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CORRESPONDENCE

Omicron BA.1, BA.2 and COVID-19 Booster Vaccination

To the Editor—In reply to the correspondence from Tjan et al [1] regarding the heterologous booster in healthy adults previously immunized with 2 doses of CoronaVac [2], the additional knowledge on immunogenicity of the booster (third dose) with BNT162b2 in BNT162b2-primed individuals against the BA.2 omicron variant will help promote the vaccine uptake and coverage in the midst of a surge in BA.2 omicron worldwide.

As of February 2022, the omicron variant was further classified into 4 main sublineages, BA.1, BA.1.1, BA.2, and BA.3. Moreover, an epidemiological surveillance on coronavirus disease 2019 (COVID-19) showed that BA.2 sublineages have become the dominant variant globally [3]. In Thailand, the BA.2 sublineages have been detected since the end of January 2022. The proportion of BA.2 sublineages rapidly increased and accounted for more than 90% of positive cases reported in March 2022 [Puenpa J et al. unpublished]. Potent serum neutralizing antibody (nAbs) against BA.1 was observed after the heterologous booster in individuals previously immunized with 2 doses of CoronaVac [2]. Considering the waning immunity after primary series vaccination and the high transmissibility and potential immune escape of BA.2 sublineage, we further determined the immunogenicity of the mRNA-1273 booster against BA.1 and BA.2 in AZD1222-primed individuals using the 50% focus reduction neutralization test ($FRNT_{50}$) as previously described [2].

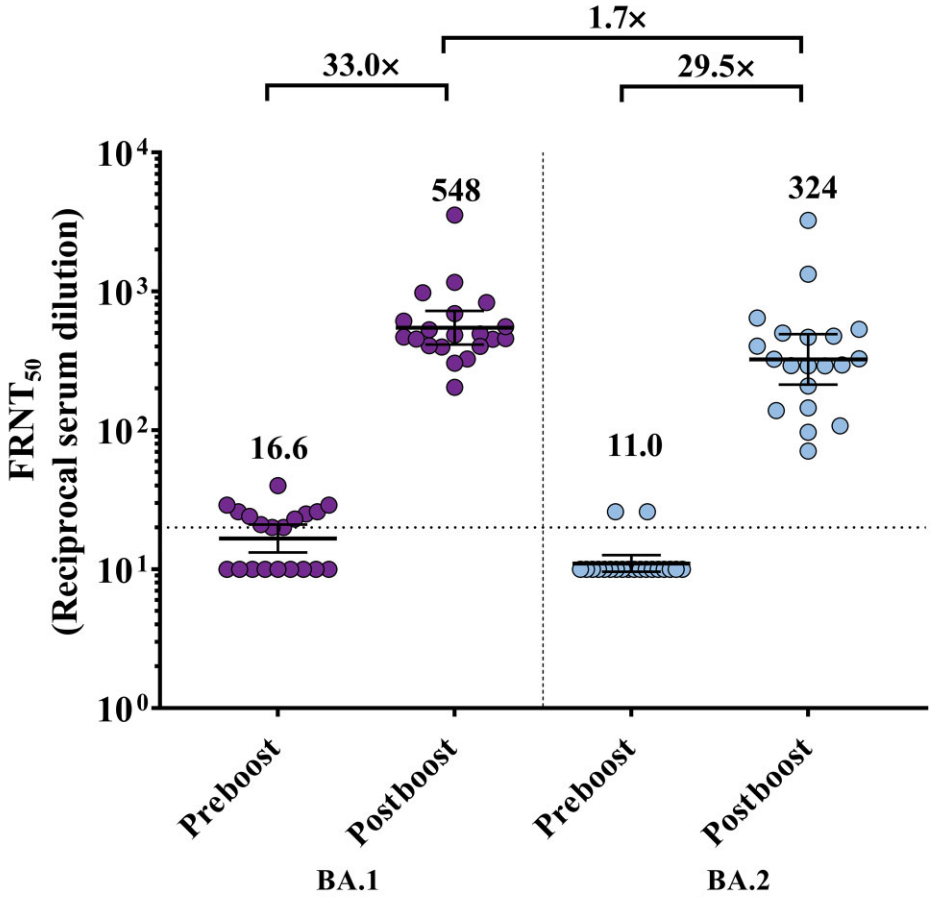

Figure 1. Neutralizing antibody titers of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) against BA.1 and BA.2 omicron variants at prebooster and 28 days postbooster. Neutralization of SARS-CoV-2 was measured using the 50% focus reduction neutralization test ($FRNT_{50}$). Each data point represents an individual who received mRNA-1273 as a booster dose. Error bars indicate geometric mean titer and 95% confidence interval. Values below the limit of detection (titer < 20) were substituted with a titer of 10.

Participants were 20 healthy Thai adults aged 18 years and older (mean age 50.66 years, SD 12.95 years) who received 2 doses of AZD1222 vaccination and had no previous or current COVID-19 infection. The participants received mRNA-1273 as a booster (third dose) vaccine at 5–7 months after the second dose of AZD1222. Blood samples were collected at 28 days after the booster. In accordance with the results previously reported by Tjan et al and Yu et al [1, 4] Undetectable (titer $<$ 20) nAbs against both BA.1 and BA.2 were observed among most participants before the booster. At 28 days after the booster the geometric mean titer of nAbs significantly increased from 16.6 (95% confidence interval CI], 13.2–21.0) and 11.0 (95% CI, 9.6–12.6) to 548 (95% CI, 415–723) and 324 (95% CI, 214–492) against BA.1 and BA.2, respectively. The results demonstrated that after the mRNA booster, the nAbs titers against BA.2 were slightly lower than those against BA.1 (Figure 1).

These preliminary results indicate that the heterologous booster with mRNA vaccine in AZD1222-primed individuals could induce a robust antibody response that can cross-neutralize both BA.1 and BA.2 omicron variants.

Notes

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