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Emergence of Mutations in SARS-CoV-2 and the long term Covid-19 impact: is it for good or worse?

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ABSTRACT

SARS-CoV-2 is a type of corona virus that infects humans with pneumonia, and it began spreading in Wuhan, China, in late December of last year. So far, there is no cure for the emerging corona virus, and it is spreading rapidly, recording more than 200 million infections and deaths in large numbers. It is possible that infection with the emerging corona virus may be accompanied by some different symptoms, which are: cough, high temperature and shortness of breath. The Corona virus (SARS-CoV-2) has occupied a special importance since it invaded the world in 2020, and perhaps we do not exaggerate if we say that this unprecedented pandemic of the twenty-first century has changed many features of people's lives in it, and this virus has appeared in several different mutations, as The severity of the virus increased and became more resistant to the vaccine. The aim of this descriptive minireview, generally, is to shed light on the mergence of different mutations in SARS-CoV-2 and the long term of Covid-19 impact.

KEYWORDS: Novel coronavirus, SARS-Cov-2, infections, Emergence of mutations , Covid-19 .

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INTRODUCTION

Coronavirus is a newly emerging infection, and it was recorded or appeared in China in 2003 and Saudi Arabia in 2012, and this virus is very rare and transmitted between people through infection, and it affects more in the elderly and people with weak immunity.

Corona virus is one of the viruses that attack the respiratory system, and it was discovered in the 1960s, and it was called by this name because its shape resembles a crown, and it belongs to the group of coronaviruses (coronaviruses) that are generally considered not dangerous, and usually cause simple cold symptoms. However, there are some dangerous types. A certain type may cause the death of more than 475 people from the Middle East with Middle East Respiratory Syndrome (MERS), which first appeared in 2012 in Saudi Arabia, and then in other countries in the Middle East. And Africa, Asia, and Europe, and before that in 2003 another type of this family spread, and killed a number of patients, and it was called at that time Severe acute respiratory syndrome (SARS).

TRANSMISSION AND SPREAD

Severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, causes coronavirus disease 2019, or COVID-19).

The virus that causes COVID-19 appears to spread easily between people, and scientists will continue to discover more about how it spreads over time. The data showed that it spreads through close personal contact (within 6 feet, or 2 metres). The virus spreads through respiratory droplets released when an infected person coughs, sneezes, breathes, sings or talks. This spray can be inhaled or put into the mouth, nose, or eyes of a nearby person.

COVID-19 can sometimes be spread by exposure to small droplets or mists that remain in the air for several minutes or hours. This is called airborne transmission. It is not yet known how common the virus is to spread in this way.

It can also be transmitted if a person touches a surface or object contaminated with the virus and then touches their mouth, nose or eyes, but the risk of transmission in this way is low.

CLINICAL MANIFESTATION AND SYMPTOMS

Symptoms of the Corona virus are usually similar to the symptoms of an upper respiratory infection, such as the symptoms of the common cold or influenza, which can be controlled by rest, drinking fluids, and taking over-the-counter medications. Corona virus fever and runny nose.

coughing; sneezing; sore throat. Feeling tired and exhausted. 20% of the patients suffer from severe pneumonia

SARS-CoV-2 MUTATION

A mutation is a change in the vital genetic information encoded or known as genetic information, which is present in the deoxyribonucleic acid (RNA) and chromosomes in the DNA. The genetic makeup and stability of SARS-CoV-2 are major determinants of its virulence and disease pathogenesis.

Scientists have revealed that the Corona virus may go through sharp mutations during its replication that may put us in front of a new, more virulent version of the virus. Imagine that you copy and paste a certain sentence, and then imagine that the result of this process is half a correct sentence and another half random letters. The virus's genetic genome is very different from the original genome of the virus, in a phenomenon called recombination.

An American study in which three types of Corona virus were taken showed that the three viruses had a severe recombination of their genes during their replication in the laboratory.

What raises the concerns of scientists about what is happening is that this phenomenon of recombination may:

• Suddenly and without warning make the virus turn into more dangerous strains while it is in the body.

• It allows an exchange in the genetic makeup of more than one strain of the Corona virus during division and replication when meeting in one patient's body, which is rare.

• Cause changes in certain proteins found within the genetic structure of viruses called (The spike protein), and these proteins are the genetic part responsible for making viruses able to infect the human cell, which is something that may be dangerous, as it may make the Corona virus pave the way for viruses Others begin to infect humans after their effect was limited to animals.

The genetic code of the coronavirus is preserved in about 30,000 parts of its RNA. When the virus infects human cells, the genetic code is copied to make new virus particles. During the copying process, errors occur that turn into mutations in the new virus, knowing that most of them have little effect, while some weaken the virus and die.

Sometimes, the mutation helps the virus, for example, by making it attachable to human cells more effectively, or enabling it to evade some of the defense mechanisms that the body builds after infection or vaccination.

