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Correspondence

NeoCoV: A foresight of the next possible pandemic



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Dear Editor,

Unfortunately, the coronavirus disease 2019 (COVID-19) pandemic has held the world hostage for more than two years now. The etiological agent of COVID-19 is a novel coronavirus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is an enveloped positive-sense RNA. During the past two years, the efforts are underway to mitigate the COVID-19 pandemic via various means such as social distancing measures and vaccination. Several variants of parental viral strain (SARS-CoV-2) have been reported, including variants of concern (VOCs), namely Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1), Delta (B.1.617.2), Omicron (B.1.1.529) along with other variants of interest (VOIs) namely Epsilon (B.1.427/B.1.1429), Zeta (P.2), Eta (B.1.525), Theta (P3), Iota (B.1.526) and Kappa (B.1.617.1) [1–3]. Amid the containment of cases resurging due to the emergence of SARS-CoV-2 variants, scientists have highlighted the possible threats associated with NeoCoV in bats found in South Africa, which might have a high death and transmission rate. However, it is important to consider that NeoCoV has not yet been detected in humans and there are no reported human deaths associated with NeoCoV so far, but there is suddenly a chatter around NeoCoV while the world grapples with the COVID-19 pandemic. Many researchers have stated that NeoCoV is a close relative of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and should be monitored closely as its mutated form is likely to possess the potential to infect humans (Hindustan Times, <https://www.hindustantimes.com/cities/mumbai-news/neocov-scary-should-we-be-worried-about-this-new-variant-101643637029608.html>). The World Health Organization (WHO) has stated that further studies are required to ascertain NeoCoV's threat to humans. Hence, in this correspondence article, we will summarise any potential threat associated with NeoCoV. On Jan 28, 2022, the WHO has warned of a novel coronavirus i.e. NeoCoV, which has obtained its name from its host reservoir i.e. Neoromicia, the species of bat that has been infected by this virus. It is believed to be associated with MERS coronavirus but not with SARS-CoV-2 (WHO, https://cdn.who.int/media/docs/default-source/blue-print/covid-19-new-variants-meeting-report_20.03.2022.pdf?sfvrsn

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The dipeptidyl peptidase-4 (DPP4), which is the functional receptor found on the surface of cells in the airways (such as the lungs), is utilized by MERS-CoV and several related bat coronaviruses as an entry receptor [4,5]. However, the receptor for NeoCoV, the closest MERS-CoV relative yet discovered in bats, remains enigmatic [6]. One recent study, which is yet-to-be peer-reviewed, published in a preprint on the bioRxiv website [7] has reported that the NeoCoV and its close relative, PDF-2180-CoV, can use some types of bat angiotensin converting enzyme 2 (ACE2) and human ACE2 for its entry. According to the study, the NeoCoV virus uses its spikes' S1 subunit carboxyl-terminal domains (S1-CTD) for high-affinity and species-specific ACE2 binding. The researchers have discovered a molecular determinant near the viral binding interface that prevents the human ACE2 from promoting NeoCoV infection, particularly around the Asp338 residue [7]. NeoCoV, on the other hand, infects the human ACE2 expressing cells effectively following a T510F mutation in the receptor-binding motif (RBM) [7]. It has been postulated that the antibodies directed against the SARS-CoV-2 or MERS-CoV by natural infection or through vaccination will not be able to neutralize the infection caused by NeoCoV. In addition, it has been reported for the first time about the use of ACE2 by MERS-related viruses, highlighting a possible bio-safety risk posed by the human emergence of an ACE2-using "MERS-CoV-2" with a high death and transmission rate [7].

Furthermore, it has been suggested that if the NeoCoV acquires further mutations and infects human populations, it could evolve into "COVID-22". In comparison to the COVID-19, there is a chance that the symptoms could be three times more severe. Any outbreak induced by this virus strain could result in a thirty percent rise in fatality rate, similar to that of its relative MERS. In comparison to the COVID-19, which has killed 5.67 million people till date, COVID-22 might kill 17 million individuals. (Thaiger, <https://thethaiger.com/coronavirus/neocov-could-be-3-times-more-lethal-than-covid-19-if-it-gains-key-mutation-for-human-infection>).

All of these predictions, however, are preliminary, and it is critical to monitor any probable appearance of NeoCoV or spillover between animals and humans. Dr. T Jacob John, a virologist located in Vellore, has

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stated that there is no reason to be alarmed because bats and people do not come into touch naturally. "We should obviously keep an eye on novel variants and be cautious, but we should not panic." "Bats and humans do not have natural touch, and such contact only occurs in rare, unusual circumstances," stated Dr. John (Hindustan Times, <https://www.hindustantimes.com/cities/mumbai-news/neocov-scare-should-we-be-worried-about-this-new-variant-101643637029608.html>).

Many scientists have suggested to withhold the debate until a human case has been identified as there are not yet any serious concerns. There is a currently scarcity of information on NeoCoV and it is still unknown whether NeoCoV can transfer to people or spread over the globe. Hence, it is not easy to infer about the threats at this stage. In conclusion, several studies are required to understand this novel coronavirus and its immunology including the vaccines, if it exists in humans as it has only been reported in the animals so far. Furthermore, the COVID-19 pandemic has not been over yet, and there is an urgent need to ramp up vaccination in humans as well as animals [8], besides keeping an eye on other possible public health threats such as the NeoCoV as well.

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Declaration of competing interest

All authors report no conflicts of interest relevant to this article.

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