Anticoagulation Practices in Patients Requiring Aquapheresis in a Pediatric Cardiac Intensive Care Unit
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Introduction

- Patients on Aquapheresis require anticoagulation to maintain patency of the circuit and filter.
- The standard practice for patients receiving Aquapheresis is Heparin anticoagulation.
- Bivalirudin has been shown to have lower risk of bleeding and thrombotic events, with shorter time to reach partial thromboplastin time (PTT) goal levels for patients on extracorporeal membrane oxygenation (ECMO) or with ventricular assisted devices (VAD).
- At our institution, the anticoagulation of choice for patients on ECMO or with VADs is Bivalirudin.
- Although Heparin is the anticoagulation modality for Aquapheresis, when patients had therapeutic Bivalirudin anticoagulation at time of Aquapheresis initiation, we continued Bivalirudin anticoagulation for Aquapheresis therapy.
- In this study we aim to investigate the safety and feasibility of utilizing Bivalirudin as anticoagulation compared to Heparin in patients requiring Aquapheresis.

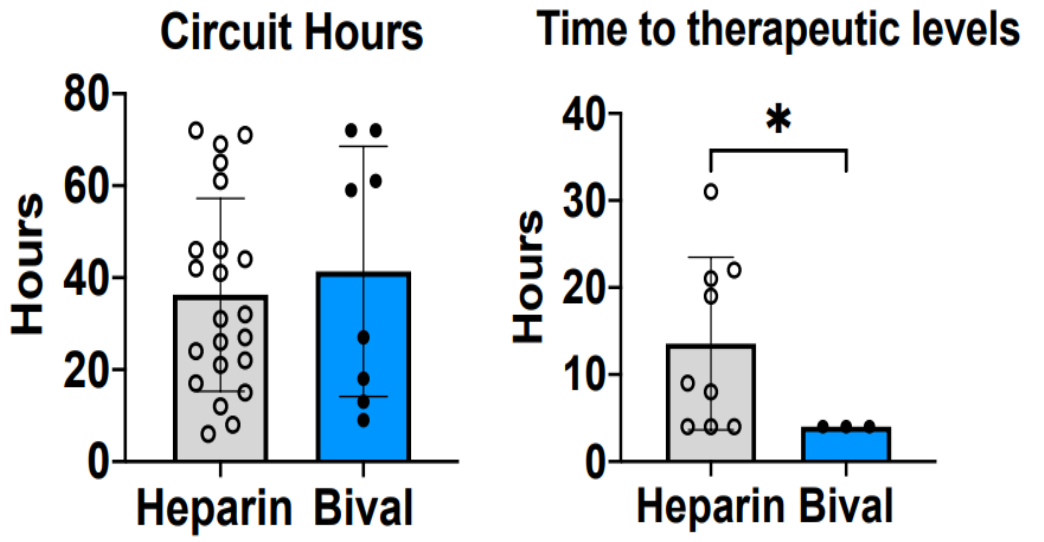
Methods and Materials

Patients receiving Aquapheresis in the cardiothoracic intensive care unit were reviewed retrospectively. We collected clinical data and investigated the factors affecting circuit duration, clotting, and bleeding events in patients treated with Heparin vs. Bivalirudin while on Aquapheresis.

Variable (median, range)	Heparin (n=9)	Bivalirudin (n=3)
Age	16 years (17 days-37 years)	22 days (21 days-26 years)
Gender	Females=5 Males=4	Females=2 Males=1
Indication	AKI/Fluid Overload=8 Fluid Overload=1	AKI/Fluid Overload=3

Results

- Indications for Aquapheresis were severe acute kidney injury and/or fluid overload.
- Nine patients were anticoagulated with Heparin, and three patients were anticoagulated with Bivalirudin.
- There were 27 circuits reviewed among the twelve patients.
- In the Bivalirudin group there were no systemic clotting or bleeding events.
- There was one clotting event with superior vena cava (SVC) thrombosis in the heparin group and no bleeding events.
- There was no significant difference between circuit hours when using Bivalirudin vs. Heparin for anticoagulation (mean 41.38 vs. 36.7 hours respectively).
- There was a significant reduction in hours required to reach therapeutic levels in patients receiving Bivalirudin compared to heparin (mean 4 vs. 13.46 hours, p = 0.02).



Conclusions

Our results suggest that Bivalirudin anticoagulation achieves therapeutic levels faster and is not inferior to Heparin anticoagulation for Aquapheresis therapy. Our study is retrospective and has very limited sample size, however, it highlights the potential benefit of Bivalirudin anticoagulation that needs further evaluation.

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