EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 8
Issue: 8
256-258
Year: 2021

CORONAVIRUS AND IT'S DIFFERENT VARIANTS

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Article Received on 16/06/2021 **Article Revised on 06/07/2021** **Article Accepted on 27/07/2021**

ABSTACT
Viruses constantly change through mutation and the new variants of virus are expected to occur. Sometimes new variants emerge and disappear. Sometimes they persist. There is a need to constantly monitor the changes including the changes to the spikes on the surface of the virus. Some variants allow the virus to spread more easily or make it resistant to treatment of vaccines. The scope of the study on virus variants includes the scope of spread, the level of the infection caused and the test mechanisms to check and control the damage. The rapid and ever changing nature of the virus has made this task further more challenging and important in terms of saving the human lives.

KEYWORDS: Coronavirus, different variants, different mutations.

INTRODUCTION

Viruses are always changing and that can cause a new variant or strain of virus. A variant usually doesn't affect how the virus works but sometimes they make it act in different ways. Scientists around the world are tracking changes in the virus that cause covid 19. Coronavirus didn't pop up recently. They are a large family of viruses that have been around for quite long time. Many of them can cause variety of illness resulting from a mild cough to severe respiratory problems.[1]

The novel coronavirus that cause covid 19 is one of several known forms to infect humans. It is probably been around for sometime in animals. Scientists have done the grouping of coronavirus in the following manner-
229 E (alpha)
NL63 (alpha)
OC43 (beta)
HKU1 (beta)

MERS-COV[2] is a beta virus that causes middle level respiratory syndrome.
SARS COV[3] is a beta virus that causes severe acute respiratory syndrome.
SARS COV 2 is a virus that causes Covid 19.

Coronaviruses have their genetic material in something called RNA. When viruses infect they attach to the body cells and get inside them and make copies of RNA. In case there is copying mistake, the RNA get changed and it is called mutation. Such changes happen randomly and by accident and since these changes are random, they make little to no difference in a person's health.

In January 2021 experts spotted a new covid 19 variant in the people belonging to Brazil and who had travelled to Japan. By the end of that month the variant was found in some parts of United States. Other variants of the virus have been found in other countries including South Africa and Nigeria.

COVID-19 VARIANTS IN INDIA

There are some Coronavirus strains found in India which are responsible for most Covid-19 cases and several others that are locally concentrated and region-specific variants.

a) **COVID-19 BRAZIL VARIANT** – formally known as the "B.1.1.28" variant[4]: This Covid-19 variant is said to have originated in Brazil and is reportedly responsible for the 1.4 crores cases and over 3.5 lakh deaths due to the Coronavirus in the South American country. India has seen a fair share of the Brazilian Coronavirus strain cases.

b) **COVID-19 SOUTH AFRICA VARIANT** – formally known as the "B.1.351" variant[5]: Over 15 lakh people have been affected by the outbreak of this variant in South Africa and over 50,000 lives have been lost in the African continent due to it. Few cases of the South African Coronavirus strain have been reported in India as well.

c) **COVID-19 UK VARIANT –** formally known as the "B.1.1.7" variant[6]: Seen in large number of cases in and around Delhi and Punjab, It is also known as the "British Covid-19 variant" or "Kent variant". A large number of cases in the second Coronavirus wave have been attributed to the UK Coronavirus variant. Apart from the usual Coronavirus symptoms of fever, body ache, persistent cough and loss of smell and taste, those affected by the British Covid-19 strain have also complained of conjunctivitis, rashes, upset stomach, sore throat and discolouration of toes and fingers.

d) **COVID-19 N440K VARIANT & COVID-19 E484Q VARIANT-** These variants have been responsible for a large number of Coronavirus cases in Maharashtra and Kerala, Dr V K Paul, Niti Aayog Member (Health) had earlier confirmed.

e) **COVID-19 B.1,36 VARIANT-** It is a region-specific variant found in a large number of Covid-19 cases in Bengaluru.

The Covid-19 virus variants are commonly referred by the name of the country where they were first discovered.

COVID-19 VIRUS MUTATION IN INDIA

Apart from the Covid-19 India variants, there are several mutations of the Coronavirus in the country as well. As the virus spreads it mutates and replicates, and some consider the mutations to be the reason behind the deadlier second Covid wave in India.

In the beginning the Covid-19 outbreak (reportedly from China's Wuhan) was a single strain outbreak, but as it moved from people to people and across countries it mutated. ICMR experts have said that they have been constantly watching the behaviour of Coronavirus mutations in the country.

The known Covid-19 mutations in India are —

COVID-19 DOBLE MUTATION STRAIN

The Double Mutant Coronavirus Strain or simply a combination of more than two Covid-19 variants has been found in samples in Punjab, Delhi and Maharashtra. Classified as the "B.1.617 variant"[7], it contains mutations from two separate coronavirus variants — L452R and E484Q[8], and has been found in close to 20% samples in the state of Maharashtra.

Covid-19 Triple Mutant Strain

As the name suggests, the "Triple Mutation Covid-19 variant" involves a strain of three above mentioned Covid-19 variants. A more complex strain, this Coronavirus mutation is considered to be the reason behind the surge in cases in Maharashtra and Delhi in the second wave, and experts say it is much more contagious.

