

Variants of the COVID Virus before the Onset of Omicron

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How to cite this article: Aanchal Anand, Ukshan Shah, Samar Hossain. Variants of the COVID Virus before the Onset of Omicron. *Indian Journal of Forensic Medicine and Toxicology* 2022;16(4).

Abstract

COVID-19 belongs to a group of Coronavirus diseases that SARS-CoV-2 causes. The virus spreads from one person to another via the respiratory droplets from an infected individual produced when such an individual coughs, talks, or sneezes. The symptoms of the diseases range from mild to severe, and individuals at age extremities, that are, very old (from 65 years of age), are highly exposed to severe complications. The symptoms manifest from the second day, fourteen days after exposure to the virus. COVID strains keep on changing as a result of mutations in the viral genomic composition. Different variants of COVID-19 exist; these variants vary in severity, as reported by the World Health Organization. There are thousands of variants of COVID in the world; the virus mutates all the time, making the changes inconsequential. Some of the mutations make the virus more infectious, and some mutated viral strains tend to be dominant. Variants of concern include those that have the most potentially concerning changes. India is among the nations where the virus strains have been reported to dominate and spread to other nations. The virus is claiming the lives of many individuals, with every strain spreading from one country to another. The article will address the research review on types of COVID variants and COVID-19 epidemiology in the world.

Keywords: Variants, Pandemic, epidemiology

Introduction

Different strains of concern are reported across the world. These strains tend to spread from one country to another, claiming many lives. These strains mutate; those of concern are under the closest monitoring to ensure that the health of individuals is protected from the viral strains. ¹Such variants of concern across the world include the following: India or the Delta variant. This strain was first reported in India and is also referred to as the B.1.617.2. According

to, the strain has spread to other countries in the world⁵. According to the WHO, Delta variant cases are reported in the UK in about 75000 cases⁶. This strain is reported to have mutations in the gene that encodes the SAR-CoV-2 spike protein – mutations in the gene result in substitutions in T478K, P681R, and L452R.

The UK, Alpha, or the Kent variant is another strain reported in the United Kingdom. It is also referred to as the B.1.1.7, and it is reported to be

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prevalent in Britain, with more than 200 000 cases reported.⁶ This strain has been shown to undergo mutations and has spread to more than 50 countries globally. According to the research conducted by the CDC in London, it was found out that this variant was 40%-90% easily transmissible than the pre-existing strains in the UK.³

South Africa or Beta variant, also called the B.1.135, was first identified in South Africa and is reported to have been spread to about 20 more countries with the United Kingdom included. The prevalence of this strain is reported to be higher among the younger population with no underlying health condition.³ The strain causes serious complications compared to other strains; it spread faster than other strains reported by the South African health department.

Brazil or the Gamma variant was first detected in Japan by the National Institute of Infectious Disease. It was identified among individuals who had traveled from Brazil, and it is reported to have been spread to about ten more countries with the UK included.⁵ The variant is also referred to as lineage P1. It results from genetic mutations in which amino acids in the genomic composition are substituted in the spike protein.

Epidemiology

The Gamma, the Alpha, the Beta, and the Delta variants are reported to spread globally and claim large numbers of lives in different countries. Characterization of the epidemiological characteristics of these variants is essential as it supports the public in health planning and the development of an inference system that can estimate different variations in transmission and immune escape of every strain of the virus.⁵ The B.1.1.7 variant is reported to have a 46.6% increase in its transmissibility, B.1.351 has a 32.4% increase in its transmissibility with a 61.3% immune escape, and P.1 has a 43.3% increase in the transmissibility and 52.5% immune escape.³ According to the model simulation, variants B.1.351 and P.1 are likely to supplant B.1.1.7 dominate and increase infections.

Geographical distribution and case count- Globally, COVID 19 cases have been reported to be over 150 million, according to the WHO and European

CDC.² With the first case reported in Wuhan City in China, the disease has spread globally, and many individuals have lost their lives to the disease, and the transmission is mainly through person-to-person. Transmissions of the disease are highest in household and congregate settings, with frequent cases reported in social or work gatherings.

