

# Neutralizing antibodies titers against 10 viral Spike protein variants of SARS-CoV-2 in serum of patients receiving dialysis before and 30 days after the vaccination with XBB1.5 updated mRNA vaccine

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## Introduction/Summary

- In the last 4 years from the start of the COVID-19 pandemics SARS-CoV-2 has continuously mutated to create viral variants which could escape partially or completely the immune protection induced by previous infections and original mRNA vaccine. New updated vaccines have been released and one of them included the sequence of the Spike protein corresponding to the XBB1.5 variant.

## Study Design/Methods

- We have performed the analyses of the IgG neutralization titers against WT and 9 viral variants in patients receiving dialysis and healthy controls vaccinated with XBB 1.5 containing mRNA COVID-19 vaccine.
- 74 patients receiving maintenance dialysis and 10 healthy controls (Health Care Worker, HCW) were enrolled.
- The nephrology patients had been vaccinated with 4 doses of the original mRNA based vaccines and in November 2023-January 2024 they received the 5th dose of the XBB1.5 vaccine.
- Serum samples were collected before the vaccination and 1 to 1,5 months later.
- The surrogate IgG SARS-CoV-2 neutralization test, developed and provided by Lausanne University Hospital researchers, was used to evaluate the response to the vaccination and its potentials to neutralize 10 SARS-CoV-2 viral variants.

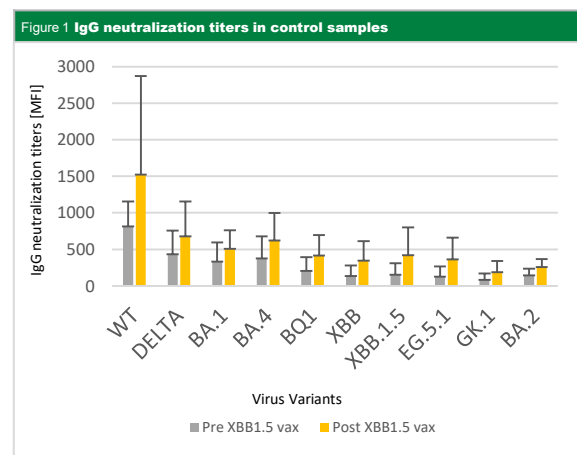
## General Results

- Dialysis patients mount significant response to the vaccination in terms of the production of neutralizing antibodies.
- Those who were vaccinated and received up to 4th doses responded strongly with the production of neutralizing IgG, especially against wild type (WT) and Delta SARS-CoV-2 variants but not for other variants.
- 5th dose of new XBB 1.5 vaccine gave significant boost and augmented the neutralizing IgG titers not only against WT and Delta variant, but significant increased protection against XBB, XBB.1.5 BQ.1, BA.1, BA.2, BA.4, GK.1, and EG5.1 variants.
- The levels of the IgG neutralizing titers of patients were not significantly different from those of healthy controls.

## Results of 1

### IgG neutralization titers in control samples

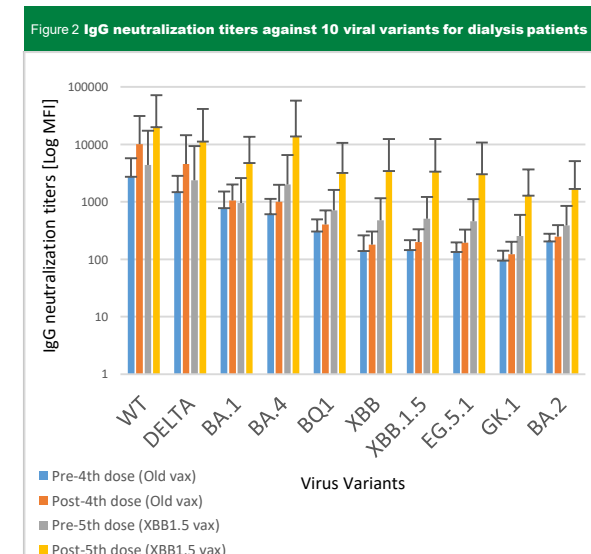
As shown in figure 1, administration of the anti-COVID-19 vaccine updated with spike sequence mRNA specific to XBB 1.5 SARS-CoV-2 variant to healthy control group has not induced significantly higher titers of neutralizing IgG against wild type (WT) and 9 viral variants. (MFI= mean fluorescence intensity).



