

Review Article

Title: OMICRON: A NEW RISE TO EPIDEMIC

Running Title : OMICRON VARIANT : WHAT WE KNOW AND WHAT WE NEED TO KNOW

ABSTRACT:

It is been two years to the Emergence of Deadly Plague Covid:19 Pandemic, causing over 5.57 million death cases worldwide. However the World continues to suffer in the hands of COVID-19 as the new variant after alpha, beta, gamma , delta and now Omicron continues to spread. Omicron was first identified in Botswana and South Africa in November, since then it has surged around the world over the past few weeks, faster than any of the previously known variants of coronavirus. Omicron has turned out to be highly transmissible and less susceptible to vaccines than other variants.

Keywords: Omicron, Pandemic, Covid-19, Variant.

INTRODUCTION:

When compared to the original virus, Omicron had 50 mutations, many of which were known to induce major alterations in other versions. This aroused concern in the scientific community right away. The spike protein, which lies atop the viral particle and acts as a key to let it to enter human cells, was the focus of these studies. On November 26th, 2021, the World Health Organization designated

Comment [PMF1]: Revision needed
English language and phrases construction

Comment [PMF2]: More than 50
mutations and deletions

Comment [PMF3]: previous

Comment [PMF4]: viral body

Omicron as a "variant of concern," and since then, the variant has been found in more than 110 nations. A California citizen who returned home from South Africa was recognised as the first American infected with Omicron in early December. The Centers for Disease Control predicted that it accounted for 58 percent of all new infections in the United States by December 25, 2021. In many parts of the world, Omicron is swiftly gaining domination, demonstrating the potential that scientists saw when it was originally found. Omicron has mutations in common with the alpha, beta, gamma, and delta varieties, as well as those that are unknown. ¹

Comment [PMF5]: worldwide

Comment [PMF6]: recognized

BACKGROUND:

Unlike all earlier variations, which penetrate human cells by merging with the cell membrane, causing severe illness and facilitating virus transmission from cell to cell. Omicron, on the other hand, is encased in a capsule and injected into the cell by the cell membrane. Before it can divide and infect new cells, it must escape from this capsule with the help of other proteins in the cell called cathepsins. Omicron appears to favour infecting cells in the nose and is less likely to infect cells in the lungs. Vaccines targeting Omicron would most likely be the greatest method to boost our protection against this new variety (and other variants that have not yet evolved). ²

Comment [PMF7]: SARS-CoV-2 VOCs

Comment [PMF8]: utilizing ACE2 and TMPRSS2 for entry into cell

Comment [PMF9]: uses ACE2 to enter cells to a greater extent than any other SARS-CoV-2 variant. SARS-CoV-2 Omicron induces the formation of syncytia

Comment [PMF10]:

Comment [PMF11]: prefer cell infection

SYMPTOMS OFOMICRON VIRUS:

- Omicron less likely causes loss of taste and smell compared to other earlier variants.
- Omicron often develop a scratchy or sore throat along with nasal congestion, a dry cough and muscle pain, especially low back pain.

Symptoms usually last for a couple of days followed by quick recovery.

ROLE OF VACCINES AGAINST THE VARIANT:

Several studies have found that full COVID vaccination plus a booster dose provides excellent protection against Omicron infection. Two doses of a vaccine like Pfizer-or BioNTech's Moderna's, on the other hand, provide substantially less protection without a booster. (However, two doses of a vaccine appear to protect against severe Omicron sickness.) Scientists took blood from persons who had been properly vaccinated and combined it with Omicron in a petri dish containing human cells. Every vaccination tested so far has performed worse than previous variations at neutralising Omicron. And antibodies from people who received two doses of the AstraZeneca or one dose of Johnson & Johnson vaccines don't seem to do anything at all against Omicron. But when researchers tested antibodies from people who had received boosters of Moderna or Pfizer-BioNTech vaccines, they saw a different picture. Boosted antibodies blocked many Omicron viruses from infecting cells. Researchers found a similar response when they looked at people who had been fully vaccinated with two doses after a Covid-19 infection: Their antibodies were extremely potent against Omicron. Antibodies from persons who got two doses of the AstraZeneca vaccine, or one dose of the Johnson & Johnson vaccine don't seem to work against Omicron at all. Researchers discovered a different picture when they evaluated antibodies from persons who had received boosters of Moderna or Pfizer-BioNTech vaccines. Antibodies that had been raised stopped numerous Omicron viruses from invading cells. When researchers looked at persons who had been fully vaccinated with two doses following a Covid-19 infection, they discovered that their antibodies were particularly effective against Omicron. Researchers in the United Kingdom discovered that persons who received two doses of the AstraZeneca vaccine had no protection against Omicron infection six months after vaccination. The effectiveness of two Pfizer-BioNTech dosages was only 34%. A Pfizer-BioNTech booster, on the other hand, was 75 percent effective against infection. The findings of these experiments are backed up by real-world studies. Researchers in South Africa discovered that two doses of the Pfizer-BioNTech vaccine were only 33% effective against Omicron infection. They discovered that it is 80 percent effective when compared to other variations.³

