

Dr KK Aggarwal
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HCFI DR KK AGGARWAL RESEARCH FUND

US and Omicron Update

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- There have been over 5.4 million deaths since the onset of the pandemic and the US is leading the toll with 8,37,671 deaths. There is loss not only in terms of lives, but also the quality of life.
- Variants happen because of two major factors. High number of cases increase risk of mutations. Some mutations lead to new variants. It's the changes in the spike protein that are of concern.
- It has been a year since a new variant (Omicron) was detected since Delta variant was identified in October 2020.
- The Omicron variant has over 50 mutations not seen in combination before. There are 30+ mutations in the gene for the spike protein that the coronavirus uses to attach to human cells.
- Omicron's spike protein has several mutations that are found in other variants of concern (VOC) and that are thought to make the virus more infectious, including D614G, N501Y and K417N.
- It was designated as VOC by the World Health Organization (WHO) on 26th November, 2021 and has been identified in more than 90 countries.
- Early December, a California resident who had returned from South Africa was the first identified American to be infected.
- It spreads 2 to 3 times faster than Delta and Cases double every 2 to 4 days. People are 5 times more likely to be reinfected with Omicron compared to other VOC.
- Recent research from HKUMed (Hong Kong) found that the Omicron severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can infect faster and better than Delta in human bronchus but with less severe infection in lung. At 24 hours after infection, Omicron replicated 70 times higher than the Delta variant and the original SARS-CoV-2 virus in the bronchial tissue. But it replicated less efficiently (10 times lower) in lung tissue than the original SARS-CoV-2. This explains its high transmissibility and probably the less associated morbidity.
- Omicron is spreading rapidly in the US. It accounted for 73% of new infections last week, showing nearly a 6-fold increase within a week, as per CDC (Dec. 20, 2021).
- A study summarized the use of over-the-counter (OTC) rapid antigen tests. Seven different antigen-detecting rapid diagnostic tests (Ag-RDTs) were used (some approved/some in the process of being approved). It was found that the analytical sensitivity to detect Omicron was lower than for

the other VOCs in most of the tests evaluated. One test (Flowflex-ACON Biotech) showed the highest overall sensitivity for all SARS-CoV-2 isolates used compared to the others, and here, Omicron was detected with even slightly higher sensitivity than Delta but still lower than Alpha, Beta, Gamma and the pre-VOC SARS-CoV.

- Evaluation of coronavirus disease 2019 (COVID-19) vaccine effectiveness over time (Delta; Pre-Omicron) showed that two doses of mRNA or adenovirus vector vaccines elicit high levels of protection from symptomatic disease, but the protection waned over time at 6 months. Emerging studies show that a third dose (booster) of the same type improved effectiveness to >90%.
- In a Danish cohort study conducted at Statens Serum Institut (SSI), a third dose of either Pfizer-BioNTech or Moderna vaccine led to a "significant increase" in protection against the Omicron variant in the elderly. Among those who recently had their second vaccine dose, effectiveness against Omicron was measured at 55.2% for Pfizer-BioNTech and 36.7% for Moderna, compared to unvaccinated people. It was seen that protection quickly waned over the course of 5 months. Protection was lower and decreased faster against Omicron than against the Delta variant after a primary vaccination course. The third dose of Pfizer-BioNTech's vaccine restored protection to 54.6% in people aged 60 or more who had been inoculated 14 to 44 days earlier, compared to those with only two doses.
- Another study from Hong Kong showed that a third dose of the Pfizer vaccine given to those who received two doses of either the Pfizer or CoronaVac provides protective levels of protective antibody against the Omicron variant. Whereas the third dose of CoronaVac given to those who received two previous doses of CoronaVac does not provide adequate levels of protective antibody.
- The Novavax (NVX-CoV2373) vaccine is a promising vaccine. It uses a novel platform where a different virus (a baculovirus) is combined with the genetic information needed to make a spike protein, a key fragment of SARS-CoV-2. When moth cells are infected with this virus, they manufacture the spike protein. Scientists then harvest and fuse those proteins with a nanoparticle, which combine with spike proteins are what is injected in the Novavax vaccine.
- The first study with Novavax was done in Mexico and US, which showed 90.4% reduction in symptomatic cases from 7 days after second dose compared with people given placebo. The second study conducted in the UK found 89.7% efficacy in reducing symptomatic cases.
- Two dose primary regimen of the Novavax demonstrated cross-reactive immune responses against Omicron and other variants. The third dose increased immune responses with a 9.3-fold rise in anti-spike IgG and 19.9-fold increase in angiotensin-converting enzyme 2 (ACE2) inhibition. Immune responses in adolescents were 2- to 4-fold higher than adults against broad array of variants of interests (VOIs) and VOCs. After two doses, Omicron wild-type neutralization was <4-fold lower than prototype, suggesting that both a booster dose as well as an Omicron-specific vaccine may be beneficial.
- The monoclonal antibodies and antiviral pills are intended to keep people newly diagnosed with COVID from being hospitalized.
- The two commonly used monoclonal antibody treatments are casirivimab/indevimab and baml-anivimab/etesevimab. These have reduced activity against the Omicron variant of SARS-CoV-2 and may have little to no effectiveness in patients infected with the Omicron variant. Their use has been suspended until further notice (as of 23rd December) since the Omicron is spreading very rapidly.
- Sotrovimab appears to retain effectiveness against Omicron.
- There is a new long-acting monoclonal antibody combination (tixagevimab co-packaged with cilgavimab), which has been granted emergency use authorization (EUA) by the US Food and Drug Administration (FDA) for use as pre-exposure prophylaxis for patients at high risk of severe COVID-19.
- Omicron has escaped neutralization from the family of monoclonal antibodies and their combinations that are available with the possible exception of sotrovimab.
- On December 22, the FDA authorized the first easy to use pill "Paxlovid" (Pfizer) to treat COVID-19 in the US with the surge in Omicron cases. An 89% reduction in the number of hospitalizations or deaths was seen compared with placebo; 6.3% (placebo) vs. 0.8% (Paxlovid). A 94% reduction in

