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Mixing or mating: Success key for protection against Covid-19 infection following Boosters administration in Malaysia

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Booster doses were required to maintain protection due to the development of SARS- CoV-2 mutations and the decline in immunity following first immunization. Global attention has been drawn to heterologous boosters because of their capacity to elicit stronger immune responses. Therefore, this study's objective was to evaluate the immunological kinetics of both homologous and heterologous booster vaccines in Malaysia's multiethnic population.The recipients of homologous (Comirnaty-Comirnaty, CoronaVac-CoronaVac, Vaxzevria-Vaxzevria) and heterologous (CoronaVac-Comirnaty, Vaxzevria-Comirnaty) boosters participated in a prospective observational cohort study from September 2021 to August 2022. A total of 189 recipients finished the follow-up. From week 0 to week 24 after receiving the third dose of the booster immunization, peripheral blood was extracted every four weeks. Quantification of anti-S IgG and assessment of neutralizing Ig-RBD titre against delta variants were performed on individual plasma samples.Comirnaty boosters after CoronaVac or Vaxzevria primary vaccine significantly enhanced binding (anti-S IgG) and neutralizing antibody titres (Ig- RBD) compared to homologous boosters, and specifically heterologous boosters ($p<0.001$). When compared to the comparable vaccine groups, the inhibition of the anti-S IgG antibody response was considerably lower ($p<0.01$) in the CoronaVac-Comirnaty group. The maturation of plasma B-cells to IgM and IgG memory B-cells was markedly enhanced by heterologous immunization ($p<0.002$). According to these findings, there were no appreciable variations in vaccination response by gender, age, or ethnicity. In the diverse Malaysian population, heterologous COVID-19 booster therapies produce superior humoral and cellular immune responses and thereby increasing protection against infection.

Keywords: COVID-19 vaccine, Heterologous booster, Homologous booster, Immunogenicity, Multi-ethnic population in Malaysia.

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