Comment [PMF12]: Modify completely the text

Comment [PMF13]: variants

Comment [PMF14]: Change completely the text: this is not true. Astra Zeneca and J&J are less effective.

Comment [PMF15]: Less effective

Comment [PMF16]: The scientific language is worst. Complete revision needed

Comment [PMF17]: variants

EFFECTS OF OMICRON CAUSED COVID VIRUS CASES:

While Omicron infections can be fatal in some cases, they are generally less severe than the Delta form. Scientists assess a coronavirus variant's severity by looking at how many persons infected **with it end up in the hospital**. The Delta variation was shown to be significantly more severe than previous variants.

Comment [PMF18]: are hospitalized, mainly in ICU.

Omicron, on the other hand, is the polar opposite. According to a British study, the probability of Omicron-related **hospitalisation** is half that of Delta. Hospitals noticed the same lowered danger when the Omicron version became popular in the United States. Despite the fact that there were more new cases than ever before, new hospitalizations increased at a far slower pace. Although it's a relief that Omicron isn't as severe as Delta, the new variant's extreme contagiousness might put hospitals under a lot of strain.

Comment [PMF19]: hospitalization

OMICRON EFFECTS AND CHALLENGES IN COMING MONTHS:

Researchers are developing mathematical models to predict what will happen to Omicron in the coming months. These models must, by necessity, be founded on assumptions about the variant, which may need to be revised as new evidence becomes available. However, scientists have already discovered that Omicron is highly contagious and adept at avoiding immune systems. Even if Omicron proves to be milder than other types, hospitals may be pushed to their limits. Although a reduced percentage of Omicron cases may require **hospitalisation**, there will still be more seriously ill patients to treat if the number of Omicron cases is significantly higher than in past surges. In the United States, those Omicron instances will be added to the Delta variant's already high levels of hospitalizations. On Dec. 22, a group of **modellers** who manage the Covid-19 Scenario Modeling Hub released a statement stating that the writing was already on the wall as they fine-tuned their estimates.

Comment [PMF20]: hospitalization

Comment [PMF21]: modelers

CHANCES OF REINFECTION WITH THE VARIANT:

Omicron's propensity to cause reinfection is one of its most notable characteristics. Previous infection with SARS-CoV-2 provided more than 80% protection against reinfection in studies conducted before the introduction of omicron, with a 0.1 percent–1% chance of reinfection.⁴ One may argue that the omicron reinfection rate was higher because natural immunity established through earlier infections was diminishing when omicron attacked. This notion is refuted by data from the United Kingdom, where both delta and omicron are circulating at the same time. It has been found that omicron has a 6 times higher risk of reinfection than delta. Although a previous infection provided 80% protection against delta, it only provided 19% protection against omicron.⁵ On the plus side, while omicron reinfections are prevalent, they were linked to a 61% lower risk of hospitalisation in the UK when compared to first omicron infection. This suggests that, while previous infection may not be powerful enough to prevent infection, it does reduce the severity of the disease, similar to vaccine-induced immunity.

Comment [PMF22]: Scientific English language needs a substantial correction

CONCLUSIONS:

Omicron has taken over the globe. Pakistan records 7,678 new COVID-19 infections in the month of January and 23 deaths from coronavirus; total deaths reaching upto 29,065.⁶ The virus spreads more quickly and is better at evading natural and vaccine-induced immunity than previous versions. Despite the lower severity, due to the sheer number of cases and indirect consequences on the global economy, the public health impact can be significant. While booster immunizations have been used in many privileged countries to restrict the spread of this type, the effectiveness of this technique is questionable. Time will tell if omicron will write another bloody chapter in the pandemic's history or whether it will bring the pandemic to a close by replacing the more ferocious variants.⁷

Comment [PMF23]: Is worldwide diffused

Comment [PMF24]: up to

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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