



**Figure 1:** Univariate logistic regression analysis of postvaccination SARS-CoV-2 infection risk factors in HD patients.

## #2600

### INCIDENCE RATE, OUTCOMES, AND RISK FACTORS ASSOCIATED WITH COVID-19 INFECTION IN FULLY MRNA-VACCINATED HEMODIALYSIS PATIENTS

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**Background and Aims:** Despite the high efficacy of vaccines against coronavirus disease (COVID-19), some people continue to become infected with SARS-CoV-2 after vaccination. Older age, immunosuppression, and severe comorbidities are associated with the occurrence of COVID-19 and adverse outcomes in the general population of vaccinated patients. However, because of the above factors, hemodialysis (HD) patients may be at higher risk for postvaccination SARS-CoV-2 infection than the general population, and risk factors associated with COVID-19 in fully vaccinated HD patients have never been studied. The present study aimed to determine the incidence rate, outcomes, and risk factors for SARS-CoV-2 infection in fully vaccinated HD patients.

**Method:** In this multicenter case-control cohort study, we followed HD patients for 1 year after SARS-CoV-2 vaccination and compared incidence rates and outcomes of COVID-19 with unvaccinated patients selected by propensity score matching based on potentially confounding variables (age, diabetes, and dialysis vintage). Patients who had been fully vaccinated against COVID-19 with either Pfizer-BNT-162b2 or Moderna-mRNA-1273 vaccine and had at least one positive SARS-CoV-2 PCR test > 14 days after the second dose were defined as cases. Unvaccinated HD patients who had not been infected with COVID-19 before study enrollment and had at least one positive test thereafter were defined as controls. The outcomes studied were COVID-19-related hospitalizations, oxygen maintenance, and death. Demographic data and routine blood tests (the last measurements before COVID-19) were analyzed as possible risk factors for COVID-19 infection in vaccinated HD patients. Data were presented as incidence rate or proportion and compared with the chi-square ( $\chi^2$ ) test. Univariate logistic regression analysis was used to determine risk factors for SARS-CoV-2 infection after vaccination and presented as odds ratio (OR) and 95% confidence interval (CI).

**Results:** Among a total cohort of HD patients ( $n = 327$ ) aged  $52 \pm 9.4$  years with a dialysis vintage of 44 (21-76.6) months, 133 (40.7%) HD patients were fully vaccinated. During the 12-month follow-up period, the incidence rate of SARS-CoV-2 infection was significantly lower in the vaccinated group compared with the matched unvaccinated group: 0.29 (95% CI 0.18; 0.42) vs 0.59 (95% CI 0.46; 0.74) per patient-year ( $p < 0.0001$ ). Proportions of COVID-19-associated hospitalization ( $\chi^2 = 20.1$ ,  $p < 0.0001$ ), oxygen demand ( $\chi^2 = 27.8$ ,  $p < 0.0001$ ), and death ( $\chi^2 = 7.6$ ,  $p = 0.004$ ) were also significantly lower in the case group compared to unvaccinated matched controls. In risk factor analysis, older age, obesity, dialysis duration of more

than 5 years, arterial hypertension, elevated C-reactive protein, anemia, and low levels of parathyroid hormone and high-density lipoprotein cholesterol were associated with postvaccination SARS-CoV-2 infection (Fig. 1).

**Conclusion:** Vaccinated HD patients had a significantly lower incidence of SARS-CoV-2 infection and associated adverse outcomes compared to the unvaccinated group. HD patients aged  $\geq 65$  years with  $Kt/V < 1.2$ , obesity, dialysis duration of more than five years, arterial hypertension, elevated C-reactive protein, and low levels of hemoglobin, parathyroid hormone, and high-density lipoprotein cholesterol had a higher risk of infection following vaccination.