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Short Communication

COVID-19 Omicron variant and low immunity after vaccination

Corresponding Author:
Batool Mutar Mahdi, University of Baghdad, Al-Kindy College of Medicine

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ABSTRACT:
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or known as COVID-19 has spread all over the world as a new mutant variant of Omicron (B.1.1.529) that spread worldwide causing a high surge of new infections with serious illness in some area of the world. In addition to that, whether the current COVID-19 vaccines could effectively resist reinfection with the new strain. This antibody resistance was due to SARS-CoV-2 mutations on the spike (S) protein receptor-binding domain (RBD). Omicron is about ten times more transmissible than the original virus or about twice as communicable as the Delta variant. Three-dimensional structures of antibody-RBD complexes showed that Omicron was twice more likely to escape present vaccines than the Delta variant.

Keywords: COVID; vaccine; immunity.

Omicron(O) is one of the severe acute respiratory syndrome- Corona virus-2 (SARS-CoV-2) B.1.529 variants that was reported on November 25- 2021, from South Africa and Botswana (1). It is characterized by fever, cough, dyspnea, and hospitalization in advanced and critical stages (2,3,4). It is heavily mutated in the antigenic epitopes of spike glycoprotein (S gene dropout or target failure) that may alter the affinity of this virus to ACE2 receptors and rapidly transmitted than Delta type and partial resistance to vaccine induced antibodies and therapeutic monoclonal antibodies that are used in treatment by evading these neutralizing antibodies (5). It may be hypothesized that Omicron may evades memory T helper cells (CD4+) due to altered and changing spike glycoprotein. Th cells assists in activation of naïve B cells to produce antibodies by somatic hypermutation and class switching recombination and in addition to that Th cells helps in lysing virus infected cells by T cytotoxic cells (CD8+) cells (6). Original Antigenic Sin (OAS) might downside of immunologic memory and explains humoral memory immune response generates antibodies against one group of spikes antigens can affect the nature of antibodies that produced against infection or vaccination that had similar but not identical sets of spikes antigens(7). Several cases of infections have been demonstrated after COVID vaccinations which were so high after vaccination due to low immunity generated by original antigenic sin or due to infection with a different original strain (Omicron) and the immune system produces antibodies against the original strain through high - affinity memory B cells that inhibit activation of naïve B cells ending with low immunity (8).

REFERENCES:

1- Kupferschmidt K. Where did 'weird' Omicron come from? Science. 2021; 374(6572): 1179.
2- Dawood H, Hwayyiz A, Ibrahim I, Abdul Rahman I. The clinical features of COVID - 19 in a group of Iraqi patients: A record review. JFacMedBagdad. 2021;63(1):8-12.
3- Mohammed IA, Ali AH, Al shenaty JN. Clinical course and disease outcomes in hospitalized patients with 2019 novel corona virus disease at Ibn- Al Khateeb Hospital in Baghdad, Iraq. JFacMedBagdad. 2020 ; 8 :62.
4- Allawi JS, Abbas HM, Rasheed JI, Sulaiman TI, Gatea AA, Al-Lami F, Al-Diwan JK, Al-jabory AM, Waheeb M, Abdurudha YI, Al-Kaabi LS, Al-Shuwaili SJ, Tawfeeq TW, Alabboodi MK, Abdulrazak AA, Al-Samak WQ. The first 40-days experience and clinical outcomes in the management of coronavirus covid-19 crisis. Single center preliminary study. JFacMedBagdad . 2020 ; 16 :3-4
5- Ali F, Kasry A, Amin M. The new SARS-CoV-2 strain shows a stronger binding affinity to

ACE2 due to N501Y mutant. Med Drug Discov. 2021; 10:100086.
6- Saxena SK, Kumar S, Baxi P, Srivastava N, Puri B, Ratho RK. Chasing COVID-19 through SARS-CoV-2 spike glycoprotein. Virus Disease. 2020; 31: 1- 9.
7- Brown EL, Essigmann HT. Original Antigenic Sin: the Downside of Immunological Memory and Implications for COVID-19. mSphere. 2021;6(2):e00056-21.
8- Vashishtha VM. Is 'original antigenic sin' complicating indian vaccination drive against Covid-19?. Hum Vaccin Immunother. 2021;17(10):3314-3315.