COVID-19 VARIANT AND COVAXIN FACTOR-

However, in a sigh of relief, the Indian Council of Medical Research (ICMR) tweeted on Wednesday that its study has shown that Bharat Biotech's Covaxin neutralises multiple variants of SARS-CoV-2 and effectively neutralises the double mutant strain as well.

Reports stated that the ICMR-National Institute of Virology has successfully isolated and cultured multiple variants of concern of SARS-CoV-2 virus: B.1.1.7 (the UK variant)[9-10], B.1.1.28 (Brazil variant) [4]and B.1.351 (South Africa variant).[5]

The apex health research body said that it has demonstrated the neutralisation potential of Covaxin against the UK variant and Brazil variant. Notably, ICMR-NIV was recently successful in isolating and culturing the double mutant strain B.1.617[7] SARS-CoV-2 identified in certain regions of India and several other countries.

PREVENTION FROM STRAINS

The spread can be prevented by hygienic factors such as efficient sanitisation facilities, effective waste disposal, clean water and personal cleanliness.[11] Active immunization by vaccines[12] have been useful in preventing common epidemics caused by acutely infectious viruses. Vaccination can prevent diseases caused by human viruses that exists in only one antigenic and stable type. Unlike bacteria, viruses mimic the metabolic functions of their host cells. Antibiotics are not effective against viruses. It is difficult to identify the chemical compound that inhibit the multiplication of viruses. Despite these difficulties an effective antiviral drug has been developed against influenza virus. This drug targets a viral enzyme called neuraminidase. This is most effective when administered prophylactically or within the first 30 hours of symptom onset.

CONCLUSION

The emergence of viruses in the atmosphere resulting in the spread of disease named Covid 19 declared as global pandemic has posed a serious life threat to this world. It has gripped the entire globe and has badly affected the population at large. The evolution of different variants of the virus has made the task very challenging specially in terms of it's regional spread and varied nature and symptoms. There are different variants spread in different part of the world but with the on going research and medical advancement the spread could be contained to a great extent, Not only this but the launch of vaccines has provided a big hope towards overcoming the problem and combating the pandemic.

REFRENCES

1. Colaneri M, Seminari E, Novati S, et al. Severe acute respiratory syndrome coronavirus 2 RNA contamination of inanimate surface and virus viability in a healyh care emergency unit. Clinic Mivcrobiology Infection, August, 2020 26(8): 1094.

2. Wernery U, Lau SK, Woo PC. Middle East respiratory syndrome (MERS) coronavirus and dromedaries. Vet J., 2017; 220: 75-9.
3. Fowler RA, Lapinsky SE, Hallett D, Detsky As, Sibbald WJ, Slutsky AS, Stewart TE. Critically ill patients with severe acute respiratory syndrome (SARS) JAMA, 2003; 290(3): 367-73.
4. Candido D.S., Claro I.M., de Jesus J.G. Evolution and epidemic spread of SARS-CoV-2 in Brazil. Science, Sep 4, 2020; 369(6508): 1255-1260.
5. Shabir Ahmad Lone., Aijaz Ahmad Covid-19 pandemic-an African perspective ;Emerging Microbes & Infections, 2020; 9(1): 1300-1308.
6. A. Rambaut, N. Loman, O. Pybus, W. Barclay, J. Barrett, A. Carabelli, T. Connor, T. Peacock, D. L. Robetson, E. Volz; COVID-19 Genomiocs Consortium UK (CoG-UK), Preliminary genomic characterization of an emergent SARS-CoV-2 lineage in the UK defined by a novel set of spike mutations. Virology, Org 2020.
7. Koshy, Jacob "coronavirus l India 'double mutant' strain named B.1.617" The Hindu, 19 April 2021.
8. Sarah C, Varsha P, Santosh J, Pragya Y, Nivedita G, Mousmi D, Soumitra D, Anurag A, Sujeet S, Priya A, Samiran P M, Renu S, Balram B, Rajesh B, 'Convergent evolution of SARS-CoV-2 spike mutation, L452R, E484Q and P681R, in the second wave of COVID-19 in Maharashtra India,"bioRxiv, 22 April 2021.
9. Graham, Mark S; Sudre, Carole H; May, Anna: Antonelli, Michela; Murray,Benjamin; Varsavsky, Thomas; Klaser, Kerstin; Canas, Liane S; Molteni, Erika; Modat, Marc; Drew, David A. "Changes in symptomatology, reinfrection, and transmissibility association with the SARS-CoV-2 variant B.1.1.7: an ecological study" The Lancet Public Health, 12 April, 2021; 6(5): e335-e345.
10. Frampton D, Rampling T, Cross A, et al. Genomic characteristics and cilinical effect of the emergent SARS-CoV-2 B.1.1.7 lineage in London, UK: a whole genome sequencing and hospital-based cohort study. Lancet Infect Dis., April, 2021; 12.
11. Doung N, Suphanchaimat R, Panjangampatthana A, Janekrongtham C, Ruampoom D, Daochaeng N, 'Case control study use of personal protective measures and risk for SARS-CoV-2 infection' Emerging Infection Diseases, 2020; 26(11): 2607-2616.
12. M.E.Deming, N.L. Michael, M. Robb, M.S. Cohen, K.M. Neuzil, Accelerating development of SARS-Co-V-2 vaccines- the role for controlled human infectionmodels. N. Engl. J. Med., 2020; 383: e63.