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The new South African variant SARS-CoV-2

Viruses mutate – this is the reality we face with any virus, and we need to be alert to the possibility that these mutations may change the way the virus behaves in the population, and the way the population is able to respond to the virus. Mutations raise concerns about changes in the virulence, or transmissibility of the virus. We also become concerned that the new variants that emerge may be able to escape immunity provided by previous natural infection with other strains of the virus, or that provided by vaccination. Because the enzymes that copy viral RNA for replication are error prone, accumulation of mutations is a prominent part of the replication of RNA viruses, such as SARS-CoV-2 (the virus that causes COVID19). Coronaviruses, however, mutate at a slightly slower rate than most other RNA viruses, because they have access to a “proof-reading” enzyme that is able to change potentially fatal errors made during the copying process as the virus replicates. This is a good thing as the emergence of new and potentially more problematic strains is more limited over time in comparison with other viruses such as HIV or influenza. Many regions in the world carry out surveillance work designed to detect mutations in SARS-CoV-2 and to determine the significance of these mutations as they emerge. These surveillance programs help to track the movement of the mutated strains and to detect changes in the patterns of transmission and severity of illnesses in infected people.

Within South Africa, a new variant of the virus has emerged and is spreading through the population of the country. This new strain of the virus shows multiple mutations in the spike protein, three of which are on the RBD (receptor binding domain). The mutation that is of main interest is the N501Y mutation which binds to the ACE2 receptor. Because this is the receptor the virus uses to gain entry into human cells, the concern is that this mutation may allow increased transmissibility and higher viral loads in the upper airways than we encountered in the previous variants of SARS-CoV-2. Humans have a high number of these receptors in the nose, sinuses and lung tissue, and this is where higher viral loads would be most damaging. The remaining two mutations on the RBD seem to reduce sensitivity of the virus to some antibodies. The implication of this finding is that prior immunity may not be as protective against the new strain as against the previous dominant strain we encountered in the first wave of the pandemic. The emergence of this new strain has coincided with the start of the second wave of the COVID pandemic in Africa, and South African teams are closely monitoring the movement of the new strain, and are also working to determine the virulence and transmissibility of this strain.

At this early stage in monitoring the new strain of the virus, there are many things we need to consider:

1. There is no evidence at this stage that the new strain contributes to more severe illness in infected people. This is a topic being addressed through research and surveillance.
2. It is suspected that the new strain is associated with higher viral loads and possibly higher rates of transmission in the population, but this still has to be confirmed with ongoing work in our surveillance programs.

3. The range of symptoms at this stage seems to be the same as those encountered with other strains of the virus.
4. The degree of protection conferred by prior infection with the earlier strains of the virus during the first wave is still unknown, and we therefore have to manage all people in exactly the same way, as if fully susceptible despite previous exposure. There is no room for complacency in people who had COVID in the past few months.
5. Clinical management, quarantine and isolation practices remain the same as with other strains of SARS-CoV-2.
6. The current PCR and antibody tests are likely to remain effective and this aspect will be evaluated and confirmed.
7. The extent to which the new variants will affect the efficacy of the current vaccines is not known.

To date, the following non-pharmaceutical tools to reduce risk and transmission still apply IN FULL with the new strains of the virus:

1. The wearing of face masks covering both the mouth and the nose is mandatory.
2. Social distancing is an essential tool in reducing risk of contracting this infection.
3. Hand hygiene – frequent sanitizing and hand washing.
4. Avoid gatherings of people.
5. Follow the government's requirements as released through various stages of lockdown and as gazetted from time to time.

Further information is available by clicking on the following link:

https://www.nicd.ac.za/wp-content/uploads/2020/12/New-Variant-of-SARS-CoV-2_Frequently-Asked-Questions_v9_19-December-2020_Final.pdf

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