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A New Paradigm: ECMO Therapy in Pediatric Hematology/ Oncology Patients

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A New Paradigm: ECMO Therapy in Pediatric Hematology/Oncology Patients

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IRB Number: STUDY00001444

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):

The presenting author for this project prepared and submitted the IRB protocol. In addition, he performed part of the data search and analysis. He also was responsible for writing the abstract for this submission.

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background:

The use of extracorporeal membrane oxygenation (ECMO) for support of pediatric patients has significantly increased in the past years. Patients with known oncologic diseases, immunodeficiencies, or bone marrow transplants (BMT) have traditionally not been considered candidates for Extracorporeal membrane oxygenation (ECMO) due to perceived high risk for mortality. Ongoing advances have continued to push the boundaries of ECMO use and we report our recent experience with this patient population

Objectives/Goal:

To evaluate survival to discharge of pediatric patients who require ECMO support and who also have an underlying hematologic or oncologic disease process. To determine specific patient characteristics that would affect morbidity and mortality for this particular patient population. To evaluate the effects of concomitant support therapies, such as CRRT or total plasma exchange (TPE), on survival to discharge.

Methods/Design:

Single center chart review cohort study involving 15 patients with a history of hematologic/oncologic diagnosis or bone marrow transplantation admitted to the PICU at Children's Mercy Hospital between 2015 and 2020 and who required ECMO for respiratory or hemodynamic support.

Results:

We identified 15 patients with ages ranging between 3 weeks and 16 years of age with both hematologic and oncologic diagnoses who required ECMO support between 2015 and 2020. The most common indications for ECMO support in these patients were acute respiratory distress syndrome and sepsis. The average ECMO support hours for our population was 336 hours. Eleven out of fifteen patients were supported with VA ECMO and one patient was converted from VV to VA during the hospitalization. We observed a 66.7% survival to decannulation and 60% to discharge. Of note, 40% of our patients had a history of bone marrow transplant (BMT) and the survival to discharge in this subgroup was found to be 66.7%. In tandem CRRT therapy did not seem to have an effect on survival. The population who received both CRRT and TPE in tandem therapy had a lower rate of survival.

Conclusions:

To our knowledge, this report is the largest single center cohort of pediatric hematology/oncology patients with a history of ECMO support. Our findings demonstrate a higher rate of survival to decannulation and discharge in this patient population than previously reported. In addition, a history of BMT did not increase the risk of mortality in our cohort. These findings would support the use of ECMO as a lifesaving therapy in this particular pediatric population.