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Emergence BQ.1 and BQ.1.1 as newly identified omicron subvariants: current scenario and future outlook – an update

Shopnil Akash, M. Pharm[a,*], Md. Rezaul Islam, M. Pharm[a], Kuldeep Dhama, PhD[b,*]

Dear Editor,

In the last couple of years, the Omicron variant has emerged as the deadliest among coronavirus disease 2019 (COVID-19) variants, and as a result, it has granted rise to several subvariants. According to statistics provided by the Centers for Disease Control and Prevention (CDC), two of the most common subvariants, BQ.1 and BQ.1.1, are now suspected for the vast majority of COVID-19 occurrences that have been reported in the United States. Infectious disease specialist Dr Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, has expressed skepticism regarding BQ.1 and BQ.1.1. Dr Fauci told the CBS News that the subvariants have characteristics with the potential to reduce the efficacy of our traditional therapies as well as our immunity. Besides, these two variants may cause patients to get a severe illness or even drive to death[1].

According to Thomas Russo, professor and head of infectious disease at the University of Buffalo in New York, BQ.1 and BQ.1.1 are part of a new assault of COVID-19 variations. He describes this as the 'next wave' in the conversation. 'BQ.1, BQ1.1, and these other novel variations have all developed in separate areas; but, to some extent, they contain identical spike proteins that make them at least as infectious as the parental variants that they were generated from.' According to Dr Russo's explanation, BQ.1 and BQ.1.1 are subvariants of the Omicron account for the majority of COVID-19 cases. He refers to them as 'first cousins,' pointing out that they are pretty similar. Both BQ.1 and BQ.1.1 have rapidly disseminated. Previously, they were included together in CDC data under BA.5, but since the number of reported cases kept climbing significantly, they were moved to their section on the 'Nowcast' COVID-19 data tracker on the CDC website. Each week, statistics from the CDC reveal an increase in COVID-19 cases caused by BQ.1 and BQ.1.1 and a decrease in patients affected by BA.5[1].

The combined monoclonal antibodies tixagevimab and cilgavimab (Evusheld) are utilized for pre-exposure prophylaxis against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Since about 20 January 2023, more than 90% of the circulating SARS-CoV-2 variants in the United States, particularly the Omicron BQ.1, BQ.1.1, XBB, and XBB.1.5 sublineages, are unlikely to be vulnerable to these antibodies. Since the combined lineage was first discovered on 8 February 2023, a total of 280 077 sequences that belong to the BQ.1* [Omicron (BQ.1.X)] combined lineage have been found[2,3].

Midway through July 2022 in Nigeria, the first BQ.1 and BQ.1.1 sublineages sequences were reported to GISAID (Global Initiative on Sharing Avian Influenza Data). Since then, these sequences have been documented in different countries, including Nigeria, the United Kingdom, Japan, the United States, France, Belgium, Denmark, and Italy[4].

Both BQ.1 and BQ.1.1 have mutations that can be found within the spike (S) protein. These variants are K444T, L452R, N460K, and F486V. Moreover, the mutation R346T.6 may be found in BQ.1.1. Based on the results of earlier comprehensive mutational scanning analyses, it has been hypothesized that several of these spike protein mutational sites are likely to result in antibody evasion. Not only do BQ.1 and BQ.1.1 share the spike (S) protein, but they also share the NSP12 protein (RNA-dependent RNA polymerase) mutation Y273H (also labeled as ORF1b: Y264H), and BQ.1.1 also carries the NSP13 protein (helicase) mutation N268S. These mutations can be found in BQ.1.1 (also annotated as ORF1b: N1191S)[4].

The symptoms associated with BQ.1 and BQ.1.1 seem to be the same as those associated with other COVID-19 variations. Tiredness, fever, cough, congestion, shortness of breath, sore throat, nausea, diarrhea, and muscular pains or headaches are some of the most prevalent symptoms. Loss of smell, formerly a characteristic of COVID-19 infections, is not nearly as frequent[5].

According to Pfizer, the revised booster, developed to target Omicron BA.4 and BA.5, also protects against the proliferation of Omicron subvariants such as BQ.1.1 and BQ1. According to a statement by Pfizer in a press release, adults aged 55 and older were found to have nine times the normal number of antibodies against BQ.1.1 one month after receiving the bivalent booster. People who received a second dose of the first vaccination exhibited a significant rise in the number of antibodies they had against BQ1.1[6].

[a]Department of Pharmacy, Faculty of Allied Health Science, Daffodil International University, Daffodil Smart City, Ashulia, Savar, Dhaka, Bangladesh and [b]Division of Pathology, ICAR-Indian Veterinary Research Institute, Bareilly, Uttar Pradesh, India

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*Corresponding author. Address: Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, Dhaka 1207, Bangladesh. Tel.: +880-1935567417, E-mail address: shopnil29-059@diu.edu.bd (S. Akash); Division of Pathology, Indian Veterinary Research Institute, Izatnagar 243122, Bareilly, Uttar Pradesh, India, Tel.: +880-1935567417. E-mail address: kdhama@rediffmail.com (K. Dhama).

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Fighting against SARS-CoV-2 has grown more challenging because Omicron/BQ.1 and BQ.1.1 have emerged. There is evidence in the form of a significant number of mutations in the spike protein that it has been changed day by day. As a result of the current COVID-19, vaccines are losing their effectiveness. So, the scientific community and global policymakers should be conscious of these new variants and take appropriate steps to stop the spread.

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Data availability statement

All data used to support the findings of this study are included in the article.

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