

#2518

EFFECT OF VACCINATION ON OXIDANT/ANTIOXIDANT STATUS IN HEMODIALYSIS PATIENTS WITH POST-COVID CONDITIONS

Lesya Korol¹, Natalia Stepanova^{1,2}, Tetyana Ostapenko³, Andriy Rysyev⁴, Valeriya Marchenko³ and Olga Belousova³

¹State Institution "Institute of Nephrology of the National Academy of Medical Science of Ukraine", Nephrology & Dialysis, Kyiv, Ukraine, ²Dialysis Medical Center LLC "Nephrocenter", Nephrology, Kyiv, Ukraine, ³Dialysis Medical Center LLC "Nephrocenter", Nephrology, Zaporizhzhia, Ukraine and ⁴Dialysis Medical Center LLC "Link-Medital", Nephrology, Odesa, Ukraine

Background and Aims: Hemodialysis (HD) patients are at high risk for post-COVID conditions and a high mortality rate over a 1-year period after diagnosis of COVID-19, especially in the first 3 months. Evidence shows that vaccinated individuals who experience breakthrough infection are less likely to report post-COVID conditions compared with unvaccinated individuals. Although oxidative stress has been shown to be an important cause of post-COVID conditions, there is a general lack of data on oxidant/antioxidant status in HD patients with post-COVID conditions. The present study aimed to evaluate the oxidant/antioxidant markers in HD patients with post-COVID conditions according to vaccination status.

Method: A total of 106 HD patients, aged 52.4 ± 10.2 years, and dialysis vintage of 68 (29-134) months, were enrolled in this cross-sectional

observational cohort study. Patients were divided into 3 groups according to their vaccination status and the presence of post-COVID conditions. Group 1 consisted of 36 HD patients who had been fully vaccinated against COVID-19 with either Pfizer-BNT-162b2 or Moderna-mRNA-1273 vaccine and had experienced a post-vaccination SARS-CoV-2 infection and had at least 1 post-COVID symptom. Group 2 consisted of 35 fully vaccinated HD patients who had never been infected with COVID-19 (vaccinated control group), and Group 3 included 35 unvaccinated HD patients who had experienced COVID-19 and had post-COVID conditions (unvaccinated control group). Concentrations of malondialdehyde in serum (MDAs) and erythrocytes (MDAe), sulfhydryl groups (SH-groups), serum catalase activity (CTs), serum transferrin and ceruloplasmin levels were determined 3 months after COVID-19 recovery. Data were expressed as a median and interquartile range [Me (Q25-Q75)] and compared with the Kruskal-Wallis test.

Results: The vaccinated HD patients with post-COVID conditions had the highest concentrations of MDAs and ceruloplasmin, and lower serum levels of CTs and transferrin compared with the vaccinated and unvaccinated control groups (Table 1).

Conclusion: Our findings suggest a significant oxidative imbalance in HD patients with post-COVID syndrome most likely due to the synergistic effects of the virus and the vaccine. The use of antioxidant supplements might be a possible strategy to treat post-COVID conditions in HD patients.

Table 1: Oxidative stress markers in HD patients with post-COVID conditions according to vaccination status.

Oxidative stress markers	Group 1 (n = 36)	Group 2 (n = 35)	Group 3 (n = 35)	p-value
MDAs, $\mu\text{mol/L}$	333 (282-397) ^{2,3*}	256 (192-320) ¹	244 (205-295) ¹	<0.0001
MDAe, $\mu\text{mol/L}$	756 (666-955)	756 (628-910)	682 (679-974)	0.17
SH-groups, mmol/L	1.56 (1.46-1.76)	1.48 (1.36-1.55)	1.72 (1.75-2.1)	0.09
CTs, $\mu\text{kat/L}$	56.1 (12.0-161) ^{2,3}	87.5 (49.7-234) ¹	69.6 (54.1-230) ¹	0.04
Transferrin, g/L	1.9 (1.3-2.7) ^{2,3}	2.9 (1.8-5.2) ¹	3.3 (1.6-6.9) ¹	<0.0001
Ceruloplasmin, g/L	0.23 (0.17-0.32) ^{2,3}	0.17 (0.11-0.25) ¹	0.14 (0.11-0.21) ¹	0.0001