Intravenous Unfractionated Heparin dosing in obese patients in the Intensive Care Unit.

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Introduction

- Achieving therapeutic anticoagulation with unfractionated heparin (UFH) is challenging, particularly in obese patients who have a higher volume of distribution, thus requiring higher initial doses.
- Current Queensland Health UFH dosing nomogram utilizes patients' total-body-weight for dosing, with capped initial doses, which may lead to inadequate dosing in obese patients. Subsequent rate changes based on total-body-weight are uncapped, leading to inappropriately large dose changes.
- Intensive Care Unit (ICU) at Princess Alexandra Hospital is currently trialling a modified UFH nomogram for obese patients with higher initial doses and smaller infusion rate changes, developed by pharmacists in consultation with ICU consultants.

Aim: To report preliminary results on whether a modified nomogram leads to optimal UFH dosing in obese patients.

Method

- A retrospective observational audit was conducted of patients >120kg who received UFH in ICU using the modified nomogram compared to the standard nomogram.
- Primary outcome measured was time taken to reach therapeutic Activated Partial Thromboplastin Time (APTT) or greater.
- Secondary outcomes included number of patients with second APTT in Therapeutic Range (TR), proportion of APTTs in TR, and proportion of time in TR.

Results

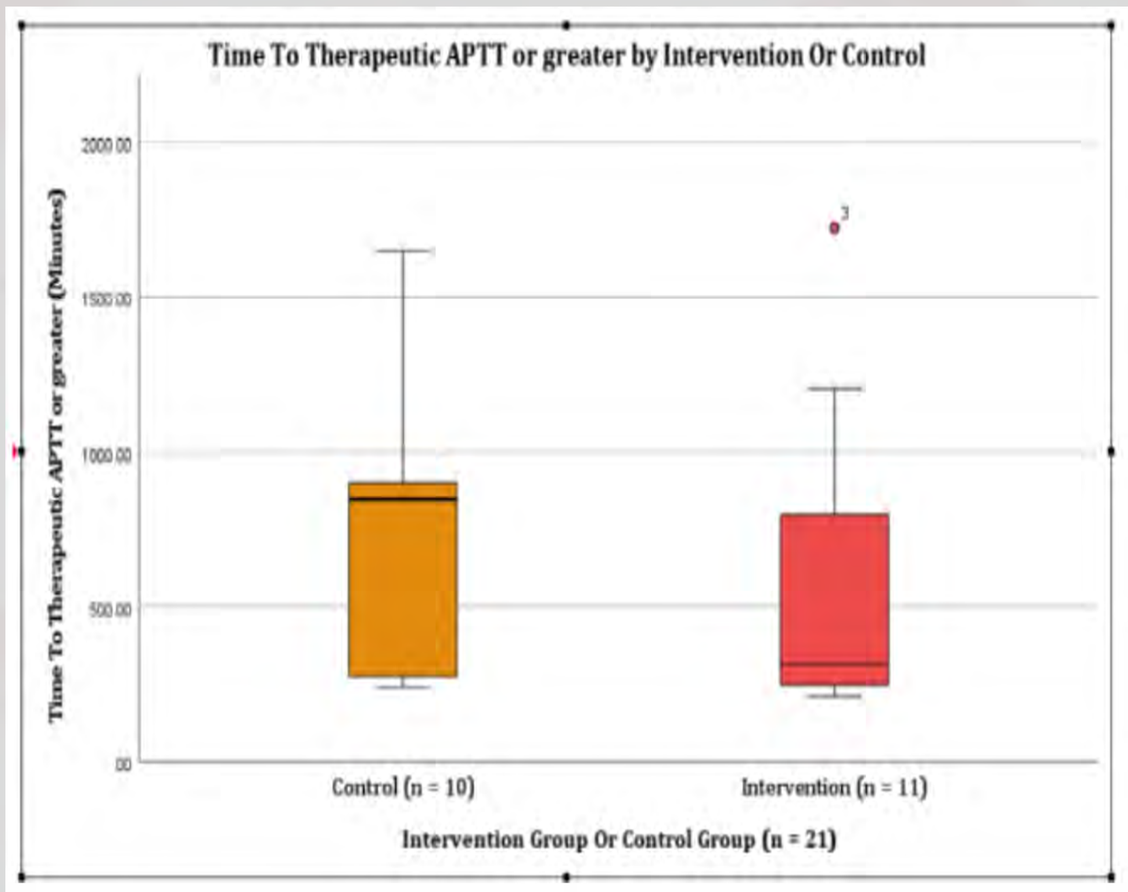
- Eleven patients who received the modified nomogram and ten patients who received the standard nomogram was audited.
- Modified nomogram led to a trend towards patients reaching therapeutic APTT slightly quicker (13.3 vs. 14.6 hours respectively).
- Time taken to reach therapeutic APTT or greater was much shorter with modified nomogram compared to standard nomogram (4.8 vs. 14.1hours respectively).
- Modified nomogram also led to improvements in secondary outcomes with no differences in bleeding.

Outcome	Intervention Group (n = 11)	Control Group (n = 10)	p-value
Primary Outcomes			
Time taken to reach therapeutic APTT (Minutes)	797.5 (237.5 - 1228.0)	875 (492.5 - 1387.5)	0.353
Time taken to reach therapeutic APTT or greater (Minutes)	315 (240.0 – 840.0)	847.5 (271.3 - 907.5)	0.223
Secondary Outcomes			
Number of patients with 2nd APTT in therapeutic range: n (%)	5 (45.5)	4 (36.4)	1
Proportion of all APTTs in therapeutic range (%)	70 (20.0 – 70.0)	48.6 (20.0 - 60.0)	0.349
Proportion of time in therapeutic APTT range (%)	40.9 (0.0 – 62.0)	15.6 (0.0 - 27.6)	0.173
Safety Outcomes			
Number of APTTs >200: n (%)	1 out of 109 (0.9)	1 out of 78 (1.3)	-
Number of patients with APTT >200: n (%)	1 (9.1)	1 (10)	-
Number of patients with bleeding events: n (%)	4 (36.4)	3 (30)	-

Table 1: Summary of Results

Primary outcomes, proportion of al APTTs in therapeutic range & proportion of time in therapeutic range are reported as median (interquartile range).

APTT: Activated Partial Thromboplastin Time



Conclusion: The modified nomogram appears to lead to more appropriate IV UFH dosing in obese patients, warranting continuation of this trial. Re-evaluation will be performed once 150-200 patients have been administered UFH using modified nomogram and results will be presented to state-wide anticoagulation working party for consideration to modify state-wide nomogram.