Sarcopenia is characterized by an involuntary loss of skeletal muscle mass, strength, and function and is usually associated with older age. However, sarcopenia may also be seen at younger ages in patients with chronic kidney disease. The European Working Group on Sarcopenia in Older People (EWGSOP) recently proposed a standardized definition of sarcopenia. We aimed to investigate the incidence of sarcopenia and associated factors in renal transplant recipients.

METHOD: We examined consecutive adult (age > 18 years) renal transplant recipients under regular follow-up in our outpatient clinic during December 2021. We assessed the muscle strength with a handgrip test using a dynamometer and with a chair stand test. Using the Sergi formula, we used bioimpedance analysis to estimate the appendicular skeletal mass. Finally, we measured the gait speed to assess physical performance. Probable sarcopenia was defined as the presence of low muscle strength.

RESULTS: From the 29 October 2021 to 31 December 2021, 33 KTxp developed COVID-19 infection during the previous two pandemic outbreaks: 27 KTxp (first outbreak) and 6 (second). In 50% of cases native vitamin D supplementation was present, halving in 10%. Forty % of pts were also treated with monoclonal antibodies (Ronaprevir®) upon infectious disease specialist evaluation. During the first two outbreaks, hospitalization was necessary in 45% of cases, and 13% of pts died. In the present cohort only 10% of patients required oxygen support and hospitalization. Nobody died.

CONCLUSION: Although very preliminary, our results indicate that the vaccine campaign has noticeably ameliorated the incidence, the clinical presentation and the outcome of COVID-19 in KTxp. This conforming data should further sensitize the medical community on vaccination counseling in KTxp as soon as possible. Study with higher number of patients are needed to further clarify the individual response on antibody production and sensitivity to this still life-threatening infection.

Table 2. Multivariate analysis (logistic regression)

| Variable               | OR (95% CI) | P value |
|------------------------|-------------|---------|
| Age at the time of KT  | 1.0903 (1.0149–1.1714) | 0.0180  |
| Time in dialysis       | 1.0323 (0.9876–1.0789)  | 0.1589  |
| BMI 1Y                 | 0.9414 (0.7338–1.2079)  | 0.6351  |
| Waist circumference 1Y | 1.0124 (0.9402–1.0901)  | 0.7435  |
| LDL 1Y                 | 4.0591 (0.1837–13.9201) | 0.0259  |
| Leptin base line       | 1.0181 (0.9950–1.0417)  | 0.1248  |
| Leptin 1Y              | 1.0320 (0.9785–1.0884)  | 0.0038  |
| Adiponectin 1Y         | 1.0272 (0.8692–1.2139)  | 0.7529  |
| IL6 base line          | 1.0776 (0.9812–1.1834)  | 0.1179  |
| IL10 6M                | 0.8123 (0.5806–1.1365)  | 0.2251  |
| IL10 1Y                | 0.9415 (0.7836–1.1311)  | 0.5195  |

Background and Aims: COVID-19 is a life-threatening infection among elderly, comorbid patients or transplanted patients. In our recently published paper (Campise, M.; Alfieri, C.M.; et al. Pathogens 2021, 10, 964), we described our single-center experience with 82 adult kidney-transplant patients (KTxp) with COVID-19 infection during the previous two pandemic outbreaks: 27 KTxp (first outbreak) and 65 (second). We observed a relatively low and possibly underestimated incidence of infection (5.1%) with a fourfold higher incidence of death almost four times higher than in general population (13%). The availability of COVID-19 vaccines has undoubtedly changed the clinical and laboratory data from the patients' medical records. Following that, sarcopenia was diagnosed with low muscle quantity in patients with physical performance. Probable sarcopenia was defined as the presence of low muscle strength. Appendicular skeletal muscle mass, strength, and function and is usually associated with older age.

METHOD: We recruited a total of 93 kidney transplant recipients (mean age: 59 ± 1.4, male gender 58.1%). About 15.0% of the patients were cadaveric transplants. Probable sarcopenia was performed extensively among our KTxp, with a significance modified the incidence and gravity of COVID-19 infection.

METHOD: Data on KTxp with COVID-19 infection (COV+) from the 29 October 2021 to 31 December 2021 were collected. Particularly, we focused on anthropometric, clinical and therapeutic aspects. In the statistical analyses, continuous variables were expressed as median and interquartile range (25%-75%), and nominal variables were reported as percentage of cases.

RESULTS: From the 29 October 2021 to 31 December 2021, 33 KTxp developed COVID-19 infection, 60% were male. Median age was 50 [29–58] years. Transplant vintage was 57 [27–163] months. Median serum creatinine was 1.30 [1.0–1.9] mg/dl and body mass index was 23 [21–24] kg/m². Immunosuppressive schedule included: CNI inhibitors, steroids and mycophenolate (MMF) in 97–90 and 70% of COV + respectively. In 50% of cases native vitamin D supplementation was present, whereas only 30% of cases were treated with renin-angiotensin inhibitors. Only one had insulin dependent diabetes. At the moment of nephrological swab positivity 64% of COV + had already received three doses of vaccine (Comirnaty (BNT162B2)®) and 30% 2 doses. Only 3% of pts had received a single dose. One patient had refused vaccination for personal reasons.

Antigenasynphosphate swab was performed in 70% of COV + and molecular swab in 60%. Thirty-five % of COV + were tested with both methods.

The most frequent symptoms were: fever (70%), cough (75%) and headache (40%). In the previous outbreaks dyspnea was present in 33% of cases dropping to 13% in this cohort. Smell and taste alteration were present in 25% and 28% respectively. We did not perform the COVID-19 sequence. But, on the base of the symptoms referred, we are confident that 17 patients had delta variant and remaining had omicron.

The first therapeutic approaches were the increase of the daily steroid dosage up to 25 mg (60% of cases) together with MMF temporarily withdrawing in 70% of cases and halving in 10%. Forty % of pts were also treated with monoclonal antibodies (Ronaprevir®) upon infectious disease specialist evaluation. During the first two outbreaks, hospitalization was necessary in 45% of cases, and 13% of pts died. In the present cohort only 10% of patients required oxygen support and hospitalization. Nobody died.

CONCLUSION: Although very preliminary, our results indicate that the vaccine campaign has noticeably ameliorated the incidence, the clinical presentation and the outcome of COVID-19 in KTxp. This conforming data should further sensitize the medical community on vaccination counseling in KTxp as soon as possible. Study with higher number of patients are needed to further clarify the individual response on antibody production and sensitivity to this still life-threatening infection.