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A Comprehensive Review on Covid-19 Delta variant

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ABSTRACT

The Delta variant is a variant of SARS-CoV-2, which was the main reason behind the severity of the second wave in India. This variant had increased transmissibility and more severe infections. Currently, the Delta variant has dominated the number of infections all over the world. In England, as of June 14, there were 33,630 cases of delta variants in a weekCoronavirus, like all the other kinds of viruses, keeps mutating a process in which genetic information of the virus changes because of repeated copying errors. These mutations result in new variants, some of which can spread more easily, or cause more severe symptoms of covid-19 disease and a higher fatality rate.

Key Words: Covid 19, Delta Variant, Delta plus

INTRODUCTION

The head of the World Health Organization stated that the Covid-19 delta variant first seen in India, is the most transmissible of the variants identified so far and warned it is now spreading in at least 85 countries(1).The Delta variant is a highly contagious variant of COVID-19.Health authorities are particularly concerned by it because it appears to bemore infectious than other variants, more resistant to health controls and preventions such as isolation, causing more varied and severe symptoms among patients, spreading more easily among children.The Delta variant is also known as B.1.617.2 and was previously known as the Indian variant.(2)

Symptoms

Anyone with symptoms of COVID-19 should get a COVID-19 test, even if the symptoms are mild.Further testing is required to determine which type of variant a person has once they have tested positive to COVID-19.Symptoms usually appear five to six days after a person has been infected with COVID-19, however symptoms may appear between two and 14 days after exposure. (2)

Public Health England

New study by PHE shows for the first time that 2 doses of the COVID-19 vaccines are highly effective against the B.1.617.2 variant first identified in India.Vaccine effectiveness against symptomatic disease from the

B.1.617.2 variant is similar after 2 doses compared to the B.1.1.7 (Kent) variant dominant in the UK, and we expect to see even higher levels of effectiveness against hospitalisation and death.

The study found that, for the period from 5 April to 16 May:

- The Pfizer-BioNTech vaccine was 88% effective against symptomatic disease from the B.1.617.2 variant 2 weeks after the second dose, compared to 93% effectiveness against the B.1.1.7 variant
- 2 doses of the AstraZeneca vaccine were 60% effective against symptomatic disease from the B.1.617.2 variant compared to 66% effectiveness against the B.1.1.7 variant
- Both vaccines were 33% effective against symptomatic disease from B.1.617.2, 3 weeks after the first dose compared to around 50% effectiveness against the B.1.1.7 variant

The analysis included data for all age groups from 5 April to cover the period since the B.1.617.2 variant emerged. It included 1,054 people confirmed as having the B.1.617.2 variant through genomic sequencing, including participants of several ethnicities. Data published on Thursday 20 May for vaccine effectiveness covered the period since December for those aged over 65.The difference in effectiveness between the vaccines after 2 doses may be explained by the fact that rollout of second doses of AstraZeneca was later than for the Pfizer-BioNTech vaccine, and other data on antibody profiles show it takes longer to reach maximum effectiveness with the AstraZeneca vaccine.As with other variants, even higher levels of effectiveness are expected against hospitalisation and death. There are currently insufficient cases and follow-up periods to estimate vaccine effectiveness against severe outcomes from the B.1.617.2 variant. PHE will continue to evaluate this over the coming weeks (3)

Global Studies

Delta has been reported in 80 countries. It is now the most common variant in India and Britain, where it accounts for more than 90% of cases.Delta was first identified in the United States in March. Although Alpha remains the most prevalent variant here, Delta has spread quickly. In early April, Delta represented just 0.1% of cases in the United States, according to the CDC. By early May, Delta accounted for 1.3% of cases, and by early June, that figure had jumped to 9.5%. A few days ago, the estimate reached 20.6 %.(4)

The SARS-CoV-2 variant of concern B.1.617.2 displaced B.1.1.7 as the dominant variant in England and other countries. The study also conducted to determine whether B.1.617.2 was also displacing B.1.1.7 in the United States. Analyzed PCR testing results and viral sequencing results of samples collected across the United States, and showed that B.1.1.7 was rapidly being displaced and is no longer responsible for the majority of new cases. The percentage of SARS-CoV-2 positive cases that are B.1.1.7 dropped from 70% in April 2021 to 42% in just 6 weeks. The analysis showed rapid growth of variants B.1.617.2 and P.1 as the primary drivers for this displacement. Currently, the growth rate of B.1.617.2 was higher than P.1 in the US (0.61 vs. 0.22), which is consistent with reports from other countries. Lastly, reports showed that B.1.617.2 was growing faster in counties with a lower vaccination rate. (5-9)

Delta variant

When Covid-19 infections broke out in Wuhan, China, that first strain was a “wild type” virus. This was the strain used by scientists across the world to develop testing kits, treatment plans, and even vaccines. It is in the nature of viruses to mutate, and it did. But not all mutations are serious, and usually do not require countries to reimagine their public health measures. The variants of concern—Alpha (first identified in the UK), Beta (South Africa), Gamma (Brazil) and Delta—are different from all other countless variants for this very reason. The Delta variant has certain significant mutations in the spike protein of the virus—the pointy elements that give it the shape of a crown (which is why it’s called the *corona*virus). These spikes are like hooks that have to find the receptors in a human cell to link with. Studies have shown that these spikes hook onto receptors called ACE-2. Once these spike proteins can unlock the cells, the infection spreads by replicating the genetic code of the virus. Some key mutations in the Delta variant—such as the E484Q, L452R, and P614R—make it easier for the spikes in the virus to attach to ACE-2 receptors. This means it can infect and replicate faster, and even evade the body’s natural disease-fighting immunity more efficiently. The spike protein mutations make the Delta variant the “fastest and fittest” variant yet, according to the WHO. The disease caused by this variant might also exhibit different symptoms than other viral mutations. Those with the Delta variant often complain of headaches, sore throat, and a runny nose, replacing cough and loss of taste of smell as the most common symptoms. (10)

Delta, formerly known as B.1.617.2, is believed to be the most transmissible variant yet, spreading more easily than both the original strain of the virus and the Alpha variant first identified in Britain. Public health officials there have said that Delta could be 50% more contagious than Alpha, although estimates of its infectiousness vary.Other evidence suggests that the variant may partially evade the antibodies made by the body after a coronavirus infection or vaccination. And the variant may render certain monoclonal antibody treatments less effective, the CDC notes.Delta may also cause more severe illness. A recent Scottish study, for instance, found that people infected by the Delta variant were roughly twice as likely to be hospitalized as those infected with Alpha. (4)

Delta plus Variant

As Delta Plus (B.1.617.2.1/ (AY.1) is a variant of Delta, it is also treated as a variant of concern. But the properties of the variant detected in India (AY.1) are still being investigated. According to India's Covid genome sequencing consortium, AY.1 cases have mostly reported from nine countries of Europe, Asia and America.The two is differentiated by the K417N mutation in Spike protein which Delta Plus variants have.While Delta was first reported in India, Delta plus first reported by Public Health England on its June 11 bulletin. It said that the new variant was present in six genomes from India as of June 7. (11)

CONCLUSION

Delta variant of coronavirus has been held responsible for the second wave of the pandemic in India.Based on what is known so far, Delta Plus is considered highly infectious. There is rising concern in some quarters following warnings by experts that Delta Plus may show resistance against monoclonal antibodies cocktail treatments. One potential risk that has sparked unease among the medical community is that the new variant may be able to bypass immunity provided by both vaccine and earlier infection. IndianExperts stated that Delta Plus, already detected in India and it can be the reason behind the third wave.

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