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Severe acute respiratory syndrome coronavirus 2 antibody response after heterologous immunizations with ChAdOx1/BNT162b2 in end-stage renal disease patients on hemodialysis

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Objectives: The Korean government decided to schedule heterologous vaccination for dialysis patients for early achievement of immunization against Coronavirus disease 2019 (COVID-19). However, the effects of heterologous immunizations with ChAdOx1/BNT162b in hemodialysis patients are unclear.

Methods: One hundred hemodialysis(HD) patients from two hospitals (Gangdong Kyung Hee University Hospital and Kyung Hee Medical Center) and 100 hospital workers from Gangdong Kyung Hee University Hospital were enrolled in this study. HD patients received the mixing schedule of ChAdOx1/BNT162b2 vaccinations with a 10-week interval, while hospital workers received two doses of ChAdOx1 vaccines at 12-week intervals. Serum IgG to receptor-binding domain (RBD) of the S1 subunit of the spike protein of SARS-CoV-2 was measured 1 month after the first dose, and 2 months and 4 months after the second dose.

Results: The median [interquartile range] anti-RBD IgG level was 82.1[34.5, 176.6] AU/ml in HD patients and 197.1[124.0, 346.0] AU/ml in the hospital workers ($P < 0.001$) after the first dose of vaccine. The percentage of positive responses (IgG > 50 AU/ml) was 65.0% and 96.0% among the HD patients and hospital workers, respectively ($P < 0.001$). The anti-RBD IgG levels increased significantly 2528.8[1327.6, 5795.1] AU/ml with a 100.0% positive response rate in HD patients 2 months after the second dose of vaccine. Moreover, anti-RBC IgG remains constantly high, and positive response remains 100% in HD patients 4 months after the second dose of vaccine.

Conclusions: This study suggests that heterologous vaccination with ChAdOx1/BNT162b2 can be an alternative solution for HD patients for early and strong induction of humoral response and maintaining them.