The Problem Statement

The global overview- according to WHO, the numbers of new COVID-19 cases and deaths have shown a slight decrease; however, the case and the death incidence is still high since beginning of the pandemic. Weekly cases have decreased in Eastern Mediterranean and European regions, with the South East Asia region recording an increase in the number of newly affected cases. The death incidence has also risen in South East Asia and the Western Pacific regions. India has an upward trajectory in the number of new cases and deaths, with a 95% of cases and 93% deaths. India accounts for 50% of the total cases globally, and 30% of the total deaths reported globally. Currently, the delta strain in India is the major variant causing a rise in the number of individuals contacting the infection. Outside India, in the UK, the highest numbers of reported cases are sequenced as B.1.617.2 variant. According to the WHO world statistics updates, the number of cases per million people on June 29, 2021, was reported as follows: the United Kingdom 260.07, United States 37.50, India 29.83, Canada 16.83, Japan 11.83, and Germany 6.98. In India, the total number of COVID 19 cases since the first case include 30,362,848, with deaths accounting for 398484, as updated on June 30, 2021.⁷

Different measures have been put in place globally to reduce the rise in the number of cases of COVID 19 infections. These measures include the use of pre and post-exposure prophylaxis measures where approaches other than vaccination are under investigation to prevent and control of COVID 19 infection. Infection control measures in healthcare settings have been put in place to prevent community transmission of the infection, personal preventive measures such as wearing of face masks in the community, the practice of social distancing, and quarantine of individuals suspected to have the virus.⁴

There are general measures recommended to prevent the transmission of COVID infection, including diligent hand washing using the hand sanitizer with at least 60% alcohol. Respiratory hygiene measures include covering the mouth while sneezing or coughing, avoiding touching the face, nose, eyes, and mouth as recommended by the American Academy of Ophthalmology. Cleaning and disinfection of objects and surfaces are frequently touched, especially in the public and home setting, as recommended by the United States Centre for Disease Control and Prevention.² Adequate ventilation of the indoor spaces is also among the recommended measures to prevent the spread of the infection. These measures should be practiced by all individuals, including where there is a risk of community transmission of the SARS-CoV-2.

Source of funding: Not Required

Conflict of Interest: None

Ethical Clearance: Taken from the committee

References

1. Darby AC, Hiscox JA. Covid-19: variants and vaccination. <https://www.bmj.com/content/372/bmj.n771.full>
2. Eurosurveillance Editorial Team. Updated rapid risk assessment from ECDC on the outbreak of COVID-19: increased transmission globally. *Eurosurveillance*. 2020 Mar 5;25(9):2003051.
3. Fauci AS, Lane HC, Redfield RR. Covid-19 – navigating the uncharted. 2020 p.1268-1269 <https://www.nejm.org/doi/full/10.1056/nejme2002387>.
4. Girum T, Lentiro K, Geremew M, Migora B, Shewamare S. Global strategies and effectiveness for COVID-19 prevention through contact tracing, screening, quarantine, and isolation: a systematic review. *Tropical medicine and health*. 2020 Dec;48(1):1-5. <https://tropmedhealth.biomedcentral.com/articles/10.1186/s41182-020-00285-w>.
5. Hitchings MD, Ranzani OT, Torres MS, de Oliveira SB, Almiron M, Said R, Borg R, Schulz WL, de Oliveira RD, da Silva PV, de Castro DB. Effectiveness of CoronaVac among healthcare workers in the setting of high SARS-CoV-2 Gamma variant transmission in Manaus, Brazil: A test-negative case-control study. *medRxiv*. 2021 Jan 1.
6. Torjesen I. Covid-19: Delta variant is now UK's most dominant strain and spreading through schools. <https://www.bmj.com/content/373/bmj.n1445.full>.
7. World Health Organization. COVID-19 weekly epidemiological update. <https://apps.who.int/iris/bitstream/handle/10665/336478/nCoV-weekly-sitrep01Nov20-eng.pdf>.
8. Yang W, Shaman J. COVID-19 pandemic dynamics in India and impact of the SARS-CoV-2 Delta (B. 1.617. 2) variant. *medRxiv*. 2021 Jan 1. <https://www.medrxiv.org/content/10.1101/2021.06.21.21259268v1>.