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A Reflection on Omicron Research



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Raghavendra Rao M.V^{*1}, Dilip Mathai², Manickdass³, V.Raghunandan Reddy⁴, Raghu Hn⁵, Yogendra Kumar Verma⁶, Chennamchetty Vijay Kumar⁷

1Department of Medicine, Apollo Institute of Medical Sciences and Research, Jubilee Hills, Hyderabad, Telangana, India

2Department of Medicine, Dean, Apollo Institute of Medical Science and Research, Hyderabad, TS, India

3Department of Microbiology, Apollo Institute of Medical Sciences and Research, Hyderabad, TS, India

4Librarian, Apollo Institute of Medical Sciences and Research, Hyderabad, TS, India

5Medical student finishing up electives at Loretto hospital ,645 S Central Ave, Chicago, IL 60644, USA

6Microbiology, Mandsaur University, Mandsaur, Madhya Pradesh, India.

7Department of Pulmonary Medicine, Apollo Institute of Medical Science and Research, Hyderabad, TS, India.

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ABSTRACT

Omicron is bad yet it could be worse. It is more contagious and less severe. Omicron is a blessing in disguise variant that causes mild infections like a common cold with rapid spread and is an indication for the end of Pandemic. Omicron is currently shaking the world to its core. Omicron is spreading like fire. This variant of the coronavirus has a higher rate of asymptomatic "carriage" than earlier variants. Both studies found a higher rate of infection than during previous outbreaks, and a higher proportion of asymptomatic carriers. Due to a much shorter incubation period, faster multiplication rate, and droplet-based transmission due to mainly upper respiratory tract involvement its spread is occurring at a much faster pace. "UK becomes the first country in Europe to pass 150,000 COVID deaths Omicron clouds forecasts for Covid end game. Omicron is a variant of nSARS-CoV-2 that has been identified initially in COVID-19 patients in Botswana and South Africa.



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INTRODUCTION

COVID pandemic has given humanity a strong counter. Almost all countries have been destroyed. The financial system has held up. Many have lost their loving ones.

Early data suggest that infection due to Omicron is associated with a two-thirds (70%) reduction in the risk of COVID-19 hospitalization when compared to Delta.

People who are exposed to omicron appear to get sick faster and may have symptoms that are different than those of other variants. In fully vaccinated people and especially after getting the booster, Omicron appears to result in mild illness that can resemble the common cold, (URI -upper respiratory tract infection-Flu-like illness, acute bronchitis-laryngitis), comprises mainly of fever, chills, cough, fatigue, or tiredness, congestion, sore throat, hoarse voice, and runny nose, typically lasts for ~5 days. (Shortness of breath (Pneumonia, hypoxia), loss of taste and smell seems to be quite uncommon). Research, however, suggests that vaccination can greatly reduce the risk for long Covid. The sheer speed of omicron's spread could mean that the variant will run its course quickly.

Emergence:

November 24, 2021, South Africa reported the identification of a new SARS-CoV-2 variant, (Omicron-B.1.1.529), to WHO. B.1.1.529 was first detected in specimens collected on November 11, 2021, in Botswana and on November 14, 2021, in South Africa.

December 1, 2021: The first confirmed U.S. case of Omicron was identified.

December 18, 2021: Omicron has quickly become the dominant strain in the U.S., accounting for 73.2 percent of all new infections. (Surpassing Delta stain).

Viral Characteristics

The spike protein of the Omicron variant is characterized by at least 30 amino acid mutations. Notably, 15 of the 30 amino acid substitutions are in the receptor-binding domain (RBD). The primary target of vaccine-induced immunity and monoclonal antibody treatment.

These mutations are known to lead to increased transmissibility, higher viral binding affinity, and higher antibody escape.

Shorter Incubation Period: (exposure-to-symptom gap)

Omicron may have an average incubation period of only three days, shorter than any variant yet. (Was 5-6 days for the original strain, 5 days for the alpha variant, and 4 days for delta). Incubation periods might differ by vaccination status, underlying health conditions, infection history, age, and the amount of viral load.

"Does the COVID Vaccine Protect Against Omicron?"

Omicron variant is dangerous for those who have not been vaccinated yet says WHO director Tedros. Overwhelming majority of hospitalizations are unvaccinated. In Africa, only 14 % received the vaccination. World records 50,000 deaths per week. Because of data from other countries "precautionary doses" make sense even in the absence of evidence from India on waning vaccine effectiveness. But we should also be establishing systems and prospective studies to monitor infections in both the vaccinated and boosted. In the evidence that boosters in the elderly and those otherwise at high risk will provide the greatest decrease in severe disease and death in parts of the world, if doses and vaccinations are constrained, which is why precautionary doses make sense here, even in the absence of evidence from India on waning vaccine effectiveness.

