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Review Article

Delta Variant: Disastrous Covid Variant in India

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Abstract

Delta variant is a variant of concern that WHO is tracking and monitoring around the world. It's a variant of concern because we know it has increased transmissibility. This has been demonstrated by several countries. And we know that where the Delta variant is identified, it really rapidly takes off and spreads between people more efficiently than even the Alpha variant that was first detected around December, January 2021. This review highlights the emergence of Delta variant among Indian populations.

Keywords: COVID; SARS-COV2; DELTA variant; Novel strains.

INTRODUCTION

In 2020, March 11th, the World Health Organization revealed pandemic the coronavirus disease i.e. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). This SARS virus is originated in bats but it started involving in animals so it's not limited for its bats origin [1]. The infection of covid-19 is seen in a number of animals in all over the world that includes dogs, cats, zoo animals and all living things through human to animal transmission [2, 3]. In case of animals, there is no evidence about transmission from animals to humans, but pet animals we often consider as a family member. So the activities of pet animals like jumping on kitchen, sleeping on the bed, some wounds it can be reason of transmission [4]. Recent research stated that new strains of SARS-CoV-2 has rapidly spreading in all over the world. This research studies, reveals that there are so many mutations are occurred in virus gene and it becomes very big threat to both humans and animals health. That mutational changes are occurred on mostly spike proteins. And on the basis of that evidence, variant strains have been found and among from four Alpha, Beta and Gamma SARS-CoV-2 Delta variant is one of the highly transmissible and widely spreading in 85 countries [5]. It seems to be more infectious than other variants and extreme dreadful symptoms in patients mostly among children. This Delta variant previously familiar with Indian variant and known as B.1.617.2. Delta variant has been found in many countries but primarily in the Indian state of Maharashtra and other regions [6]. Recent reports stipulated that B.1.617.2 variant shows a less sensitivity to the monoclonal and polyclonal antibodies compared to the rest of three Alpha, Beta and Gamma [7].

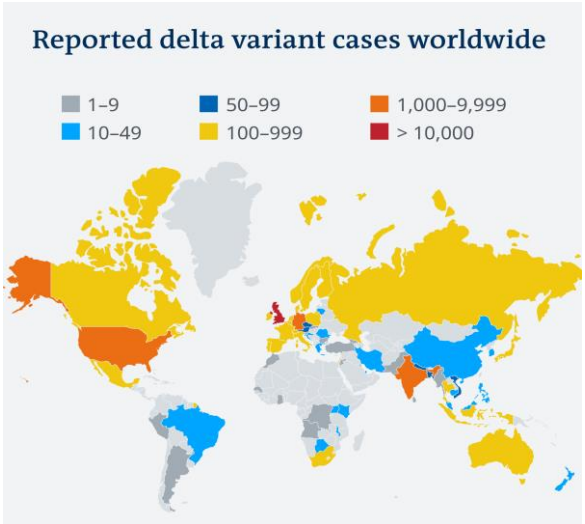

Fig 1

Worldwide studies on Delta variant

Delta variant has been detected in 80 countries and it is now the most common variant in India and Britain. In UK, early stage 0.1% of cases of Delta, later in early May and June it is accounted for 1.3 and 9.5% of cases. And few weeks ago, it is reached almost

20.6% [8]. In Fig 1 the overall studies have been done through statistical data where it indicates that how many cases reported till month June. In United States and India, cases have been reported near to 10,000 including Germany. In UK, it is greater than 10,000 cases. Russia, Australia, Mexico and Canada all have been reported with around near to 1000 cases. In China, Brazil and Iran, cases of delta variant seems very less as compared to others countries. Less cases of delta has been reported in South Africa, Argentina and Denmark. About India it is totally covered all regional states of India with highly infection.

Delta Variant

When outbreak of covid-19 virus first time found in Wuhan, China that time it was a wild type of virus. And that virus strain has been used by scientist of all over the world to make vaccines and testing kits. Because of mutation a new SARS-Covid_19 strain came out. This Delta variant has undergone some mutational changes in spike proteins. These spike proteins are structurally looks like hook that helps to bind receptor of host cell called Angiotensin-converting enzyme 2 i.e. ACE-2. Once these spike proteins bind to the host cell receptors they open the cell and release their genetic material inside to replicate gene. Mutations such as some modifications on spike proteins genes E484Q, L425R and P614R that easily helps to virus to attach with ACE-2 receptors. According to WHO, this spike proteins modifications allow virus to replicate faster and infect to the host with symptoms such as headache, sore throat, runny nose with cough and loss of taste [10].

Why we are considering Delta variant as a major concern?

