Right ventricular dysfunction is common among pediatric patients with acute respiratory distress syndrome on venovenous ecmo

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Right Ventricular Dysfunction is Common among Pediatric Patients with ARDS on VV ECMO

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Introduction

- RV dysfunction is common in pediatric ARDS (~40% incidence) and associated with increased mortality.\(^1\,^2\)
- RV dysfunction typically improves on VV-ECMO with time
- New adult data shows some develop new or worsened RV dysfunction while on VV-ECMO and this is associated with worse outcomes.\(^3\)
- No data to our knowledge on this phenomenon in pediatric patients with ARDS on VV!

Methods

- Single center retrospective case series
- January 2010 – September 2022
- Inclusion criteria: Neonatal/pediatric patients on VV-ECMO for ARDS with an echo during ECMO run
- Exclusion criteria: single ventricle patients
- Echocardiogram reports were reviewed for evidence of qualitative RV systolic dysfunction, as well as other markers of RV injury including RV hypertrophy, dilation, and TAPSE scores
- Mann-Whitney U test used to compare differences between groups

Results

- 25 patients identified
- 20/25 (80%) survived to decannulation
- 19/25 (76%) survived to ICU discharge

  NEW RV injury seen in \( \frac{12}{25} (48\%) \)
  - 9/12 (75%) survived to decannulation and ICU discharge
  - 2/12 (17%) required conversion to VA-ECMO

  NO RV injury seen in \( \frac{13}{25} (52\%) \)
  - 11/13 (85%) survived to decannulation and 10/13 (77%) to ICU discharge
  - 1/13 (8%) required conversion to VA-ECMO

- 12/25 (48%) were extubated while on ECMO
  - 6/12 (50%) with RV injury
  - RV dysfunction more common among long run (>21 days) patients
  - 60% of long runs vs 40% of short runs
  - 9 survivors with RV dysfunction on ECMO
  - 7/9 had resolution of dysfunction post-ECMO
  - Time to resolution ranged from 1 to 181 days post-decannulation
  - 3 patients without RV dysfunction on echo had evidence of RV injury on autopsy or cardiac cath

Conclusions

New RV dysfunction is common among pediatric ARDS patients on VV-ECMO and persists after decannulation.

Echo alone may not be sufficient to diagnose clinically relevant RV injury.

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References