E-MAIL: ramana20021@gmail.com

Date of Submission: 15/12/2021

Date of Review: 26/12/2021

Date of Acceptance: 27/12/2021

The Coronavirus disease (COVID-19) caused by the novel Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) has been in existence since the last two years after its discovery in December 2019, in Wuhan, China [1]. The COVID-19 is continuing to cause severe morbidity and mortality throughout the world [2, 3]. The WHO has been evaluating the results of the safety and efficacy of vaccines that are currently under different stages of clinical development. More than 10 COVID-19 vaccines have been approved by the WHO for emergency use application (EUA) [3]. However, there is widespread hesitancy regarding the vaccine safety, and uncertainty on the efficacy of the available vaccines. Moreover, the vaccines that have been currently approved are undergoing the phase III clinical trials.

The SARS-CoV-2, after it was discovered had undergone several mutations and showed the occurrence of thousands of genetic lineages and virus variants spread across the globe [3]. The virus variants are classified as variants of concern, variants of interest and the variants under monitoring based on the transmissibility, severity of infection and other factors that include mutations [4]. The Delta variant (B.1.617.2) was noted to be the most notorious of all the genetic variants of the virus Table 1

There was a worldwide concern over the spread of Delta variant which resulted in the occurrence of wave after wave that affected the normal human lives throughout the world. Concerns were also raised over the effectiveness of the current vaccines on the Delta variant as reports of breakthrough infections are being increasingly observed. The breakthrough infections are the SARS-CoV-2 infections suffered by people even after completing the required doses of vaccination. Nevertheless, most breakthrough infections were mild in presentation and required no hospitalization.

As the world over was struggling to cope up with the spread of Delta variant, the South African scientists have discovered a new virus variant which was named as the Omicron (B.1.1.529) [5].

Based on the assessment of the Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE), the Omicron vari-

ant is designated as a Variant of Concern (VOC). A SARS-CoV-2 VOC is a variant associated with one or more of the changes at a degree of global public health significance that include increased transmissibility or detrimental change in COVID-19 epidemiology, elevated virulence or change in clinical disease presentation, and decrease in the effectiveness of public health and social measures or available diagnostics, vaccines, and therapeutics. [5] It was also noticed that the Omicron variant has demonstrated significant mutations on the spike protein, and elsewhere in other parts of the virus. Also, the recent developments from South Africa, and the United Kingdom indicate the predominance of this variant potentially replacing the Delta variant.

The Omicron variant has currently been reported from more than 89 countries throughout the world. From the available knowledge, the Omicron variant appears to have increased transmissibility, can potentially evade immune responses, and the current vaccines may not completely protect people against infection. Current evidence also suggest that the rates of re-infections could be more with Omicron variant as compared to the other dominant variants that include the Beta (B.1.351), and the Delta variants.

The incubation period (upto 14 days), and common presenting symptoms associated with the infection with the Omicron variant are not different from the symptoms during the Delta variant or infection with other viral variants.

The symptoms with Omicron variant noted until now included sore throat, tiredness, and cough. However, more young people were found to be infected with the Omicron variant, and most were mild and needed only 1-2 days of hospitalization.

Although data on the clinical severity of Omicron is limited, all cases reported till now have been mild or asymptomatic; but it remains unclear to what extent Omicron may be inherently less virulent. [6]

However, news of death due to infection with the Omicron variant has been emerging from the United Kingdom and the United States of America, which needs to be carefully evaluated further to implement stringent control measures in the public health perspective.

Name of the SARS-CoV-2 variant	Severity	Place/Year	Current Status
Beta (B.1.351), Gamma (P.1), Delta (B.1.617.2 and B.1.617.3), and Omicron (B.1.1.529)	Variant of concern	South Africa, Sep. 2020, Brazil Dec. 2020, India Dec. 2020, and South Africa and Botswana Nov.2021	Community transmission
Lambda (C.37), Mu (B.1.621), AY.4.2	Variant of Interest	Peru Dec. 2020, Columbia Jan.2021 and United Kingdom June 2021	Sporadic transmission and Community transmission
C.36+L452R, B.1.1.318, P.1+P681H, B.1.617.2+E484X, B.1.617.2+Q613H, B.1.617.2+Q677H, B.1.617.2+K417N, C.1.2, B.1.640	Under monitoring	Egypt Dec. 2020, India Apr. 2021, United Kingdom June 2021, South Africa Jun. 2021 and The Republic of Congo Sep. 2021	Sporadic transmission

Table 1: SARS-CoV-2 Variants

It is fortunate that routinely used PCR and antigen-based rapid diagnostic test (Ag-RDT) assays are adequate in detecting the virus, though some S gene targeting PCR assays could not detect the Omicron variant. And this S gene target failure (SGTF) can therefore be used as a useful proxy marker for surveillance purposes. However, sequencing is required for confirmation as this deletion can also be found in other VOCs (e.g., Alpha and subsets of Gamma and Delta).^[6]

The current vaccines may still be useful in protecting people against severity of COVID-19. The necessity of a booster dose and its importance in preventing severe COVID-19 has been in debate ever since the emergence of the Omicron variant. The UK and the USA have already started giving booster shots of the vaccines. However, nations throughout the world should continue to be on alert by increasing the surveillance, diagnosis, genomic sequencing, and controlling the spread of the Omicron variant.

Further studies with special reference to the Omicron variants transmissibility, clinical course and virulence, and the usefulness of the diagnostic methods, vaccines and therapeutic drugs are required to plan effective strategies to control the spread of infection.

REFERENCES

1. Pal M, Berhanu G, Desalegn C, Kandi V. Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2): An Update. *Cureus*. 2020;12(3):7423–7423. Available from: [10.7759/cureus.7423](https://doi.org/10.7759/cureus.7423).

2. Disease KVC. COVID-19/SARS-CoV-2: Hopefully, the Human-Virus Battle Ends Soon on a Positive Note. *Perspectives in Medical Research*. 2020;8(1):1–3.
3. Pal M, Gemechu B, Kerorsa V, Kandi. A Knowledge Update on SARS-Coronavirus-2 (SARS-CoV-2)/COVID-19 and Its Global Public Health Implications. *American Journal of Clinical Medicine Research*. 2020;8(1):23–27.
4. SARS-CoV-2 variants of concern as of 22 December 2021 ; 2021,. Available from: <https://www.ecdc.europa.eu/en/covid-19/variants-concern>.
5. Classification of Omicron (B.1.1.529): SARS-CoV-2 Variant of Concern ; 2021,. Available from: [https://www.who.int/news/item/26-11-2021-classification-of-omicron-\(b.1.1.529\)-sars-cov-2-variant-of-concern](https://www.who.int/news/item/26-11-2021-classification-of-omicron-(b.1.1.529)-sars-cov-2-variant-of-concern).
6. Enhancing Readiness for Omicron (B.1.1.529): Technical Brief and Priority Actions for Member States ; 2021,. Available from: [https://www.who.int/publications/m/item/enhancing-readiness-for-omicron-\(b.1.1.529\)-technical-brief-and-priority-actions-for-member-states](https://www.who.int/publications/m/item/enhancing-readiness-for-omicron-(b.1.1.529)-technical-brief-and-priority-actions-for-member-states).

How to cite this article: Kandi V, Momin K, Mudgalkar N. **Omicron Variant: The SARS-CoV-2 Genetic Variant of Concern.** *Perspectives in Medical Research*. 2021;9(3):1-2
DOI: [10.47799/pimr.0903.01](https://doi.org/10.47799/pimr.0903.01)