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# Impact of Kidney Transplantation on Humoral Immunity against SARS-CoV-2: a Case-Series from Belgium.

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**Authorship:**

GF, AD, AS, NK: research idea, study design, data analysis; GF, data acquisition; AS and BK performed serologic analysis; AS performed statistical analysis; GF, AD, AS, BK, MDM, MM, TD, AB, JDG, LB, JCY, EG and NK took care of the patients. All authors discussed and reviewed the manuscript.

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Anti-SARS-CoV-2 vaccines have shown good efficacy in kidney transplant candidates[1], contrasting with disappointing results in kidney transplant recipients (KTRs).[2] However, the impact of starting immunosuppressive treatments for KT on anti-SARS-CoV-2 humoral immunity has been poorly investigated so far.

We report the evolution of anti-SARS-CoV-2 antibody (Ab) titers in 14 KTRs, transplanted in our center between 01/2021 and 06/2021, who received at least one vaccine dose prior to KT. We assessed the anti- receptor-binding domain (RBD) Ab titers (Elecsys anti-SARS-CoV-2, Roche Diagnostics GmbH, Mannheim, Germany - positive threshold ≥0.8 U/mL) on the day of transplantation (day 0) and 28 days after (day 28). This work received IRB approval.

Ten patients had received their second dose of either the BNT162b2 (Pfizer-BioNTech, n=8) or ChAdOx1 nCoV-19 vaccine (AstraZeneca, n=2) a mean time of 57 (ranges: 25-78) days before KT. Four patients had received a single dose of vaccine (Pfizer n=2, AstraZeneca n=2) a mean time of 29 (ranges: 15-30) days before KT. The mean age was 58 (ranges 32-77) years and 57% were male. Twelve patients were on dialysis before transplantation with a mean duration of 54 (ranges 20-122) months. One patient had a prior history of COVID-19.

After KT, all patients were treated with an association of tacrolimus (trough levels: 10-13 ng/mL), mycophenolate (500 mg bid) and steroids. Sensitized patients (n=3) and KTRs who received a graft from a living donor (n=2) were additionally inducted with Thymoglobulin and basiliximab, respectively. None of the patients developed COVID-19 after KT.

On day 0, the mean anti-RBD Ab titer was high (mean ± SEM: 1124 ± 441 U/mL). However, KTRs who had received a single dose of vaccine (n=4) showed low mean Ab titer (0.83 ±0.43 U/mL). On day 28, we observed a significant decrease of anti-RBD Ab titers (Figure 1). However, Ab titers remained high (514 ± 205 U/mL) compared to those reached in vaccinated KTRs that we previously published.[2] Not surprisingly, the four patients who had received a single dose of vaccine had low Ab titer on day 28 (2.85± 1.84 U/mL). Interestingly, on day

28, anti-RBD Ab titers in patients inducted with Thymoglobulin (n=3) or basiliximab (n=2) were high (107, 332, 787 and 577, 1132 U/mL; respectively).

Our results are in line with those recently published.[3,4] Yi et al showed a persistent immunogenicity 25 days after KT of the mRNA vaccine in 8 KTRs (including 5 who received a T-cell depleting induction).[3] Mohamadou et al also demonstrated that despite a 55% drop, anti-SARS-CoV-2 Ab titers remained high 15 days after KT in 7 patients (6 inducted with anti-thymocyte globulins and 1 with basiliximab) who had received 2 mRNA vaccine doses before transplantation.[4]

These results suggest that fully vaccinated patients maintain high Ab titers against SARS-CoV-2 in the first month post-KT, even in KTRs receiving induction therapy. It highlights the benefit to vaccinate all candidates before KT.[5] Other studies are required to assess the long-term evolution and the impact of other therapies used in KT (ie. Rituximab,…) on anti-SARS-CoV-2 Ab acquired before KT.

## References


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**Figure legend**

Figure 1: Evolution of anti-RBD antibody titers.

Mean (± SEM) antibody titer on day 0 and day 28: 1124 (± 441) U/mL and 514 (± 205) U/mL (p=0.003, Wilcoxon test)

Figure 1