## Results of 2

### IgG neutralization titers against WT and 9 viral variants in patient receiving dialysis

As shown in figure 2, patients receiving dialysis, who were vaccinated and received up to the fourth dose of anti-COVID-19 mRNA based vaccine, showed high IgG neutralization titers against WT and Delta already before the 5th dose. However, the titers of these antibodies for other variants of SARS-CoV-2 BA.2, BQ1, XBB, XBB 1.5, EG5.1, GK.1 were much lower at this time point. Administration of the fifth dose of the new COVID-19, XBB 1.5 vaccine, increased significantly neutralizing IgG titers for all variants analyzed, excluding WT and Delta. (MFI= mean fluorescence intensity).



## Results of 3

### IgG neutralization titer ratio in patients and control samples

Figure 3 demonstrates the effect of the administration of new, XBB 1.5 updated COVID-19 vaccine on the IgG EC50 neutralization titers obtained post-vaccination in relation to those observed at pre-vaccination time point. This vaccination increased neutralizing IgG titers against all viral antigens tested. However, these increases were not significant in regard of neutralization titers against WT, DELTA, and BA.2 variants. Significantly enhanced titers of these antibodies were observed for all other 7 viral variants. Moreover, IgG neutralization titers for dialysis patient weren't significantly different than HCW. Similarly to healthy controls, this vaccine generated high IgG titers capable of neutralizing the new SARS-CoV-2 variants.

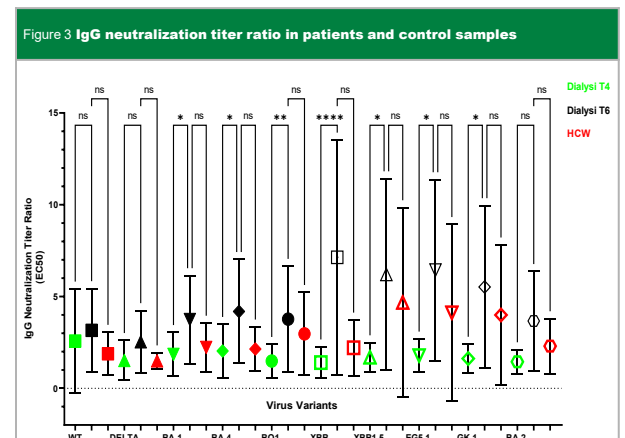


Fig.3: In green, the IgG anti-SARS-CoV-2 Neutralization titers response ratio for on dialysis patients after receiving 4th dose of vaccine (original construct). In black, the IgG anti-SARS-CoV-2 Neutralization titers response ratio for on dialysis after receiving 5th dose of COVID-19 vaccine (new, original/XBB variant containing mRNA). In red, the IgG anti-SARS-CoV-2 Neutralization titers response ratio for Health Care Worker after receiving 5th dose of vaccine (new, original/XBB variant containing mRNA).

## Conclusion

- Dialysis patients respond to SARS-CoV-2 XBB1.5 updated vaccine similarly to healthy controls.
- This vaccine generated high IgG titers that can neutralize new SARS-CoV-2 variants.
- These data support the vaccination of fragile nephrologic subjects with the updated vaccine to protect them from severe diseases and extend protection against new variants.

## Acknowledgement

- Study funded by European Union's Horizon Europe Research and Innovation Actions, Grant/Award Number: 101046041
- CoVICIS: EU-Africa Concerted Action on SARS-CoV-2 Virus Variant and Immunological Surveillance.

## References

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