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Humoral response after a fourth “booster” dose of a Coronavirus disease 2019 vaccine following a 3-dose regimen of mRNA-based vaccination in dialysis patients



To the editor: Despite an initial satisfactory increase in severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) antispikes antibody (Ab) titer after completing a 3-dose regimen in the first set of vaccination in dialysis patients,¹ Ab titer substantially decreases at 6 months in this population.² Other authors suggested that for the B.1.1.529 Omicron variant, 3 vaccine doses might be insufficient in in-center hemodialysis patients.³

We assessed the dynamics of the anti-SARS-CoV-2 spike protein S1 total Ig Ab (Roche Elecsys immunoassay⁴) of both hemodialysis (n = 17) and peritoneal dialysis (n = 28) patients who received a 3-dose regimen of the mRNA BNT162b2 (Pfizer–BioNTech), followed by a fourth “booster” dose of mRNA vaccine (BNT162b2, n = 43, or mRNA-1273 [Moderna], n = 2), after a median of 7.6 [interquartile range: 7.1; 7.8] months after the third dose (Supplementary Figure S1). Patients with a breakthrough infection (symptomatic or not) before the fourth dose were excluded (Supplementary Figure S2).

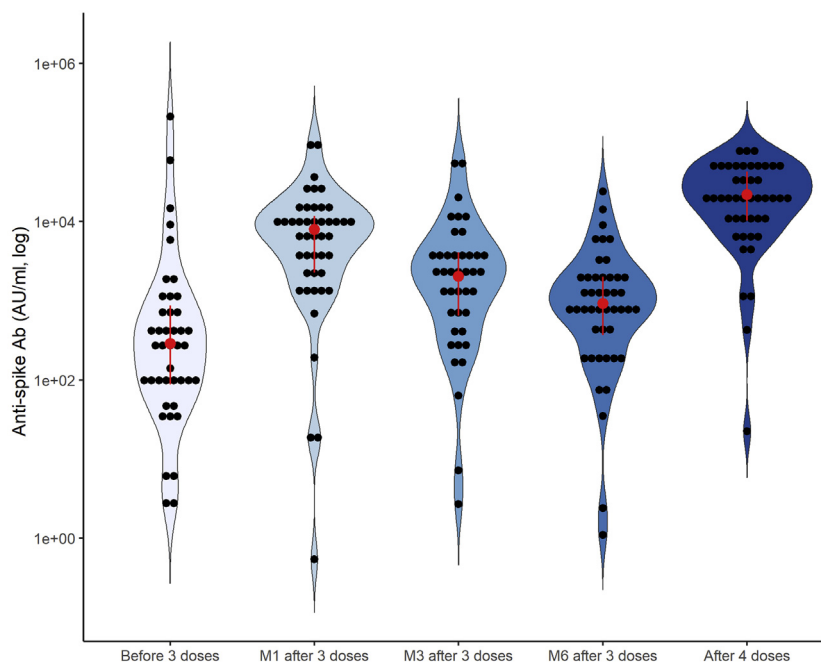


Figure 1 | Kinetics of antispikes antibodies. The figure shows the antispikes antibody (Ab) levels before, and 1 (M1), 3 (M3), and 6 (M6) months after the third dose of the mRNA BNT162b2 vaccine, and after the fourth vaccine dose (BNT162b2 Pfizer–BioNech or mRNA-1273 Moderna) in dialysis patients. Each point represents individual data. Antibody titers lower than 1 cannot be plotted in the graph because of the logarithm scale. The red points and vertical lines indicate the median with interquartile range. Conversion factor: 1 AU/ml = 1.0288 BAU/ml.

In patients (57.8% men, median age 72 [56; 79] years), 15.6% had a history of immunosuppression (Supplementary Table S1). At 15 [14; 22] days after the fourth “booster” dose, antispikes Ab titer significantly increased from 923 [369; 2019] to 21,883 [10,234; 42,870] AU/ml (Figure 1; Supplementary Figure S3), which corresponds to a 19-fold increase (median) in antispikes Ab titer. Ab titer after the fourth dose was 3.4-fold higher (median) than the Ab peak reached after the third dose. Dose 4 appeared well-tolerated (Supplementary Figure S4), and no serious adverse event was observed. After the fourth dose, only 2 patients developed a breakthrough infection (vs. 7 cases of coronavirus disease 2019 after the third dose; Supplementary Table S2).

To conclude, our finding shows that a 3-dose regimen of an mRNA-based vaccine with a fourth booster dose appears to produce an important antibody response in dialysis patients, with a significant increase in antispikes Ab titer. Long-term follow-up studies are needed to assess if this vaccination strategy elicits a durable and robust protective immune response against SARS-CoV-2 in dialysis patients.

DATA STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

DISCLOSURE

All the authors declared no competing interests.

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AUTHOR CONTRIBUTIONS

PH and A-LF researched the idea, created the study design, acquired the data, and analyzed and interpreted the data. A-LF provided statistical analyses. SK performed the antispikes serology testing. Each author contributed important intellectual content during manuscript drafting or revision.

SUPPLEMENTARY MATERIAL

Supplementary File (PDF)

Supplementary questionnaire on vaccine reactions and global tolerance after the fourth vaccine dose.

Table S1. Characteristics of the study population.

Table S2. Characteristics of the patients with breakthrough coronavirus disease 2019 (COVID-19) after the third or the fourth vaccine dose during the fifth wave pandemic.

Figure S1. Vaccination strategy in dialysis patients.

Figure S2. Flowchart.

Figure S3. Kinetics of the antispikes antibodies.

Figure S4. Self-reported tolerance.

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Early treatment with sotrovimab monoclonal antibody in kidney transplant recipients with Omicron infection



To the editor: Early data about coronavirus disease 2019 (COVID-19) related to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) Omicron variant (B.1.1.529) suggest that it may be less severe than prior variants of concern in the general population.^{1–3} However, our preliminary data (NC, personal communication, January 28, 2022) about Omicron infection in kidney transplant recipients (KTRs) suggest that the disease is associated with severe forms in this vulnerable population with low postvaccinal immune responses.

Sotrovimab monoclonal antibody has been demonstrated to reduce disease progression in high-risk patients with mild-to-moderate COVID-19 before the Omicron era.⁴ Recent studies assessed that, in contrast with other monoclonal antibodies, it remained active against the Omicron spike.⁵

We aimed to compare the clinical outcomes of the first 25 KTRs treated with sotrovimab for mild-to-moderate Omicron COVID-19 with KTRs who did not receive sotrovimab.

Sotrovimab was available in our institution (Necker Hospital, Paris, France) from January 25, 2022. KTRs with a high risk for progression of COVID-19 (because of older age [≥55 years] or because they had at least 1 of the following risk factors: diabetes, obesity [body mass index >30, estimated glomerular filtration rate <30 ml/min], coronary artery