



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

Letter to the editor

COVID vaccination provided protection from severe disease despite low Cycle threshold (Ct) values



Keywords:
SARS-CoV-2
Coronavirus
Covid vaccination
Vaccine
Disease

Dear Editor,

Cycle threshold (Ct) is a value that emerges during Real-Time Reverse Transcription Polymerase Chain Reaction (RT-PCR) tests and is considered a gold standard for detecting SARS-CoV-2. The Ct value refers to the number of cycles taken to detect the virus. The lesser number of cycles taken implies a higher viral load and vice versa, and a high viral load (Ct score <30) is 'believed' to correlate with increased infectivity and severity of the disease [1]. However, there is still no conclusive proof for a direct correlation between the Ct values and the disease severity and infectivity. The Ct values differ from one test kit to another, with the method of sample collection and transport, the competence of a technician, calibration of the equipment, and analytical skills of the interpreter [1].

We have analyzed the RT-PCR samples of 118 symptomatic COVID-19 healthcare workers (HCWs) at Indraprastha Apollo Hospitals, New Delhi, between 31st March to May 8, 2021 (during the 2nd wave in India) [2,3]. We checked their Ct values and lineage of SARS-CoV-2 by Genome sequencing (done at the National Centre for Disease Control, New Delhi) from their nasopharyngeal samples. The majority (72.9%) of them had Ct values of <30, indicating a high viral load, and the Delta variant (B.1.617.2 lineage) was the most prevalent at 68.6%. This high incidence coincided with the substantial presence of the Delta variant in our population during the study period [4]. All of these HCWs were pre-vaccinated with ChAdOx1 nCoV-19 Recombinant vaccine. None of them required ICU admission, and there were no fatalities. Only two required hospital admission for a short duration.

Despite low Ct scores and high prevalence of a Delta variant in the majority of the HCWs were escaped from severe disease because they were vaccinated and a younger cohort (without significant comorbidities) [5]. Our experience of the COVID-19 cases admitted in the ICU has shown that the majority of them were older (>50 years), had comorbidities, and were not vaccinated, predisposing them for severe SARS-CoV-2 infection [6]. These

observations suggest that the COVID-19 vaccines have a protective effect from a severe disease despite the presence of these adverse factors.

We believe that the severity of COVID-19 is dependent on the host factors, apart from the pathogen. The Ct values only provide a rough estimate of the viral load and cannot be relied solely on their numerical values in determining the infectivity and the management protocols [1].

Declaration of competing interest

All the authors confirm that there is no conflict of interest related to our submission entitled 'COVID vaccination provided protection from severe disease despite of low Cycle threshold (Ct) values'.

There was no financial grant or funding received.

References

- [1] Evidence based advisory on correlation of COVID-19 disease severity with Ct values of the real time RT-PCR test. Indian council for medical research (ICMR). 5th August 2020. https://www.icmr.gov.in/pdf/covid/techdoc/Advisory_on_correlation_of_COVID_severity_with_Ct_values.pdf.
- [2] Vaishya R, Sibal A, Malani A, Hari Prasad K. SARS-CoV-2 infection after COVID-19 immunization in healthcare workers: a retrospective, pilot study. Indian J Med Res 2021. https://doi.org/10.4103/ijmr.ijmr_1485_21.
- [3] Vaishya R, Sibal A, Malani A, Singh SK, Das S. Emergence of COVID-19 variants among ChAdOx1 nCoV-19 (Recombinant) Vaccine recipients. Indian J Med Res 2021. https://doi.org/10.4103/ijmr.ijmr_2061_21.
- [4] Dhar MS, Marwal R, Radhakrishnan VS, et al. Genomic characterization and Epidemiology of an emerging SARS-CoV-2 variant in Delhi, India. 3rd June 2021. medRxiv 2021. <https://doi.org/10.1101/2021.06.02.21258076>.
- [5] Vaishya R, Sibal A, Singh SK, Malani A, Hariprasad K, Mediratta L, Butta H. ChAdOx1 n-COV 19 Vaccine protected against severe infection caused by the Variants. Mayo Clin Proc August 2021. <https://doi.org/10.1016/j.mayocp.2021.07.016>.
- [6] Vaishya R, Sibal A, Sharma H, Singh SK. Lack of vaccination and associated comorbidities predispose to the need for intensive care in individuals infected with the Delta variant – a case cohort study from a Tertiary Care Hospital in New Delhi, India. Diabetes & Metabolic Syndrome. Clin Res Rev 2021;15: 102203. <https://doi.org/10.1016/j.dsx.2021.102203>.

Raju Vaishya*, Arpita Malani, Himani Sharma, Abhishek Vaish
Indraprastha Apollo Hospitals, Sarita Vihar, New Delhi 110076, India

Sujeet Kumar Singh
National Centre for Disease Contgrol, Shamnath Marg, Delhi 110054,
India

E-mail address: sujeet647@gmail.com.

* Corresponding author.

E-mail addresses: raju_vaishya@apollohospitalsdelhi.com (R. Vaishya), dr_arpita@apollohospitalsdelhi.com (A. Malani),

himani_s@apollohospitalsdelhi.com (H. Sharma),
drabhishekvaish@gmail.com (A. Vaish).

6 September 2021