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View of the COVID-19 Virus and the New SARS-COV-2

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Abstract: ***This paper provides a bird's eye view of the COVID-19 virus and the new SARS-COV-2 variant. The coronavirus (2019-nCoV) pandemic is causing a global public health crisis. The virus was transmitted to humans, and it is not yet known which animal was the intermediary, at Wuhan, in Hubei province, China in December 2019[1]***

Keywords: Corona virus, COVID 19, newSARS-COV-2

1. Introduction

What we know about COVID-19 and the new SARS-COV-2 variant?
Coronaviruses (CoVs) are RNA viruses and they have their ability to rapidly mutate and recombine, Figure 1. It is known that CoVs cause respiratory or intestinal infections in both humans and animals [2]. There have been around 86, 749, 940 million confirmed cases of COVID-19 and 1,890,342 million reported deaths to date (8 January 2021) worldwide reported to WHO [3] .

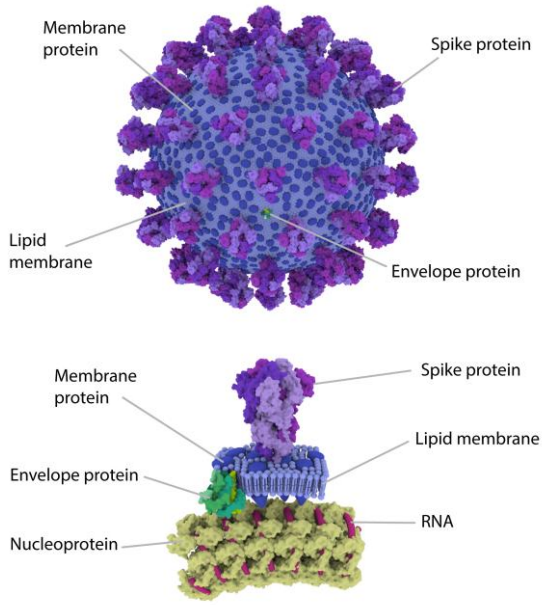

Figure 1: Shows whol -virion and spike- section -close- up
Adapted from [4]

COVID-19 can cause a mild infection in around eight out ten people infected with it. The main symptoms are a fever, cough and loss of smell and/or taste [5]. Recent data show that other coronaviruses have short-lived immunity; the people who recover from the disease may lose their immunity within months and re-infection is more likely. This could happen in less than 12 months in some cases [5]. Therefore, scientists have stated that COVID-19 could reinfect people annually similar to the common cold and they suggest that acquired immunity is the key to ending the COVID-19 pandemic [6].

Brazeau et al [7] have reported on the estimated overall infection fatality ratio (IFR) resulting from COVID-19 infections. They distinguished between high- and low-income countries. In the former, there is an IFR of 1.15% (95% prediction interval 0.78-1.79), whereas in the latter, there is an IFR of 0.23% (95% prediction interval 0.14-0.42). In terms of age groups, every additional eight years of age roughly double the risk of dying from COVID-19. For example, the age-specific IFR is 0.1% or less for those aged less than 40 years old, but it rises to over 5% among those aged over 80 years old.

Was the COVID-19 mutation expected?
Over time, new variants of viruses are expected because they mutate constantly. However, many mutations are silent and sometimes new variants appear and disappear spontaneously without causing changes in the structure of the protein [8]. In December 2020 the United Kingdom (UK) reported a new variant strain of SARS-CoV-2 that contained a series of mutations. This variant was highly prevalent in London and southeast England [9]. Based on these mutations, scientists predicted that the new virus strain SARS-CoV-2 was potentially more rapidly transmissible than the other circulating strains of SARS-CoV-2 [9] . However, it is not yet known for sure whether the virus is more infectious than COVID-19. In addition, it is not yet known whether this variant causes more or less severe illness or an increased risk of death. However, the World Health Organization (WHO)[10] stated that preliminary analyses had found no change in disease severity (as measured by length of hospitalization and 28-day case fatality), or the occurrence of re-infection between variant cases, compared to other SARS-CoV-2 viruses circulating in the UK. Scientists are still working to collect information in order to understand the characteristics of the variant and its implications.

