Background

- Therapeutic Hypothermia has shown to improve outcomes in cardiac arrest patients and is recommended for return of spontaneous circulation after an out of hospital cardiac arrest.1
- Hypothermia can have effects on metabolism and clearance of medications due to it slowing down temperature dependant enzymatic reactions.2 Heparin is one medication that may be affected by this decrease in metabolism.
- Current studies that evaluated the effect of hypothermia on aPTT levels showed that aPTT time was increased and that heparin may require dose adjustment in this patient population.3,4
- Currently there are no studies that evaluate Anti-Xa levels in patients undergoing therapeutic hypothermia.
- This study aims to evaluate heparin dose in patients undergoing therapeutic hypothermia.

Methods

- This study has been approved by St. Elizabeth Healthcare’s Institutional Review Board.
- Retrospective chart review identifying patients admitted into St. Elizabeth Edgewood, Florence and Fort Thomas during a 36-month period: – January 2013 to December 2015
- Inclusion Criteria: Patients 18 years or older, who underwent therapeutic hypothermia while also receiving continuous heparin infusion.
- Exclusion Criteria: Patients who did not have an Anti-Xa level drawn during hypothermia, patients younger than 18 years of age, hypercoagulable states such as cancer or antiphospholipid syndrome, or if patients did not reach goal temperature during hypothermia.
- Data Collection: Initial heparin rate, initial Anti-Xa levels during hypothermia, and any documented major bleeding events. Gender, age, and weight were assessed as possible covariates. Patients’ initial Anti-Xa values were evaluated as being sub-therapeutic, supra-therapeutic or in therapeutic range (0.3-0.7 IU/mL).

Study Objectives

- The primary outcome in this study was to analyze the initial heparin rate (units/kg) and it’s incidence of causing an elevated Anti-Xa levels among a patient population with acute coronary syndrome receiving both heparin and therapeutic hypothermia.
- A secondary outcome was to evaluate the incidence of bleeding in patients receiving the combination of heparin and therapeutic hypothermia

Results

- The initial heparin rate (units/kg) was shown to significantly increase the risk of producing a supra-therapeutic Anti-Xa value [P value: 0.006, Odds Ratio: 1.3972, Confidence Interval: (1.0584, 1.8445)].
- Estimated that each 1 unit/kg increase in the initial heparin rate increases the probability of event by a factor between 1.06 and 1.84
- 63.6% of patients had an initial supra-therapeutic Anti-Xa.
- 69% of patient had a supra-therapeutic Anti-Xa during hypothermia.
- The average heparin rate of all patients that had an initial Anti-Xa in therapeutic range was 11.2 units/kg/hr.
  - 10 received a bolus (Average: 48.6 units/kg)
  - After hypothermia, the average rate: 15.9 units/kg/hr
- The average heparin rate of all patients that had an initial Anti-Xa above range was 13.1 units/kg/hr.
  - 27 received a bolus (Average: 55.1 units/kg)
  - After hypothermia, the average rate: 17.8 units/kg/hr
- The average heparin rate of all patients at the conclusion of hypothermia was 10.0 units/kg/hr.
- None of the potential covariates were statistically significant (p-values 0.363, 0.511, and 0.322 respectively).
- No bleeding events were documented.
- Intend to submit final manuscript for publication.

References


Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

Brandon Fugate and Jillian Arrasmith: Nothing to disclose