Preliminary data show that the antibodies from a three-dose course (including booster) of mRNA vaccines neutralize Omicron.

Despite a notable drop in neutralizing antibody titers (vaccine protection of two doses wanes substantially within 21 weeks), their effectiveness against severe disease and death might be retained (probably because even modest levels of neutralizing antibodies may protect people from severe and this efficacy might be more dependent on T-cell immune responses than antibodies).

The third/booster dose of vaccination offers substantial additional protection against the risk of symptomatic COVID-19 for Omicron when compared to ≥ 25 weeks post second vaccine dose.

Omicron variant neutralized by a booster dose of COVID vaccine: Study

A study, supported by the European Union's Health Emergency Preparedness and Response Authority (HERA), was conducted to determine the efficacy of therapeutic antibodies and the antibodies developed in individuals previously infected with COVID-19 or vaccinated

people, in neutralizing the Omicron variant. Scientists assessed the sensitivity of Omicron to antibodies compared with the Delta variant.

"Precaution dose Will Be third Shot of the same vaccine: NITI Aayog On Covid Booster Shot"

The Union government has announced that it will not mix covid vaccines when administering booster doses. Precautionary the covid-19 vaccine dose will be the same vaccine as has been given previously, said V K Paul. Everyone qualifying for booster dose will need to have completed nine months. Since the second dose.

Common Cold may Provide Protection against COVID-19: Study

High levels of T-cells from common cold coronaviruses can protect against COVID-19, suggests a study from Imperial College London. The study was started in September 2020 and evaluated the levels of cross-reactive T-cells which were produced by prior episodes of common colds in 52 household contacts of positive COVID-19 cases shortly after exposure. Investigators assessed if they would develop an infection.

"Omicron is spreading like fire"

US register record high of 1.1 million COVID cases in a day

The United States broke the global record of daily COVID-19 cases with at least 1.13 million cases recorded on Monday, as per a Reuter's report, as the highly contagious omicron variant surged across the country. The previous record was 1.03 million daily new cases, reported on January 3. Despite being reported as a less severe variant of coronavirus, Omicron has driven hospital admissions to a record high in the United States.

Record number of 80,000, Covid--19 cases hit daily in Germany. Germany is assessing the reliability of lateral flow tests. (Rolf Apweiler, Director European bioinformatics institute. Chancellor Schulz backs calls for a vaccine mandate. Spain's health care system struggling with the omicron wave reported by Nicole Ris. The Omicron wave in Spain puts the health care system under pressure.

Half of Europe to be infected with Omicron within weeks says WHO

The World Health Organization (WHO) has warned that half of Europe is going to get infected with the Omicron variant within the next six to eight weeks. Dr. Hans Kluge stated

that a 'west-to-east tidal wave' of Omicron infection was sweeping across the region. The projection has been made on the basis of the seven million fresh infections reported across the European region in the first week of 2022.

"How Is Omicron Impacting Kids With comorbidities."

United States break the covid hospitalization record. Over 132,000 hospitalization reported. Omicrons effect on children with comorbidities. In USA kids hospitalization rate surged. 4 in 100000 youngsters were hospitalized. More than 31 kids were hospitalized in Delhi. The symptoms are high fever, throat pain, motions, vomiting, body ache, running nose.

When will omicron end?

Is the acute omicron wave may be ending soon? Parts of South Africa witnessed a decline in covid cases. A peak in hospitalizations was half of the previous waves. Admissions to ICUs drop from 4.3 to 1 %.

Omicron Variant Pushing COVID Out of Pandemic Phase: EMA

The spread of the Omicron variant is pushing COVID-19 towards becoming an endemic disease that people can live with; however, it continues to remain a pandemic at present, said EU's drug regulator. The European Medicines Agency (EMA) is doubtful about giving a fourth vaccine dose to the general population and said that repeated boosters did not seem to be a sustainable approach. Marco Cavaleri, head of the vaccine strategy at the agency, said.

Is omicron lethal for kids?

High-grade fever, severe body aches in children. Fortunately, they are getting better in 2-3 days. Children are more vulnerable to infection. Omicronis are three times more infectious than delta. Now the cases are declining. Adults are not symptomatic compared to kids.

U S Hospitalization due to omicron infection

U S Hospitalizations due to omicron infection have increased 33% to 40% said CDC Director, Dr. Rochelle Wallensky. CDC expects cases to peek in the coming weeks. The Omicron variant drives up cases in the US.