Is there any relationship between the UK new variant and a new variant in South Africa?
Also in December 2020, on the 18th, the government of South Africa reported the detection of a new strain of coronavirus in its country in a similar situation to the new variant in the UK. Although there are similarities between

the two variants, such as the South African strain shares the N501Y mutation and several others, the emergence of the South African variant was totally independent of the emergence of the strain found in the UK and the two are not related [11].

Is the COVID test useful for the diagnosis of the new SARS-COV-2?

Experts have reported that most commercial polymerase chain reaction (PCR) tests that are used to diagnose COVID-19 have multiple targets that are used for detecting the virus, therefore if one of these targets is impacted by mutation, the other PCR targets should still work [12].

Is the new variant more dangerous?

It is still not known with certainty whether the new SARS-COV-2 causes patients to be more or less severely ill, as the course of the virus has been altered by interventions such as safety measures and lockdowns [11]. However, as the spread of the virus increases, more people will become infected, therefore more people will need hospital and this will be enough to cause problems for hospitals[13] .

Does the vaccine have a role to play with the new SARS-COV-2?

Corona viruses have been studied for over 50 years, therefore experts have information about these viruses in terms of their structure, genomes and lifecycle. This was a great help in the work done to create a vaccine in less than 1 year [14]. COVID-19 vaccines are polyclonal and they can produce antibodies that target several parts of the spike protein [15]. Experts in this field have confirmed that an individual's immune system is 'trained' by these vaccines to attack a number of different parts of the virus. This means that a mutation in one part of the spike protein does not affect the efficiency of the vaccine as it will still target the other parts of the spike protein. However, it may be that the viruses have the ability to generate strains that are resistant to vaccines [16]. This would require a vaccine that is similar to the flu vaccine, in that it would need to be regularly updated. Furthermore, it is not yet known how long immunity from this vaccine will last [17]. However, it is important that the public understand that being infected by this virus is not a good thing. Some members of the general public, most noticeably the younger generations, have adopted a rather carefree attitude to coronavirus infection, perhaps believing that by getting infected they will contribute to herd immunity. However, failing to follow regulations places themselves and others at risk, and if they are infected again by a new variant of the virus in the coming years they run the risk of more severe lung disease[10].Therefore, face masks still should be worn, people should stay two metres apart and we should wash our hands with soap and water for at least 20 seconds or use a hand sanitizer. These are all important points. Experts believe that getting a COVID-19 vaccine may help keep you from getting seriously ill, even if you do become infected with COVID-19[10].

Why is Africa's COVID-19 mortality rate low?

Scientists have given a number of reasons for this. The demography of the African population is such that the continent has a relatively young population in which those under the age of 25 years constitute more than 60% of the population [18].Also, there are many incidences of some infectious disease like diarrheal diseases, malaria, measles and parasites. This may play an important role as it may mean that people's immune systems are better at warding off certain kinds of infections [19]. It may also mean that African citizens gain cross-immunity from other coronaviruses or colds and flu, giving them an extra degree of immunity towards COVID-19[20][21].

In addition, scientists have found that genetic factors may a play a role in people's response to the disease. Furthermore, low rates of travel and more outdoor living might also help to reduce the number of infections and deaths from COVID-19. Finally, Africa has experience in epidemic control from tackling other diseases [20][21].

2. Conclusion

Infection with COVID-19 may cause a serious problem and it places a great deal of stress and pressure on our healthcare services. Re-infection can occur, therefore it is important to continue to follow the safety measures, including lockdowns when they are needed. COVID-19 vaccines have been approved by a regulatory authority and this shows that they are suitable and more than 90% effective in protecting people from becoming ill with COVID-19. COVID-19 vaccines will help to protect people from serious illness and complications, therefore it is important for us all to receive it.

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