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SARS- COV- 2 Omicron Variant, an emerging threat of third wave and its consequences: A Review

*** Ajaz Ahmed Wani and **Tania Mahajan, *** Shaista Ajaz**

*Head Department of Zoology ,Govt Degree College Doda,Jammu and Kashmir-182202
Email: aahilajaz@gmail.com,phn 9797588390
** Govt.College for Women Udhampur (J &K)

Abstract

Recent emergence of the SARS - COV-2 variant as Omicron(B.1.1.529) has become a global problem .This variant was first reported from Africa on 24th Nov.2021.Prelimnary data suggest there are increasing rates of hospitalization in South Africa ,but this may be due to increasing overall numbers of people becoming infected rather than a result of specific infection with Omicron.It multiplies around 70 times faster than the previous delta variant and is less severe .This variant got evolved due to wide circulation of virus and numerous infection .The mutation has been reported in the spike protein and is a concern of surpassing vaccine immunity .This short review article throws light on the virulence of Omicron mutation and its consequences.

Key Words : Omicron, SARS-COV-2, South Africa,World,mutation,evolution,vaccines.

Introduction:

Since after the emergence of Covid- 19 in China ,a number of variant of Coronavirus emerges througout the world in the form of Alpha B.1.1.7, Beta B.1.351,Delta -B.1.617.2 and now Omicron - B.1.1.529 as reported by the world health organisation(WHO) . The Omicron Variant (B.1.1.529) was reported to World Health Organisation from South Africa on 24th Nov.2021[1]. It multiplies around 70 times faster than the previous delta variant in the respiratory tract and is less severe than the delta variant strain[2] . This variant is less capable to penetrate deeper into the lung tissue [3] and as a result are less fatal than the delta variant therefore less risk of hospitalization [4] .It has been observed that this variant even infect the person with doses of vaccines and its ability to evade the body's immune system ,means the total numbers of patients requiring hospital care at any given time is still of great concern[3].

However vaccine continue to provide protection against severe disease and hospitalization especially third booster dose of an mRNA vaccine [5] . But early figures suggest that double vaccination offers 30-40 / protection against infection and around 70/ protection against hospitalization. The third dose of vaccine boosts effectiveness against infection to avoid 75/ and 88/ for severe disease [6] . The name Omicron was named after the fifteenth letter in the Greek alphabets .This variant emerges because of mutation in the spike protein reducing the ability for Covid-19 vaccine to prevent symtomatic disease [7]. The mutation in the spike protein is related to increased infectivity and antibody evision .Computational modelling suggest that the variant may also escape cell mediated immunity [8] .The mode of transmission via formites is rare ,the Prelimnary data suggest that variant last for approximately 194 hours on plastic surfaces and on skin

for about 21 hours compared with just 56 and 7 hours respectively for the strain originated in Wuhan strain [9].

Virulence:

The rapid rise of Omicron variant infections around the world after its ist report from South Africa in Nov.2021 has led the scientist of virological community to observe this extremely infectious strain closely.Initial data indicates that Omicron is far more transmissible than strains that came before.One study estimates that Omicron is 2.7 to 3.7 times more transmissible than the Delta variant among vaccinated individuals .According to Director General of World Health Organisation ,Omicron is still a cause of concern in the unvaccinated individuals d should not be taken lightly ,as it seems that this variant appears to be less severe compared to delta variant ,but it does not mean that it should be catagorised as mild. According to Garrett et al [10] Omicron propogate extremely rapidly in the nasophyrnx more so that the strain that came before, besides it transmit from asymptomatic individuals at a much higher rate than previous strain.The Delta variant transmit among asymptomatic individual between 1/ to 2.6/ whereas Omicron is over 30/ Although Omicron has higher immune escape ability than the existing variant , there is no clear indication of increased severity .There is currently no clear evidence for increased virulence or lethality for Omicron .The higher ability for immune escape may be a likely reason for the recent surge in Omicron cases , the study based on computer analysis .The study was published in preprint online server Med Rx1v .According to the study Omicron bears more sequences variation , especially in the spike protein and host receptor binding motif..

Symptoms :

Omicron multiplies about 70 times faster than the Delta variant in the respiratory tract .The prominant symptoms of Omicron variant is night sweats,loss of taste and smell [11] .However study conducted in Dec.2021 by the Centre for Disease Control found that the common symptoms reported are cough ,congestions ,fatigue and running nose make it difficult to distinguish from symptoms of cold flue ,sneezing and snore throat [12].

Consequences:

As the new variant Omicron have large number of mutation and WHO is concerned that such mutation may reduce immunity in people previously infected and in vaccinated .It has also observed that this variant is more infective than the prior variant.However effects of mutations if any are unknown as of late Nov.2021 .WJO is of concern that countries with low vaccination rates have maximum possibility of deaths due to co morbidities because of this variant and urges all nation to increase Covid -19 vaccination [13]. Paul Morgan (immunologist) at Cardiff University recommended the vaccination on the priority. According to Morgan blunting rather than a complete loss of immunity is most likely the outcome the virus can not lose every single epitope on its surface because of mutation in the spike protein so while some of the antibodies and T- cell clones made against earlier version of the virus or against the vaccine may not be effective ,there will be others which remain effective.

On 15th of Dec.2021 the European Centre for Disease Prevention and Control assessed that even if the variant turns out to be milder than Delta ,its spread will very likely increase hospitalization and fatalities due to exponential growth in cases caused by increase transmissibility [14].On 23rd Dec.2021 it was mentioned in Nature though Omicron likely weakens vaccine protection ,but reasonable protection against Omicron may be maintained with vaccine and boosting doses[15].

Evolution of Omicron:

Due to the wide circulation of virus and numerous infection , the possibility of virus mutation increases.The more opportunities the virus spread ,the virus spread ,the more chances it has to undergo change .Therefore new variant like Omicron are a reminder that the Covid -19 pandemic is far from over.It is therefore important to vaccinate people and continue to follow existing SoPs on preventing the spread of the virus which includes wearing masak,regular handwashing ,physical distancing and keeping indoor well ventilated.

Conclusion:

The emergence of the Omicron variant in South Africa poses a threat to the world have the increased ability to infect previously infected individual .Although the virulence of this strain is mild , but have the high transmission rate .Omicron escape vaccine immunity has important implication world wide ,quantifying the extent of Omicron of immune escape for both natural and derived immunity as well as it's transmissibility relative to other variant and impact on disease ,severity are urgent priorities to inform facility readiness planning and other public health operations.

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