"New variant after Omicron: 'IHU' discovered by French scientists"

It is possibly linked to Cameroon. Researchers say that it contains 46 mutations, which may make it more resistant to vaccines, say experts. 12 cases reported near France's Marseilles. Could be more transmissible than omicron.

The next covid variant might be a triple whammy

Omicron is bad yet it could be worse. However next variant may not be as kind, as there is a chance, the next villain is a nightmarish triple whammy. Focussing on omicron, this variant raised flags because of mutations. Yet, it is not the worst variant ever. The reason is low death rates linked to this variant. This is also a puzzle to scientists. The SARS Co-V -2 B.1.1 529 omicron causes attenuated infection in mice and hamsters. These animals are infected by omicron or one of the earlier variants. Those infected with omicron had less lung damage, were likely to lose weight, and were less likely to die. Since the variant does not reach the lungs, where maximum damage can happen, symptoms were more likely to be mild. Dr. Stephanie James at Ragis university, Colorado, told the Daily Beast.

Risk of transmission of Covid-19 in hospital staff cafeterias

Sitting side-by-side in a cafeteria, particularly when the diners are not conversing with each other, reduces the risk of transmission of SARS-CoV-2 during meal times, says a recent study from South Korea published in the Journal of Korean Medical Sciences. The study investigated the risk of transmission of SARS-CoV-2 among HCWs in the staff cafeterias of a tertiary care hospital in Seoul, South Korea from January 2020 through September 2021.

80% of the genome--sequencing tests from with BA.2

Nearly 80% of Covid positive samples sent for genome sequencing by laboratories in Calcutta have been found to contain the B A.2 sub-lineage of the omicron variant nicknamed the "Stealth version" as it can't be detected by RT-PCR. Interestingly almost all those found infected with B A .2 had no intermediary history of foreign travel. The other sub-lineage B A .1 has been detected in those who have traveled abroad in the recent past said a senior health official. From the original B1.1.529 variant first detected in South Africa. Omicron is now split into B A.1, BA.2, BA.3 B A.3 not identified in India so far. In Maharashtra and some other states, BA.1 is dominantly circulating.

Immunity

Memory B cells are one of those layers, cells that live for years in the bone marrow, ready to swing into action and produce more antibodies when needed. But first, those memory cells get trained in immune system boot camps called germinal centers, learning to do more than just make copies of their original antibodies.

In a new study, Ellebedy's team found Pfizer vaccinations rev up "T helper cells" that act as the drill sergeant in those training camps, driving the production of more diverse and stronger antibodies that may work even if the virus changes again. (Hindustan Times, January 2022)

The immunity after COVID-19 infection or after vaccination lasts for about nine months, said the director-general of Indian Council of Medical Research (ICMR), Dr. Balram Bhargava, as he cited evidence from several global and Indian studies. Dr Bhargava said that evidence also indicates that a strong response was mounted through hybrid immunity which developed among people who were vaccinated after recovering from natural COVID-19 infection.

The immunity is confirmed by the Covid-19 vaccine particularly to prevent infections falls over time. Common cold protects against covid. People with higher levels of T cells common cold coronaviruses are less likely infected.

Molecular Tests:

rRT-PCR, TrueNat, CBNAAT, CRISPR, RT-LAMP, Rapid Molecular Testing Systems, Newer SARS-CoV-2 Omicron or variant detection rRTPCR assays

Who may be tested?

1. Symptomatic (cough, fever, sore throat, loss of taste and/or smell, breathlessness, and/or other respiratory symptoms) individuals. 2. At-risk contacts of laboratory-confirmed cases. [At-risk contacts are elderly (>60yr) and individuals with comorbidity such as diabetes, hypertension, chronic lung or kidney disease, malignancy, obesity, etc]. 3. Individuals undertaking international travel (as per country-specific requirements). 4. International travelers arriving at Indian airports/seaports/ports of entry as per laid down guidelines.

People who need not be tested:

1. Asymptomatic individuals in community settings

2. Contacts of confirmed cases of COVID-19 unless identified as high risk based on age or comorbidities
3. Patients who stand discharged as per home isolation guidelines
4. Patients being discharged from a COVID-19 facility as per revised discharge policy
5. Individuals undertaking inter-state domestic travel

Ancient science needs to be put to modern tests

If a variant is circulating at 0.1% frequency, there is a >99% chance that it will be detected in CDC's national genomic surveillance system.

Two types of tests are used to test for current infection: The gold- standard PCR -nucleic acid amplification tests (NAATs) and Less reliable Rapid antigen tests.

The CDC 2019-Novel Coronavirus (2019-nCoV) Real-Time RT-PCR Diagnostic Panel and the Multiplex Assay for Flu and SARS-CoV-2 are expected to detect the Omicron variant.

