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

Acknowledgments. We thank the staff of the Center of Excellence in Clinical Virology and all the participants for helping and supporting this project; and the Ministry of Public Health, Chulabhorn Royal Academy, and Zullig Pharma for providing the vaccines for this study.

Financial support. This work was supported by the Health Systems Research Institute, National Research Council of Thailand; Chulalongkorn University (Center of Excellence in Clinical Virology and Second Century Fund); King Chulalongkorn Memorial Hospital; and the National Center for Genetic Engineering and Biotechnology (grant number P2051613 to T. D.).

Potential conflicts of interest. The authors: No reported conflicts of interest. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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Received 21 April 2022; editorial decision 21 April 2022; accepted 22 April 2022; published online 27 April 2022

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The Journal of Infectious Diseases® 2022;226:1480–1
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https://doi.org/10.1093/infdis/jiac158

Induction of High Neutralizing Activity Against Both Omicron BA.2 and Omicron BA.1 by Coronavirus Disease 2019 Messenger RNA Booster Vaccination

To the Editor—Assawakosri et al [1] reported that heterologous booster vaccines significantly increased binding and neutralizing antibodies (nAbs) against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants of concern (VOCs), including the Omicron variant (BA.1) in individuals immunized with 2 doses of CoronaVac, indicating possible vaccine strategies to thwart VOCs. The most recently designated VOC of SARS-CoV-2, Omicron, is associated with an increased risk of reinfection [2]. Among 4 sublineages of Omicron (BA.1, BA.1.1, BA.2, and BA.3), BA.1 has spread to >151 countries and is responsible for the greatly increased number of coronavirus disease 2019 (COVID-19) cases worldwide. However, Omicron BA.2 has also been detected in ≥85 countries and became the dominant lineage in 18 countries by mid-February 2022 [3]. BA.2 has become the next dominant variant worldwide.

A recent epidemiological study in South Africa suggested that the clinical profile of illness caused by BA.1 infection is similar to that caused by BA.2 [4]. Although BA.2 infection has generally been associated with mild illness, its high transmissibility may be

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accompanied by high numbers of cases with considerable societal impacts (eg, greater work absences).

In response to the surge in Omicron BA.1 cases, booster vaccination was initiated in many countries. In addition to the study reported by Assawakosri et al [1], our study and others showed that BA.1 escapes 2 doses of BNT162b2 messenger RNA vaccine-induced neutralization and that a booster (third) vaccination is required to induce the nAb against BA.1 [5, 6].

There is, however, limited evidence regarding the effectiveness of a booster vaccination against BA.2 [7, 8]. Therefore, we collected blood samples from 84 physicians at Kobe University Hospital in Kobe, Japan, in January 2022 (median age, 44 years; interquartile range, 33–58 years) about 7 months after they had received 2 BNT162b2 vaccinations and about 2 weeks after their first booster vaccination. We performed a serum neutralizing assay against BA.2 using authentic virus, as described elsewhere [5]. No participants had a history of SARS-CoV-2 infection. The study was approved by the ethical committee of the Kobe University Graduate School of Medicine (approval code B200200). All participants were recruited and provided written informed consent.

The results demonstrated that, similar to results with BA.1 [5], most participants had no or a very low nAb titer against BA.2 at 7 months after 2 BNT162b2 vaccinations (geometric mean titer, 1.18 [95% confidence interval 1.09–1.27]). However, the titer increased significantly 2 weeks after the booster vaccination (geometric mean titer, 36.44 [95% confidence interval, 30.53–43.50]; $P < .001$) (Figure 1).

These results indicate that a booster vaccination could induce neutralizing immunity against Omicron BA.2 (as it has against BA.1) and that a booster dose of BNT162b2 messenger RNA vaccine induces a high cross-neutralizing response against SARS-CoV-2 variants [5]. This may indicate that booster vaccination is a meaningful approach for the suppression of BA.2 pandemic and can activate memory B cells that produce nAbs recognizing epitopes conserved among SARS-CoV-2 variants.

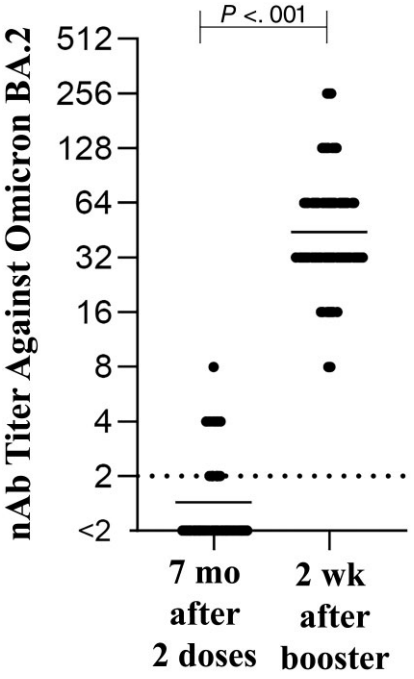

Figure 1. Neutralizing antibody (nAb) titers against Omicron BA.2 in BNT162b2 messenger RNA–vaccinated men (n = 84) at 7 months after they had received 2 vaccine doses and at 2 weeks after a booster vaccination. Dotted horizontal line represents the limit of detection; solid horizontal lines, the geometric mean titers. Titers were compared by means of the 2-sample Wilcoxon rank sum (Mann-Whitney) test; 2-tailed *P* values were calculated.

Notes

Acknowledgments. We gratefully acknowledge Kazuro Sugimura MD, PhD (superintendent of the Hyogo Prefectural Hospital Agency and professor at Kobe University), for giving his full support to this study. We also thank the National Institute of Infectious Disease Japan for providing the severe acute respiratory syndrome coronavirus 2 Omicron BA.2 variant.

Disclaimer. The funders had no role in study design, data collection and analysis, the decision to publish, or the preparation of the manuscript.

Financial support. This work was supported by the Hyogo Prefectural Government (Y. M.).

Potential conflicts of interest. All authors: No reported conflicts. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed

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Received 07 April 2022; editorial decision 21 April 2022; accepted 24 April 2022; published online 28 April 2022

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https://doi.org/10.1093/infdis/jiac159

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