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BACKGROUND

- Early successful extubation from mechanical ventilation (MV) hastens recovery from critical illness
- In some cases, extubation failure (EF) occurs → urgent reintubation, resumption of MV
- Existing literature reports EF rates of 4-6% in general PICU populations, 8-12% in adult ICU patients
- Fluid overload (FO) and AKI contribute to prolonged MV, EF, and prolonged LOS in critically ill adults

The relationship between FO, AKI, MV and extubation outcomes in general pediatric populations and patients with severe FO/AKI necessitating CRRT are unknown

SPECIFIC AIMS

Describe duration of MV and rates of reintubation and EF in a multinational, multicenter cohort of critically ill children and young adults receiving CRRT

- Reintubation:** any patient who required a second intubation during admission regardless of timing
- EF:** any patient who required a second intubation within 72 hours of a planned extubation

To identify clinical factors associated with reintubation and EF in patients who have received CRRT in the PICU

METHODS

- Planned secondary analysis of data from the Worldwide Exploration of Renal Replacement Outcome Collaborative in Kidney Disease (WE-ROCK) registry
- Children/young adults receiving CRRT for AKI or FO at 32 centers across 7 countries
- Statistical analysis performed July-October, 2023
- Compared those requiring reintubation or experiencing EF to those successfully extubated in separate bivariate analyses
- Continuous variables reported as median with IQR, compared using Wilcoxon rank-sum tests
- Categorical variables reported as proportions with percentages, compared using Fisher's exact test and Pearson's χ^2 test as appropriate for individual variables
- 2-sided $p < 0.05$ considered statistically significant

RESULTS

- 1,016 patients in registry; 876 (86%) required MV
- 6.5% (50/769) were reintubated; 2.6% (20/768) experienced EF (Fig 1)**
- Non-white patients more likely to experience EF ($p=0.018$)
- Patients on CRRT at extubation were more likely to experience reintubation/EF ($p < 0.001$)
- Patients requiring reintubation had higher serum creatinine (SCr) at 90 days from CRRT initiation ($p=0.039$) and discharge ($p < 0.001$)
- 27% (7/50) of reintubated patients were treated with RRT at discharge ($p=0.09$)
- FO at initial extubation was not associated with reintubation ($p=0.478$) nor with EF ($p > 0.999$) (**Figure 2**)

FIGURE 1: TIME TO REINTUBATION

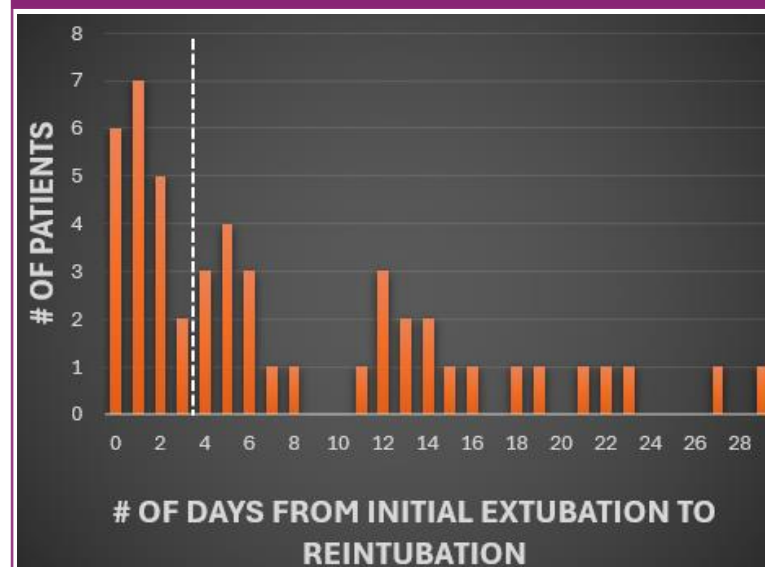


FIGURE 2: % FLUID OVERLOAD AT TIME OF INITIAL EXTUBATION

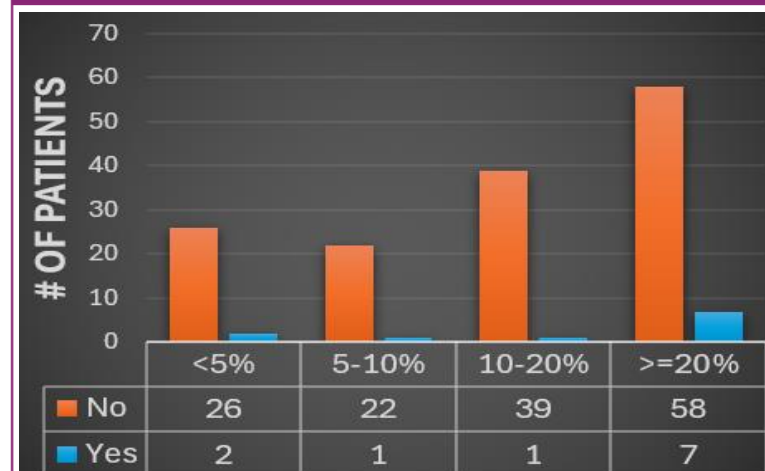
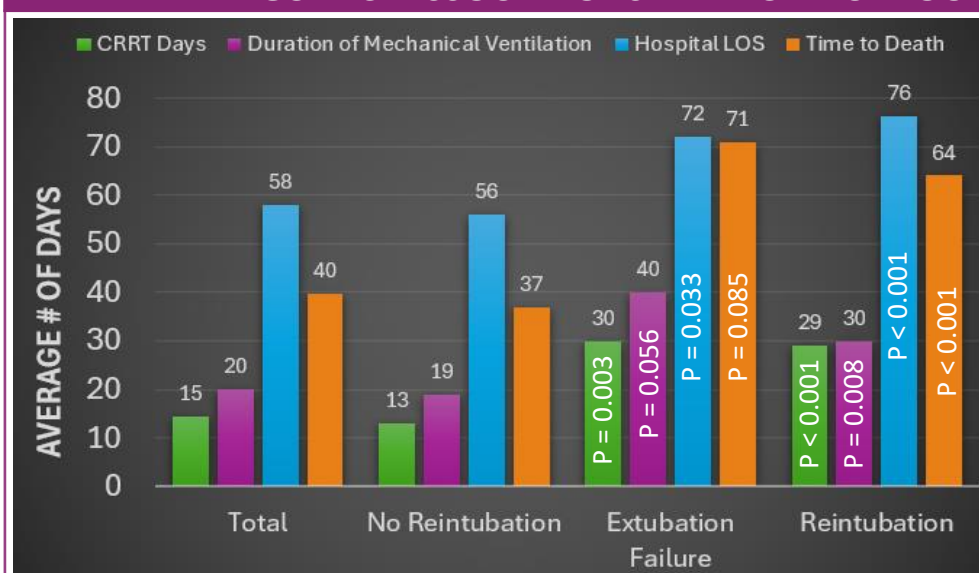


FIGURE 3: ASSOCIATIONS WITH CLINICAL OUTCOMES



- Reintubation associated with longer CRRT, MV duration, ICU and hospital LOS
- Time to death was almost twice as long in patients who were reintubated

DISCUSSION & CONCLUSIONS

- In a retrospective cohort database study of pediatric patients age < 25 years receiving CRRT for management of either AKI or FO, 6.5% were reintubated
- Those with AKI at time of initial extubation were more likely to experience reintubation, as were those not successfully liberated from CRRT
- Non-white race was significantly associated with EF
- First study investigating MV and extubation in this patient population



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