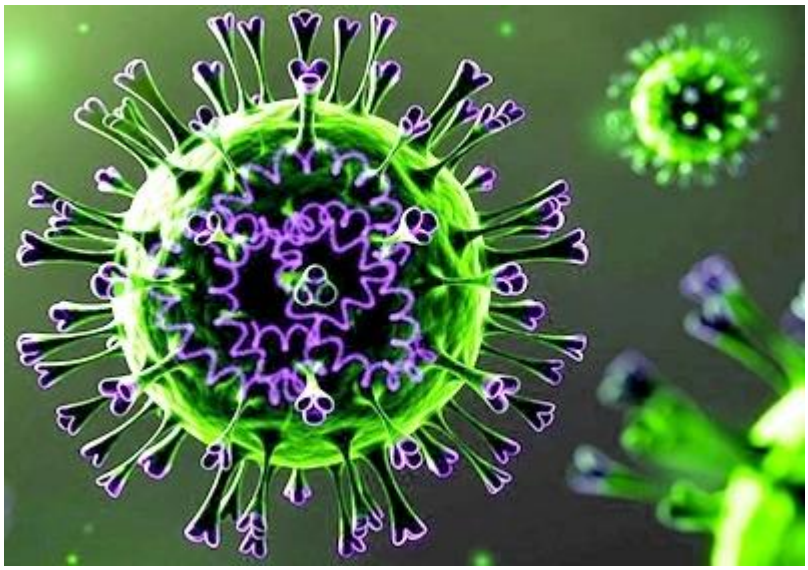
The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variant KP.2 (JN.1.11.1.2), a descendant of the JN.1 variant (BA.2.86.1.1), is rapidly spreading across several regions. In this study, the researchers from Japan investigated the virological characteristics of the KP.2 variant. They discovered an increased immune resistance of KP.2 and its ability to evade neutralizing antibodies to a greater extent than previous variants, including JN.1.



The authors stated that the JN.1 variant (BA.2.86.1.1), which arose from BA.2.86(.1), outcompeted the previous dominant XBB lineage at the beginning of 2024. Subsequently, the JN.1 diversified, resulting in the emergence of progenies with spike (S) protein substitutions such as S: R346T and S: F456L.

The KP.2 (JN.1.11.1.2) variant bears the S: R346T and S: F456L substitutions. Also, compared to JN.1, KP.2 has three substitutions in the S protein and one substitution in the non-S protein.

The researchers utilized a Bayesian multinomial logistic model to estimate the relative effective reproduction number (Re) of KP.2 using 72 genome surveillance data from the United States, United Kingdom, and Canada where more than 30 sequences of KP.2 have been reported. The results showed that the relative Re of KP.2 was 1.22-, 1.32-, and 1.26-fold higher than that of JN.1 from the United States, United Kingdom, and Canada, respectively. Since the effective reproduction number describes the potential of epidemic

spread of infectious agents, these findings suggest that KP.2 has a higher viral fitness and could become the predominant lineage worldwide.

According to the results of the pseudovirus assay, KP.2 has a significantly (10.5-fold) lower infectivity compared to JN.1.

However, the neutralization assays with monovalent XBB.1.5 vaccine sera and sera from breakthrough infection with XBB.1.5, EG.5, HK.3, and JN.1. demonstrated that the 50% neutralization titer (NT50) against KP.2 in all cases was significantly lower than that against JN.1. In particular, KP.2 showed the most significant resistance (3.1-fold) to the sera of those vaccinated with the monovalent XBB.1.5 COVID-19 vaccine who were not infected and those who were infected (1.8-fold).

According to the authors, the increased immune resistance of KP.2 partly contributes to its higher effective reproduction compared to previous variants, including JN.1.

This study was published in The Lancet.

Journal Reference

Kaku Y, Keiya U, Kosugi Y, Okumura K, Yamasoba D, Uwamino Y et al. Virological characteristics of the SARS-CoV-2 KP.2 variant. The Lancet, May 20, 2024. https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(24)00298-6/fulltext

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