The genetic sequences of early SARS-CoV-2 isolates from infected patients in Wuhan showed more than 88% nucleotide homology with the two strains of SARS coronaviruses very similar to the strains isolated from bats, indicating the animal source of the virus. Indeed, bats have been identified as reservoir hosts for SARS-CoV-2.

One of the first mutations that occurred was the so-called "D614G" mutation, which stabilizes the barbed proteins that enable the virus to attach to and infect human cells.

The mutations of concern appear in three variants, rapidly spreading B117 and 501YV1 first detected in Kent, Britain, B1351 and 501YV2 first found in South Africa, and P1 and 501YV3 first detected in Brazil.

FINAL IMPACT OF MUTATION

Although at first glance what is happening may seem dangerous, scientists believe that the phenomenon of recombination taking place may have a positive side in the long term in their efforts to defeat the virus and find drugs that may help to overcome the current pandemic.

While mutations may sometimes be positive for the virus, at other times they may cause abnormalities in the copied viral particles that can impair their structure, making the virus less able to carry out its usual functions.

And between the positive and the negative, it is still too early to resolve the issue regarding the severity of the recombination phenomenon experienced by the viruses that cause the Corona pandemic, and whether this phenomenon may pave the way for a new pandemic or may be a glimmer of hope for finding effective treatments.

REFERENCES

I. World Health Organization. Novel Coronavirus (2019-nCoV) Available at https://www.who.int/emergencies/diseases/novel-coronavirus-2019. Accessed February 7, 2020.

II. Huang C, Wang Y, Li X, et al. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet, 395: 497-506.

III. Neumann-Podczaska A, Al-Saad SR, Karbowski LM, Chojnicki M, Tobis S, Wieczorowska-Tobis K. COVID 19 - Clinical Picture in the Elderly Population: A Qualitative Systematic Review. Aging Dis. 2020;11(4):988-1008. Published 2020 Jul 23. doi:10.14336/AD.2020.0620

IV. Wu YC, Chen CS, Chan YJ. The outbreak of COVID-19: An overview. J Chin Med Assoc. 2020;83(3):217-220. doi:10.1097/JCMA.0000000000000270

V. Collins F (2020) Genome Data Help Track Community Spread of COVID-19. NIH Director's Blog. Available at: https://directorsblog.nih.gov/2020/07/21/genome-data-helps-track-community-spread-of-covid-19/

VI. Nguyen, T.T., Pathirana, P.N., Nguyen, T. *et al.* Genomic mutations and changes in protein secondary structure and solvent accessibility of SARS-CoV-2 (COVID-19 virus). *Sci Rep* 11, 3487 (2021). https://doi.org/10.1038/s41598-021-83105-3

VII. Chen AT, Altschuler K, Zhan SH, Chan YA, Deverman BE. COVID-19 CG: Tracking SARS-CoV-2 mutations by locations and dates of interest. Preprint. *bioRxiv*. 2020;2020.09.23.310565. Published 2020 Sep 28. doi:10.1101/2020.09.23.310565

VIII. Covid-19: WHO warns against "vaccine nationalism" or face further virus mutations *BMJ* 2021; 372 doi: https://doi.org/10.1136/bmj.n292

IX. A.A.Dawood .Mutated COVID-19 may foretell a great risk for mankind I n the future. New Microbes and New Infections Volume 35, May 2020, 100673

X. Wu, Y. Peng, B. Huang, X. Ding, X. Wang, P. Niu, *et al.* Genome composition and divergence of the novel coronavirus (2019-nCoV) originating in China . Cell Host Microbe (2020), 10.1016/j.chom.2020.02.001

XI. H.A. Rothan, S.N. Byrareddy The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak .J Autoimm (2020), 10.1016/j.jaut.2020.102433

XII. Robinson J, Banerjee I, Leclézio A, Sathian B. COVID-19 and mutations a threat level assessment. Nepal J Epidemiol. 2021;11(1):983-987. Published 2021 Mar 31. doi:10.3126/nje.v11i1.35659

XIII. Mahase E. Covid-19: What have we learnt about the new variant in the UK? *BMJ*. 2020. December 23;371:m4944. 10.1136/bmj.m4944 PMid:

XIV. Wang P, Nair MS, Liu L, et al. . Antibody Resistance of SARS-CoV-2 Variants B.1.351 and B.1.1.7. *Nature.* 2021. March 8. 10.1038/s41586-021-03398-2 PMid: .

XV. Almubaid Z, Al-Mubaid H. Analysis and comparison of genetic variants and mutations of the novel coronavirus SARS-CoV-2. *Gene Rep.* 2021. June;23:101064. 10.1016/j.genrep.2021.101064 PMid: PMCid:

XVI. Tang JW, Toovey OT, Harvey KN, Hui DD. Introduction of the South African SARS-CoV-2 variant 501Y. V2 into the UK. *The Journal of infection.* 2021. January 17. 10.1016/j.jinf.2021.01.007 PMid: PMCid