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Etiologies of Acute Renal Failure during Mechanical Circulatory Support

Patients receiving mechanical circulatory support (MCS) frequently require renal replacement therapy (RRT). Examining risk factors for requiring RRT in patients receiving MCS may allow improved understanding of these comorbidities and enhance patient outcomes. Following IRB approval, patient characteristics, comorbidities, and the need for RRT were studied in 129 patients who received 159 MCS devices from January 2017 to October 2023. The clinical variables underwent machine learning to examine their relationships to the outcome of interest, the need for RRT. In our study the incidence of RRT was 36% with a 95% confidence interval ranging from 29-44%. Following machine learning, patients with a history of immunologic therapy pr having a pacemaker or internal cardiac defibrillator (ICDs) were associated with the need for RRT (Chi-square=44, P=0.0003). The c-index statistic for this model was 0.81. The anticoagulation therapy administered in these two groups was also analyzed. Patients in these two groups receiving unfractionated heparin (UFH) were observed to have a higher incidence (44%) in the need for RRT. The incidence of RRT was high in this patient population. The novel associations in patients requiring MCS who have received prior immunologic therapy or have pre-existing pacemaker/ICDs suggest that an increased systemic inflammatory state exists that escalates the need for RRT. Unfractionated heparin appears to provide minimal protection from the need for RRT in patients requiring MCS. These findings suggest that other options for systemic anticoagulation in patients requiring MCS should be considered. Further investigation into how these background inflammatory conditions contribute to the need for RRT in patients requiring MCS is warranted.

Keywords: Renal Replacement Therapy, Mechanical Circulatory Support

Biography

Kelsey Gore is an adult and pediatric ECMO Specialist at Ochsner Health in New Orleans, Louisiana. She completed her Master of Art in Biomedical Sciences and Master of Art in Education- Teaching Health Science in 2024 from Bluefield University, USA. She has her bachelor's degree in respiratory therapy in 2020 at Franciscan Missionaries University in Louisiana. She is an avid show jumper who competes on the national level.

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