Changes in the viral genome can result in changes to viral proteins and, therefore, can also impact the performance of an antigen or serology test.

Rapid antigen tests (like Abbott BinaxNOW and QuidelQuickVue antigen tests) can detect the omicron variant. Timing is critical for rapid tests.

Rapid antigen tests are generally less sensitive and less likely to pick up very early infections (False negative) than PCR-molecular tests for any variant. Since Omicron multiplies so quickly and is so transmissible—and these tests provide only a snapshot in time—you could test negative in the morning and positive by the afternoon. PCR-molecular test – more sensitive/specific, but results take days and are currently short supplied.

If infection due to COVID-19 is still suspected after receiving a negative Rapid antigen test result consider repeat/follow-up testing with another rapid test, waiting at least 24 hours between each one, or get a PCR test.

Rule out Influenza, RSV and other common cold viral infections as these may cause similar symptoms and may co-infect along with COVID.

How long does the Covid-19 virus last inside the body?

Researchers are still trying to understand why covid-19 patients suffer weeks or months after they first got sick. It is because some of the coronaviruses stick around in their tissues. Scientists assess how long the germs continue inside the body. Sometimes cause false positive on diagnostic tests. It is important to understand covid-19 persistence. The PCR test reveals the disease is recent or chronic. Dr Andrew Karaba, infectious disease specialist at John Hopkins University explained even when the virus is no longer infectious, there is a period of time when you can still detect its RNA. The culture is difficult. The CDC advises SARS CoV-2 virus should only be isolated and studied in secured laboratories with a biosafety level of 3 or higher.

ANTIVIRAL DRUGS

Remdesivir, Favipiravir, Ivermectin, Ivermectin, Corticosteroids, and Monoclonal Antibodies like Tocilizumab (TCZ), and Itolizumab, etc. are recommended. Immunosuppressants that are under trial include Anakinra (AKR) which acts on endogenous elevated IL-1 levels in patients with COVID-19.

Plasma therapy -Plasma from an individual who has recovered from COVID-19 with high titers of neutralizing antibodies has been proposed as a novel therapy for COVID-19. Although there is a theoretical risk of antibody enhancement and transfusion-related reactions, this therapy is otherwise considered safe.

Antiviral Therapy Update: The combined treatment of Molnupiravir and Favipiravir results in a potentiation of antiviral efficacy in a SARS-CoV-2 hamster infection model

Orally available antivirals like Favipiravir and Molnupiravir have shown their antiviral activity against SARS-CoV-2. Their efficacy has been reported in COVID-19 patients, recently. A study reported the combined antiviral effect of the aforementioned drugs in a SARS-CoV-2 Syrian hamster infection model, where the infected hamsters were treated twice daily either with the vehicle (the control group) or a suboptimal dose of each antiviral or a combination of antivirals.

Patients with flu-like symptoms recover faster with paracetamol.

Doctors are no longer using broad-spectrum antibacterials such as doxycycline, azithromycin, and ivermectin, which were rampantly used during the first and second waves. Most are

recovering faster within three days. Their fever goes immediately within two days of paracetamol, taken twice a day.

Coronavirus loses the ability to infect after 20 minutes in the air, says a study

Coronavirus loses 90% of its ability to infect us within 20 minutes of being in the air and most of the loss takes place within the first five minutes, suggests the world's first simulations of the virus' survival in exhaled air. The findings from the study again emphasize the significance of short-range transmission of COVID-19, and the importance of physical distancing and mask-wearing as the most effective ways to prevent infection reported by The Guardian.

WHO called covid booster a scandal.

Describing covid booster shot a scandal. WHO called for the practice to be stopped. WHO chief said that more people receive booster doses than those receiving primary doses. DrTedros reiterated that only immunocompromised people should be administered booster doses. The report suggests that 36 countries are currently administering booster doses.

Management

- Home Isolation
- Mask, Face cover, etc
- Hand hygiene
- Symptomatic management
- Regular contact with the physician
- Ivermectin (200 mcg/kg once a day for 3 to 5 days)
- Inhalational Budesonide

CONCLUSION

The omicron variant is spreading across the globe. But so far the strain appears to be less deadly than its predecessors. To minimize the risk, policymakers must tolerate the rapid spread of milder variants. This will require difficult trade-offs, but it will save lives in the

long run. Omicron is escalating very fast across the universe and vaccine breakthroughs are associated with this new variant. Initial data recommend that vaccines offer protection against hospitalization from Omicron infection. The mRNA vaccine is largely effective in neutralizing antibody activity against all circulating variants. Vaccination is the safest and most effective defense against severe complications of COVID-19, regardless of which variant is circulating.

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