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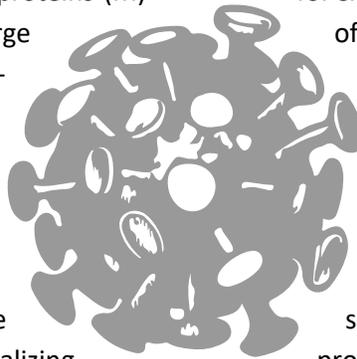
NEWS BEADS

Corona focus

Emerging variant of concern, Omicron – should we worry?

Revisiting the Corona virus structure

Severe acute respiratory syndrome virus 2 (SARS-CoV-2) was the name given to novel corona virus causing COVID-19. This RNS virus has four structural proteins including – spike surface glycoproteins (S), envelop proteins (E), matrix proteins (M) and nucleocapsid proteins (N).¹ Two large polyproteins, ORF1a and ORF1b are the non-structural proteins and they cleave to form 16 other non-structural proteins.² Out of these important proteins – virus depends on S proteins for pathogenicity (receptor binding and membrane fusion). It also determines the transmission capabilities.³ Most of the innate immune mechanisms and vaccine induced neutralizing antibodies target these S proteins.⁴ Therefore, significant changes in the S encoding gene, S gene, influences not only the transmissibility properties of SARS-CoV-2 but also the efficacy of existing vaccines.



Though, the pandemic started by late 2019, there is no uniform protocol and guidelines approved by any apex bodies

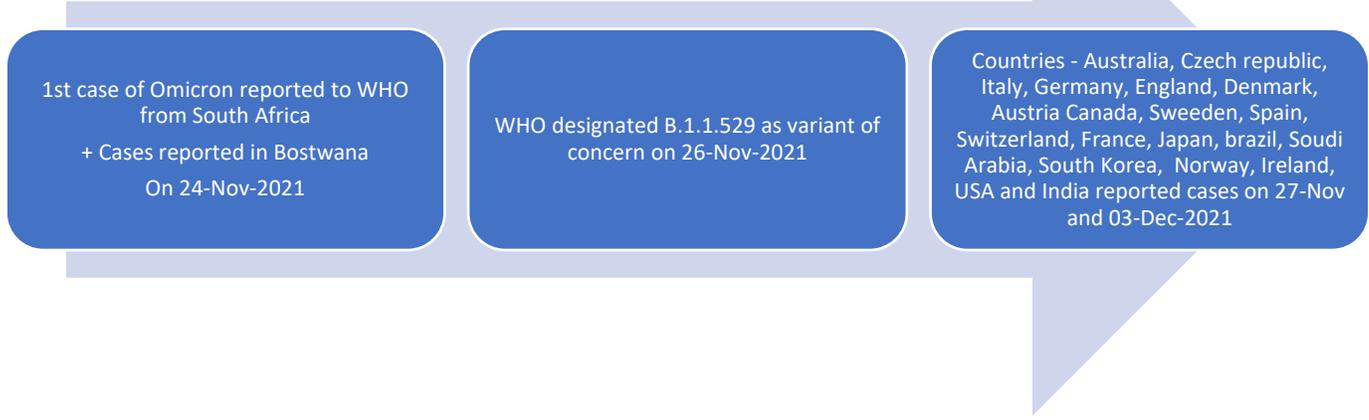
to detect and report SARS-CoV-2 till date. Nations have developed and adopted different methods of viral detection. Most of the RT-PCR detection and surveillance technologies for SARS-CoV-2 uses the primers and probe sequences of RdRP, CN-CDC-ORF1ab, HKU-ORF1b and ORF1ab gene. However, NIH-TH-N, HKU-N and US-CDCN-2 probes targeting N genes are also in vogue. ORF1ab gene is the largest gene, codes for large ORF1a and ORF1b non-structural polyprotein. These non-structural proteins bring about the viral transcription, replication, suppression of host immune responses and proteolytic processing.² Therefore, real-time RT-PCR tests targeting ORF genes and N genes are not specific to novel SARS-CoV-2. Moreover, use of specific probes for detecting novel SARS-CoV-2 are restricted to respiratory virus surveillance and research according to CDC.⁵ Therefore, unless extensively sought for, mutations in the corona virus is likely to be missed with routine RT-PCR detection and surveillance techniques.

Mutations in Corona virus

Even though the mutations in SARS-CoV-2 are expected, there no major changes in the viral gene since late 2019 for more than 11 months.⁶ Since late 2020, virus is consistently evolving with structural changes that are significantly altering its transmissibility and antigenicity leading generation of 'variants of concern'.⁶ This has far reached consequences on the response to the viral infection with respect to changing immune profile of large human

population subjected to most rapid vaccination drives ever in the history. Mutations evidenced in Alpha, Gamma, Lambda are associated with increased infectivity.⁷ The Omicron B.1.1.529 variant has overall 50 mutations, including more than 30 on the spike protein alone.⁸ This may increase transmissibility and improve binding affinity. Such mutations may also enable virus to partially escape the antibodies.⁹

B.1.1.529 variant – Omicron: variant of concern



What does WHO say about the Omicron?

Transmissibility	Disease severity	Vaccine effect	Current testing	Preventive measures
<ul style="list-style-type: none">•Studies are underway to unedrstand the transmissible potential of the variant	<ul style="list-style-type: none">•Understanding takes weeks to months•Mild disease reported on multiple occasions•Possible reinfections	<ul style="list-style-type: none">•Still not clear	<ul style="list-style-type: none">•RT-PCR to continue to detect infection of SARS-CoV-2	<ul style="list-style-type: none">•Enhance surveillance•Share genome sequence•Report initial cases•Implement preventive measures

Omicron is a variant of concern. Until more information is available, we need to follow strict COVID appropriate behavior.

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Mutation saga continues

Omicron itself is fast mutating. It is found to have two sub-lineages BA.1 and BA.2.¹⁰ Co-infections of delta variant and omicron variant is possible.¹¹ On the other hand, co-infection of influenza and omicron (flurona) also reported.¹² French researchers identified yet another sub-lineage of B.1.640 and named it IHU variant.¹³ It is understandable that newer variants of COVID may create fresh chaos globally. With all these seemingly unending sagas of new mutations and adaptability from the viral front, the only option left for us is to follow COVID appropriate behavior.



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Can RT-PCR detect Omicron?

Specific primers targeting critical S-gene mutations are yet to be developed for mass usage. Many researchers are working on it. Meanwhile, genome sequencing is done for suspected cases of Omicron infection. In the routine RT-PCR, if only two genes are detected and there is evidence of S-gene

drop out,⁹ it is an indication of omicron variant.¹⁴ A positive RT-PCR report indicates an ongoing infection with SARS-CoV-2 and do not necessarily point out the variants. Till further evidence appears, S-gene target failure can be considered as a proxy marker of Omicron.

Why Omicron is a concern?

- Omicron may not respond to monoclonal antibody therapy
- Six variants with S-gene mutations leading to change in spike receptor domain found resistant to etesevimab, casirivimab, imdevimab and other combinations

Will there be lockdown?

As of now these are the WHO's opinions

- WHO – **refrain** from imposing blanket travel bans; such bans may negatively affect lives and livelihoods
- WHO – implement scientifically proven evidence based preventive measures
- Remain vigilant about the COVID-19 signs and symptoms
- Follow COVID appropriate behavior

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