



DELTA AND THE DELTA PLUS VARIANTS OF CORONAVIRUS DISEASE 2019 (COVID-19) OF INDIA

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ARTICLE INFO

Article History:

Received 13th July, 2021

Received in revised form 11th August, 2021

Accepted 8th September, 2021

Published online 28th October, 2021

Key words:

Coronavirus, variant, delta, delta plus, vaccine

ABSTRACT

Earlier coronavirus has infected humans in 2002 and 2012 as SARs-CoV (severe acute respiratory syndrome coronavirus) and MERS-CoV (Middle East respiratory syndrome coronavirus) respectively. In 2019 the novel coronavirus emerged as SARS-CoV-2 creating a pandemic which prevailed even today. This novel virus has known to panic the entire human population as it took the lives of millions around the world. Vaccine to the virus has been developed but this virus keeps on mutating giving rise to new variants which is challenging for the existing vaccine. In India, delta variant of coronavirus was responsible for the second wave which prevailed from April 2021. Another sub-lineage of delta variant called the delta plus variant recently identified in the country is a matter of concern and cannot be taken lightly as this could initiate a 3rd wave in the country. So safety precautions such as wearing mask, social distancing, sanitizing etc are to be followed strictly for everyone's safe and healthy future.

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INTRODUCTION

The novel coronavirus (severe acute respiratory syndrome coronavirus-2 i.e; SARS-CoV-2) was first detected in the Wuhan city, China on December 2019. It is a beta coronavirus with genetic similarity with that of SARS-CoV (70%) and bat coronavirus (96%). Coronaviruses are single stranded RNA viruses which mutate rapidly leading to novel CoVs and can transmit from living creatures to *Homo sapiens*^{1,3}.

Earlier novel severe acute respiratory syndrome coronavirus (SARS-CoV) emerged in 2002 while MERS-CoV i.e, Middle East respiratory syndrome coronavirus emerged in 2012 and in 2019 till date, the novel (SARS-CoV-2) i.e COVID-19 is creating pandemic taking the lives of millions around the globe¹⁴. CoVs are classified into- Alpha(Pango lineage ,B.1.1.7; 1st detected: United Kingdom), beta (lineage, B.1.351; 1st detected South Africa), gamma (lineage P.1 ; 1st detected Brazil) and delta (lineage B.1.617.2; 1st detected India) coronaviruses. Alpha and beta are found in mammals such as *Homo sapiens*, bats (order :*Chiroptera*), rodents (order: *Rodentia*) while gamma and delta are found mostly in avian species^{2,11}.

VOC and VOI of coronavirus

World Health Organisation (WHO) recommends each variant as either- variant of concern (VOC) or variant of interest (VOI). VOC is a variant which transmits very fast with decreased vaccine efficiency and increased mortality. SARs CoV-2 VOC are- alpha, beta, gamma and delta.VOI has genetic capability to change virus characters such as severity of disease, evade diagnosis thus increasing virus infections leading to community transmission. SARS CoV-2 VOI are- Eta (lineage, B.1.525, 1st detected in Nigeria, December 2020), Iota (lineage B.1.526, 1st detected in USA, Dec 2020), Kappa (lineage B.1.617.1, double mutant virus reported in Uttar Pradesh, India, 1st detected in October 2020) and Lambda (lineage C.37, 1st detected in Peru 2020, found to be resistant to mRNA covid 19 vaccines of Canada viz; Pfizer-Bio Ntech and Moderna)⁴.

Delta and the delta plus variant

Delta variant (lineage B.1.617.2) of SARS CoV-2 which was first detected in India on December 2020, played a major role in the devastating India's second wave of coronavirus infections after March 2021 with India recording 4,00,000 cases per day on May 2021. It later spread to around 85 countries and in U.K, it become the dominant strain¹⁰. As of Johns Hopkins data, India has recorded second highest covid cases in the world after United States with 31.2 million cases with fatalities of around 4,19,000⁷.

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Unlike the first wave of coronavirus pandemic where older persons are infected, in second wave the younger populations including children are also infected apart from older ones. Children have mild clinical symptoms than adult and thus may escape testing positive for the virus. Thus asymptomatic children might act as the carrier of the disease but the disease transmission from children remains uncertain^{2,11}. The symptoms of the delta variant include gastrointestinal trouble apart from respiratory, fever, cough, headache, body ache, sore throat of SARS-CoV2 virus⁹. Sub variant of Delta variant also detected in December 2020 and is called the “Indian double mutant “with lineage B.1.617.1. It has two mutations in the virus spike protein namely L452R and E₄ 8₄Q mutation. A third mutation called V₃82L in spike protein also detected in some B.1.617.1 viruses and is called as “triple mutant”⁸.

Another new variant of the Delta variant called the “Delta Plus variant” lineage AY.1 declared as VOC by the Indian government as it has already created havoc across the globe with increased transmission and drug resistance. This new strain has been identified in 12 Indian states with Maharashtra bearing the highest of the cases. The transmission rate of this variant (with mutations L452R and P871R) is 60% faster than the delta variant and binds more easily to lung tissue. Some of the symptoms of the delta plus variant are- fever, headache, cough, diarrhoea, chest pain, difficulty in breathing, stomach ache, nausea, anorexia⁵.

Delta plus variant (A.Y.1) has a K417N mutation in the spike protein carried by A.Y.2 (delta variant) and Beta variant (B.1.351, first reported in South Africa). As such the characteristics of both these variants i.e, high transmission ability and escaping immune response respectively may be shown by this new variant 6.

CONCLUSION

Coronavirus (SARS-CoV-2) should not be taken lightly even when the cases are low in the country and hence every precautions such as wearing mask, social distancing, sanitizing etc are to be followed as per government SOP (standard operating procedure) so that this particular Delta plus variant does not become the dominant variant for ensuing the third wave of the country and further loss of human kind. Moreover, fast vaccination drive for the entire population is the need of the hour to prevent further mutants of the virus to evolve and ravage the future times. Also the much awaited vaccination drive of adolescents and children has also to be considered for the entire pandemic to be over.

Conflict of interest: The authors declare that they have no conflict of interest.

Acknowledgement: The authors acknowledge Director, Centre for Studies in Biotechnology, Dibrugarh University for help, guidance and constant encouragement.

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How to cite this article:

Shaheen Shah and RNS Yadav (2021) ‘Delta And The Delta Plus Variants Of Coronavirus Disease 2019 (Covid-19) Of India’, *International Journal of Current Advanced Research*, 10(10), pp. 25351-25352. DOI: <http://dx.doi.org/10.24327/ijcar.2021.25352.5062>
