

# Neutralizing Antibody Dynamics and Correlation with Anti-RBD IgG Levels after CoronaVac Vaccine and Booster Immunization in Healthcare Workers

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## Abstract

**Introduction:** Vaccine-induced neutralizing-antibodies(NAbs) are key for COVID-19 protective-immunity. This study aimed to assess Nabs-dynamics during nine-month follow-up-period after primary-CoronaVac vaccination and booster-immunization and its correlation with anti-RBD-IgG-levels to evaluate vaccination-strategies. **Material and Method:** This prospective-cohort-study followed 226-healthcare-workers who received double-dose CoronaVac at a university-hospital. Serum samples were collected at four-different-time points after primary and booster(CoronaVac-BNT162b2) immunization. Antibody-levels were assessed by SARS-CoV-2-IgG-II-QUANT(Abbott, USA) and ACE2-RBD-Neutralization-Assay(Dia-Pro, Italy)tests. Factors affecting antibody-response were analyzed. Statistical analysis was performed with IBM-SPSS-22.0. **Results:** NAb were detected in 79.2% of participants one-month after the second-dose of CoronaVac but decreased to 48.8% by the fourth-month and was influenced by smoking,BMI and the presence of chronic-diseases. Boosters,regardless of type, significantly raised Nab-levels. Heterologous-vaccination yielded higher NAb and anti-RBD-IgG responses. Single or double-BNT162b2 boosters resulted in similar NAb responses. A strong-correlation was found between anti-RBD-IgG response and Nabs-levels following CoronaVac-vaccination, leading to the determination of predictive IgG-thresholds for the presence-of Nab. The type of-booster influenced the correlation strength and threshold-value. **Conclusion:** Nabs-levels drop rapidly after primary double-dose CoronaVac-vaccination. Booster-doses significantly increase these levels while the combination of heterologous-vaccines ensures a higher-response. Anti-RBD-IgG levels can predict NAb response however the correlation varies by the type of-vaccine, the strength of the resulting Nab response and the time-since-vaccination.

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