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LETTER TO THE EDITOR

Long-term antibody response following COVID-19 vaccination in patients receiving peritoneal dialysis

Dear Editor,

Patients receiving peritoneal dialysis (PD) develop detectable early humoral responses following two doses of the mRNA-based Pfizer BNT162b2 vaccine or AZD1222 Oxford-AstraZeneca COVID-19 vaccinations.[1,2] Murt et al showed that 95.6% of PD patients developed SARS-CoV-2 IgG seropositivity 3–4 weeks following two doses of inactivated SARS-CoV-2 vaccine (CoronaVac, developed by Sinovac Life Sciences).[3] Sustained antibody responses 6 months following two doses of BNT162b2 were recently reported in a cohort of 64 PD patients.[4] A UK study involving hemodialysis patients showed differential early immune response to BNT162b2 and AZD1222 vaccines with the latter inducing suboptimal neutralizing antibody levels.[5] The duration of detectable humoral response following AZ1222 and BNT162b2 vaccines with UK extended dosing interval (6–14 weeks) in PD patients is unknown. We present data on long-term antibody response following two doses of AZ1222 or BNT162b2 vaccines with UK dosing intervals for 72 PD patients in our center.

COVID-19 antibody testing was performed using Siemens' immunoassay targeting the spike protein S1 RBD (index ≥1.0 was deemed positive) during October to November 2021. The median age of the cohort was 61 years with a predominance of males (61%) and Caucasian ethnicity (73.6%). Eighty-six percent had a history of hypertension with 30.5% being diabetic. Thirty-nine percent had a background history of cardiovascular disease, and 4.1% had a history of cancer. Nineteen patients (26.4%) had a history of being on immunosuppression previously or currently (nine for previous transplantation and 10 for primary renal disease, e.g., vasculitis). Ten patients were on concurrent immunosuppression on vaccination, and nine had received immunosuppression previously. The median time between the cessation of immunosuppression and vaccination was 21 months. A majority (75%) received the BNT162b2 Pfizer vaccine and 22% received the AZD1222 AstraZeneca vaccine. The median time between second dose of COVID-19 vaccination and antibody testing was 6.3 months (5.8–6.7). Sixty-eight (94.4%) patients had a positive antibody, and four (5.6%) patients had a negative antibody test. Having a history of immunosuppression was associated with a negative antibody status ($p = 0.004$) (Table 1).

TABLE 1 Distribution of the cohort characteristics based on COVID-19 antibody status post vaccination

Variables	Total ($n = 72$)	Positive ($n = 68$)	Negative ($n = 4$)	p-value
Age	61 (47–70)	61 (47–69)	62 (51–69)	0.863
Gender (Male)	44 (61.1%)	41 (60.3%)	3 (75%)	1.000
Ethnicity (Caucasian)	53 (73.6%)	49 (72.1%)	4 (100%)	0.567
Diabetes mellitus	22 (30.5%)	22 (32.4%)	0	0.306
Hypertension	62 (86.1%)	59 (86.8%)	3 (75%)	0.458
Cardiovascular disease	28 (38.8%)	25 (36.8%)	3 (75%)	0.292
Cancer	3 (4.1%)	3 (4.4%)	0	1.000
Immunosuppression	19 (26.4%)	15 (22.1%)	4 (100%)	**0.004**
Vaccination type				
BNT162b2 Pfizer	54 (75%)	50 (75.8%)	4 (100%)	0.567
AZD1222 AstraZeneca	16 (22.2%)	16 (24.2%)	0	
Unknown[a]	2 (2.8%)	2 (2.94%)	0	
Time between vaccination and antibody test (months)				
First dose vaccination		9 (8.6–9.5)		
Second dose vaccination		6.3 (5.8–6.7)		

Notes: Categorical variables are expressed as number (%) and p-value (Fisher's exact test). Continuous variables are expressed as median (interquartile range) and p-value (Mann–Whitney U test).

[a]Unknown represents either Pfizer or AstraZeneca, but confirmation was not possible due to lack of access to community records, and the dates were provided by the patients.

Our study concludes that detectable humoral responses to COVID-19 vaccination in PD patients are measurable at 6 months following vaccination irrespective of the type of vaccination received. Limitations of our study include the lack of a quantitative antibody assessment and measurement of neutralizing antibodies. While a third dose of mRNA-based COVID-19 vaccine is being deployed, focused attention toward immunosuppressed PD patients is required.

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