people aged 65 years and older was seen with 10-fold decline in viral load. Fewer adverse events and lab data showed potent anti-Omicron activity.

- Molnupiravir (Merck) was granted EUA on 23rd December. It is indicated for the treatment of mild-to-moderate COVID-19 in adults with positive results of direct SARS-CoV-2 viral testing, and who are at high-risk for progression to severe COVID-19, including hospitalization or death, and for whom alternative COVID-19 treatment options authorized by the FDA are not accessible or clinically appropriate. It's not recommended for use during pregnancy because of potential fetal harm (animal studies).
- We have to use the Swiss Cheese model, which means that its not just one thing which will help. The pandemic has to be addressed in as many different ways as we can.
- Patients hospitalized in the US are mainly Delta. Its only in the last week that there has been a surge of Omicron.
- There is no antibody response with J&J vaccine against Omicron as per a study from South Africa.
- It is likely that the Omicron will leave some residual effect on the body even if it is a mild disease.
- The two new oral pills will probably be complementary to the monoclonal antibodies in the long-term. Their distribution will be based on need and geographical location and access to healthcare. Monoclonal antibodies will be available in big hospitals, whereas in the periphery, the oral pills will be necessary.
- There has been a 10-15% decline in hospitalization rate in the last week. Its too soon to know how many of the 73% cases are symptomatic as the country is witnessing a rise right now and the picture is likely to become clearer in the coming weeks. The information is emerging and rapidly changing.
- The chances of getting long COVID from Omicron are not known yet.
- We have to be vigilant to understand the pattern of the local infection.
- We should not assume that Omicron is mild; every patient has the potential to become sick.
- New protocol in South Africa: Asymptomatic positive cases do not need to isolate. Only the mild and symptomatic patients need to isolate for 8 days. Moderately ill patients are isolated for 10 days regardless of vaccination status. No quarantine required for contacts/family. Also, no need of contact tracing/testing of asymptomatic patients.

Participants – Member National Medical Associations:

Dr Yeh Woei Chong, Singapore, Chair-CMAAO; Dr Ravi Naidu, Malaysia, Immediate Past President-CMAAO; Dr Marthanda Pillai, India Member-World Medical Council, Advisor-CMAAO; Dr Angelique Coetzee, South Africa; Dr Akhtar Hussain, South Africa; Dr Md Jamaluddin Chowdhury, Bangladesh; Dr Qaiser Sajjad, Pakistan; Dr Prakash Budhakoti, Nepal

Invitees: Dr Monica Vasudev, USA; Dr SK Aggarwal; Dr Nidhi Dhawan; Dr Anita Dhar; Dr Shashank Joshi; Dr Darakhshan Khan; Dr HE Randere; Dr Patricia La'Brooyi; Dr Chee Kheong Chan; Dr Tang Kim Lian; Ms Nina Gupta; Dr S Sharma, Editor-IJCP Group

Moderator: Mr Saurabh Aggarwal

Source: *Minutes of an International Weekly Meeting on COVID-19 held by HCFI Dr KK Aggarwal Research Fund (25th December, 2021, Saturday 9.30 am-11 am)*

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People with HIV have a Higher Risk for Heart Failure

A study, published in *Mayo Clinic Proceedings*, has noted that people with HIV have a higher risk of developing heart failure compared to those without HIV. Researchers identified 38,868 people with HIV who were members of Kaiser Permanente from 2000 to 2016 in Northern California, Southern California and the Mid-Atlantic States. Every person was matched with up to 10 Kaiser Permanente members from the corresponding region who did not have HIV, but were the same age, sex and race (n = 386,586). People in both the groups who developed heart failure during follow-up were identified. People with HIV had a 68% higher likelihood of developing heart failure compared to those without HIV. Additionally, people aged 40 years or below, females or those of Asian or Pacific Islander descent had the highest risk… (*Source: HT – ANI*)