Extracorporeal Membrane Oxygenation (ECMO) and Continuous Renal Replacement Therapy (CRRT): A Descriptive Review of Observations

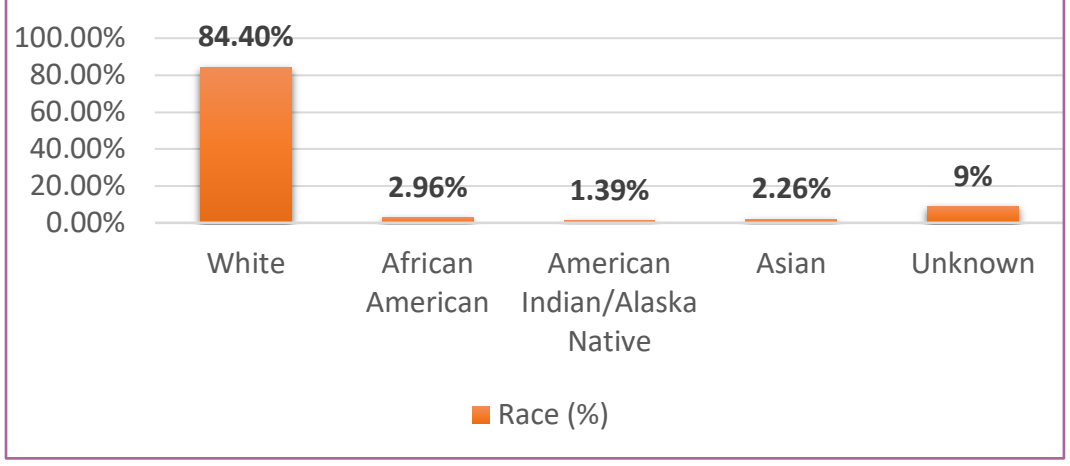
Santosh Subramanyam,MBBS, MD[1]; Hong Truong, MD[1], Christian Nguyen, MD[2], Nasrin Nikravangolsefid, MD[1], Aysun Tekin, MD[1], Supawadee Suppadungsuk, MD[1], Kianoush Kashani, MD[1]
[1]Mayo Clinic, Rochester, MN, [2]Mayo Clinic, Scottsdale, AZ

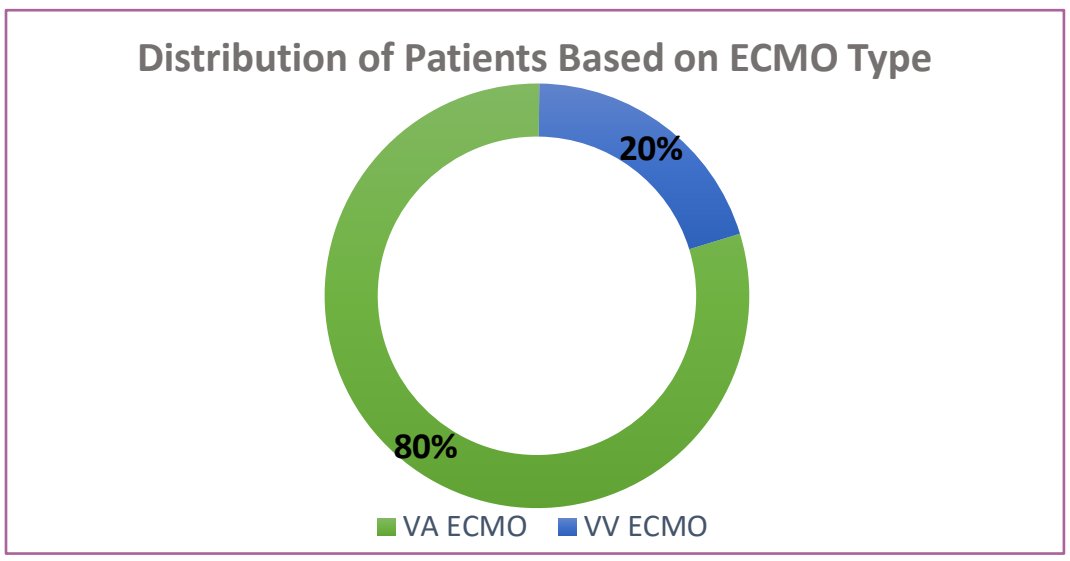
Introduction

- Continuous Renal Replacement Therapy (CRRT) is a slow dialysis process, especially for hemodynamically unstable patients.
- It is indicated for patients in the ICU to correct acid-base and/or electrolyte disturbances and to maintain the desired volume balance.
- There are various strategies employed in the United States about the modalities of CRRT, including those performing hemofiltration only (Continuous Veno-Venous Hemofiltration/CVVH), hemodialysis (Continuous Veno-Venous Hemodialysis only/ CVVHD) or a combination of both (Continuous Veno-Venous Hemodiafiltration/ CVVHDF).
- During the COVID-19 pandemic, we observed an uptake in the number of patients requiring Extracorporeal Membrane Oxygenation (ECMO) as salvage therapies for severe Acute Respiratory Distress Syndrome (ARDS) and patients with cardiac dysfunction with or without respiratory compromise.
- Often, these patients require ECMO and CRRT in various combinations to maximize the efficacy [1].
- Here, we analyze the different combinations of ECMO and CRRT, demographic data, incidence of hemolysis, mortality rates, and assess dialysis dependence after 120 days following hospital discharge.

