

**Fight against the delta variant! Where does Pakistan stand?**Dayab Asad,<sup>1</sup> Syed Hasan Shuja,<sup>2</sup> Ganesh Kumar<sup>3</sup>

Madam, since its first appearance in India in December 2020, the B.1.617.2 (delta) variant has spread across 85 countries as of yet. Its rapid proliferation has enforced WHO to classify the strain as a "variant of concern". Equipped with 10 spike protein mutations (T19R, (G142D\*), 156del, 157del, R158G, L452R, T478K, D614G, P681R, D950N), especially the P681R mutation at the cleavage site S1-S2,<sup>1</sup> the virus now has the ability to replicate and transmit at a rate much faster than the original SARS-CoV-2. This is evident from the fact that it is detectable in infected individuals just under 4 days after it's contraction, with a viral load 1,260 times higher, as compared to 6 days with the earliest form.<sup>2</sup>

Researchers are uncertain regarding the efficacy of existing vaccines against the delta strain. A recent preliminary study analysed the efficacy of BNT162b2 (Pfizer) and ChAdOx1 nCoV-19 (AstraZeneca) against the mutated version. The study revealed markedly lower effectiveness after one dose, and moderate effectiveness after two doses among people infected with delta variant for both the vaccines.<sup>3</sup> The recent finding is daunting for Pakistan as the nation has seen a rapid surge in delta variant cases. In Karachi alone, the positivity ratio has inflated up to an alarming level of 23.6% with the major hospitals operating at full capacity.<sup>4</sup> Although the process of vaccination is ongoing, still 20202951 (20 million) individuals remain partially vaccinated,<sup>5</sup> while the rest of the population remains unvaccinated which poses a serious concern for Pakistan since such individuals, as stated earlier, are at a greater risk of contracting the delta variant.<sup>3</sup> Considering that the virus will continue to mutate, it is imperative that preventive guidelines including the use of a mask, social distancing must be practiced and travel restrictions must be imposed in order to curtail the spread. Additionally, booster shots can be administered to increase the efficacy of these vaccines.

Moreover, a study conducted on mice evaluated the

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response of recombinant chimpanzee adenovirus (AdC7) vaccine expressing S<sub>1</sub> receptor-binding domain (RBD) or tandem-repeat dimeric RBD (RBD-tr2) (AdC7-RBD-tr2) administered via intramuscular (systemic) and intranasal (mucosal) route. This vaccine exhibited a greater neutralising effect on the delta variant than the existing vaccines. The intranasal administration produced mucosal immunity with neutralizing activity in Broncho alveolar lavage fluid thus offering greater protection to the respiratory tract, a quintessential goal to terminate SARS-CoV-2 transmission.<sup>6</sup> Although the trial was conducted on mice, it should be kept in mind that 4 adenovirus-vectored vaccines are already in use. Hence, this vaccine can prove to be an interesting prospect for further preclinical and clinical trials for prevention of covid-19 and its evolving variants.

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