

KIDNEY REPLACEMENT THERAPY IN COVID-19 CRITICALLY ILL PATIENTS: A TWO-YEAR EXPERIENCE

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Background

During COVID-19 pandemic the proportion of critically ill patients needing KRT increased considerably. This study aimed to analyze the characteristics of COVID-19 critically ill patients treated with KRT, with particular interest in KRT management and outcomes.

Methods

- Retrospective monocenter study including a cohort of adult patients admitted to an Italian intensive care unit (ICU) in Padua for SARS COV-2 disease with the need for KRT, during the period from March 2020 to February 2022.
- Collecting data at KRT initiation: medical history, clinical and laboratory data, clinical severity indices such as Simplified Acute Physiology Score (SAPS) and Sequential Organ Failure Assessment (SOFA) scores, KRT indication and prescription.
- Complications related to KRT were evaluated and outcomes of this cohort referred to ICU mortality and renal recovery, as defined by acute dialysis quality improvement 2017.

Results

Table 1 shows the main basic characteristics of the patients included in the study.

Patients were severely ill at the time of KRT indication (with a median SOFA score of 16 [IQR 14 - 18], SAPS score of 69 [IQR 60-74]), with moderate/severe acute respiratory failure (median paO_2/FiO_2 ratio of 121 [IQR 89-170]) and cardiovascular impairment (median vasoactive inotropic score of 19 [IQR 6-31]).

Regarding the prescription of CKRT, regional citrate anticoagulation was the first-choice regimen in association with prophylactic or therapeutic systemic heparin anticoagulation (64%), followed by no anticoagulation regimen (12.5%) and systemic heparin anticoagulation regimen (9%). Median dose prescribed was 30,6 ml/kg/h (IQR 28-35). The median KRT time for patient was 312 hours (IQR 119-644 hours).

As Figure 1 illustrates, complications related to KRT were frequent (78%): hypophosphatemia (76%), hypomagnesemia (60%), need for transfusion (13%), thromboembolism (3.6%).

Upon discharge from ICU, 29 patients died (53%), with a median ICU stay of 28 days (IQR 17-37 days) and 26 patients survived (47%) with a median ICU stay of 29 days (IQR 12-41 days). Among ICU survivors, 14 (54%) were still dependent on dialysis treatment, while 12 (46%) recovered renal function, with a median serum creatinine value at discharge of 1.6 mg/dL (IQR 0.8-2.4 mg/dL).

Conclusions

In our experience due to severity of COVID-19 disease, one on seven patients admitted in ICU needed treatment with KRT to support kidney function and/or modulate inflammation. Once KRT started, complications were frequent, and it needed appropriate monitoring. Prognosis was poor: half of the patients died during ICU stay, while among survivors more than 50% were dialysis-dependent upon ICU discharge.

Table 1: Baseline characteristics n=55 (13.8%) CKRT patients in ICU with SARS-COV2 positivity (n=397)

Age, median (IQR)	69 (61-75)
Male sex, n (%)	41 (74.5)
BMI (kg/m ²), median (IQR)	28.5 (26-32)
Comorbidities, n (%)	
Arterial Hypertension	36 (65.5)
Diabetes Mellitus	14 (25.5)
CKD	20 (36.4)
Vasculopathy	13 (23.6)
Indication for renal support, n (%)	
Fluid overload	42 (76.4)
Solute alteration	8 (14.5)
Uremia	32 (58.2)
Acid-base disorder	6 (10.9)

Figure 1. a) most frequent complications during dialysis treatment; b) mortality cohort patients and dialysis-dependence upon ICU discharge.