Recently a Delta variant is recognized as Delta plus which has K417N mutation on spike protein. This variant has less infection cases but in India it has been reported new cases in different states so it is now very dangerous concern in India for third wave according to future perspectives. In USA, Canada, United Kingdom, Russia and Japan Delta plus slowly coming out. The Central Drugs Standard Control Organization (CDSCO), they officially accepted that treatment of covid-19 by using the combination of two monoclonal antibodies Casirivimab and Imdevimab are going to resist by Delta plus variant but still plasma from people who have been vaccinated need to be tested whether any significant take away from body immunological responses. According to some scientific studies, it is suggested that comparatively delta plus has higher affinity to the mucosal layer in the lungs.

The mutation occurred on spike protein, it is critical when it interacts with receptor protein ACE2. ACE2 helps the virus to enter in different body organs such as lungs, heart, kidney and intestinal parts for infection. Some conformational changes happen when spike protein comes in contact with ACE2 which is open and closed system to enter in host cell and that helps to increase the ability to attach and infect the cell [11].

Is it symptomatically same like Wild type SARS-Covid-19?

As usual infection spreads through contacts like suffered person when come in contact with healthy person by coughing, sneezing, sometimes oral contacts that passes pathogens into the respiratory system through inhalation via nose and mouth. About the symptoms, it has common symptoms such as common cold, fever, sore throat, loss of taste or smell, diarrhea to critical pneumonia and that leads the death of person. Right now vaccination is working nicely to reduce covid-19 cases and therefore Indian Government has kept lockdown to change curve of positive cases. Indian Council of Medical Research has been reported that after doing survey about Indian vaccinated population, only 21% had antibodies against SARS-CoV-2. And therefore India is far away from herd immunity which helps to form protection against infectious diseases [12].

Covid-19 Tracker in India assumes about second wave

The Government of India is reporting about the cases of covid-19 as per on daily basis. The day by day across the India covid-19 samples are testing at particular regional labs. People are also doing vaccination simultaneously. If you see the overall data total 56,06,52,030 vaccination done, 49,84,27,083 samples tested and 97.52% people discharged from the hospitals. About death rate, it is about 1.34%.

https://www.mygov.in/covid-19

STATE/UTS	TOTAL CASES	ACTIVE	DISCHARGED	DEATHS	ACTIVE RATIO	DISCHARGE RATIO	DEATH RATIO
Maharashtra	64,01,213 ↑ 4,408	64,790 ↓ 1,132	62,01,168 ↑ 5,424	1,35,255 ↑ 116	1.01%	96.87%	2.11%
Kerala	37,24,030 ↑ 21,613	1,75,695 ↑ 2,930	35,29,465 ↑ 18,556	18,870 ↑ 127	4.72%	94.78%	0.51%
Karnataka	29,31,827 ↑ 1,298	21,507 ↓ 567	28,73,281 ↑ 1,833	37,039 ↑ 32	0.73%	98.00%	1.26%
Tamil Nadu	25,92,436 ↑ 1,804	20,225 ↓ 145	25,37,632 ↑ 1,917	34,579 ↑ 32	0.78%	97.89%	1.33%
Andhra Pradesh	19,95,669 ↑ 1,063	16,341 ↓ 877	19,65,657 ↑ 1,929	13,671 ↑ 11	0.82%	98.50%	0.69%
Uttar Pradesh	17,08,991 ↑ 26	420 ↑ 1	16,85,785 ↑ 24	22,786 ↑ 1	0.02%	98.64%	1.33%
West Bengal	15,39,612 ↑ 547	9,736 ↓ 96	15,11,558 ↑ 637	18,318 ↑ 6	0.63%	98.18%	1.19%
Delhi	14,37,156 ↑ 38	471 ↑ 4	14,11,612 ↑ 30	25,073 ↑ 4	0.03%	98.22%	1.74%
Chhattisgarh	10,03,870 ↑ 56	1,037 ↓ 101	9,89,284 ↑ 156	13,549 ↑ 1	0.10%	98.55%	1.35%
Odisha	9,96,153 ↑ 720	8,661 ↓ 412	9,80,471 ↑ 1,064	7,021 ↑ 68	0.87%	98.43%	0.70%
Rajasthan	9,53,960 ↑ 6	163 ↓ 17	9,44,843 ↑ 23	8,954	0.02%	99.04%	0.94%
Gujarat	8,25,213 ↑ 17	179 ↓ 5	8,14,956 ↑ 22	10,078	0.02%	98.76%	1.22%
Madhya Pradesh	7,92,054 ↑ 11	95 ↑ 1	7,81,444 ↑ 10	10,515	0.01%	98.66%	1.33%

https://www.mygov.in/covid-19

Above data has been reported till 18th Aug 2021 which shows that comparatively the Indian State of Maharashtra having a large number of covid-19 cases. The death ratio of Kerala is less than other above states but the active ratio of this state is showing cases are increasing day by day. About deaths occurs on daily basis Odisha having less death cases and in Madhya Pradesh, active ratio is about only 0.01% [13].

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