Methods

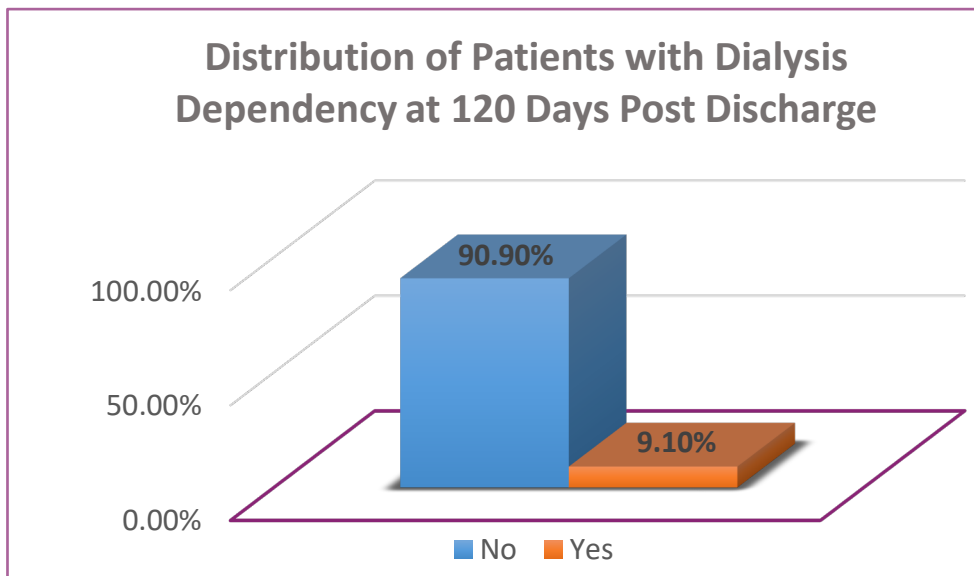
- This is a retrospective study involving all patients with CRRT and ECMO from 2018-2022.
- All patients on ECMO were initially screened, with subsequent exclusion of patients not requiring CRRT while on ECMO.
- Baseline demographics, including gender, age, race, diagnosis requiring CRRT, ECMO, and whether patients were already on CRRT before ECMO initiation, chronic Hemodialysis (HD), were obtained.

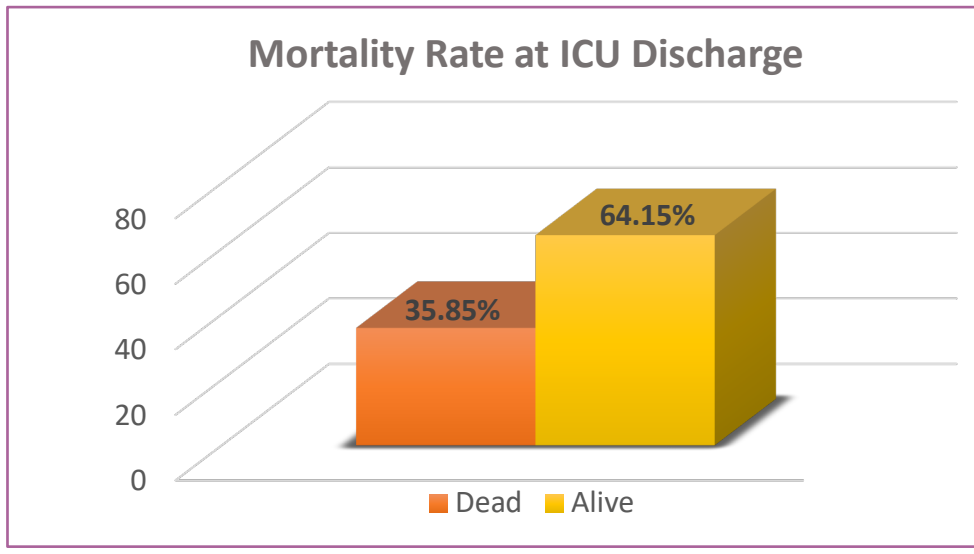




Results

- Electronic charts of 583 patients were analyzed.
- In this cohort, 79.9% were on Veno-Arterial ECMO (VA-ECMO), and 20.1% were on Veno-Venous ECMO (VV-ECMO).
- Of the 583 patients, 574 (84.4%) were White, 2.96% Black, 2.26% Asian, 1.39% American Indian or Alaska Native, while 9% were from other or unknown races. At ICU discharge, 64.15% were alive.
- The dialysis dependence at 120 days post-hospital discharge was 9.1%.





Discussion

- After analysis of patients on ECMO and CRRT, we found that most survivors were liberated from dialysis at the end of 120 days post-hospital discharge, while ICU mortality rates were 64%.
- This aligns with what was observed in other studies [1, 2]. The strength of this study is its larger sample size.
- The modifiable factors associated with kidney function recovery and ICU death are being evaluated.

References

1. Selewski, D.T. and K.M. Wille, Continuous renal replacement therapy in patients treated with extracorporeal membrane oxygenation. Semin Dial, 2021. 34(6): p. 537-549.
2. Deatrick, K.B., et al., Breathing Life Back Into the Kidney-Continuous Renal Replacement Therapy and Veno-Venous Extracorporeal Membrane Oxygenation. ASAIO J, 2021. 67(2): p. 208-212.

THE 29TH INTERNATIONAL CONFERENCE ON
ADVANCES IN CRITICAL CARE NEPHROLOGY
AKI & CRRT 2024
MARCH 12-15, 2024 SAN DIEGO, CALIFORNIA