New protocol using unfractionated heparin for radial-access percutaneous coronary intervention in acute coronary syndrome

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Background

- Bivalirudin and unfractionated heparin (UFH) are the two most commonly used anticoagulant medications in percutaneous coronary intervention (PCI)

- Trials have shown conflicting data regarding which anticoagulant is superior regarding efficacy and safety
  - ACUITY-ACS[1]: Bivalirudin similar in efficacy to UFH with significantly less bleeding
  - HORIZONS-AMI[2]: Decrease in all-cause and cardiovascular death but increased risk of stent thrombosis with bivalirudin
  - BRIGHT[3]: Decrease in adverse clinical events with bivalirudin over both UFH plus tirofiban and UFH alone
  - HEAT-PPCI[4]: Reduction in major adverse cardiac events (MACE) including acute stent thrombosis and reinfarction with UFH; no difference in bleeding
  - MATRIX[5]: Reduction in mortality and bleeding but increase in stent thrombosis with bivalirudin as compared to UFH

- Novant Health (NH) facilities utilized bivalirudin in approximately 90% of PCI cases prior to implementation of a new PCI protocol

- PCI protocol at NH was altered to employ heparin as the preferred anticoagulant agent in radial-access PCI in April 2015

Purpose

To evaluate outcomes associated with implementing a new PCI protocol using heparin as the preferred anticoagulant in radial-access patients

References

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Methods

Study Design
- Retrospective, single center, IRB-approved chart review
- Pre-implementation: April 2014 through July 2014
- Post-implementation: April 2015 through July 2015

Inclusion Criteria
- Patients ≥ 18 years of age
- ICD-9 and ICD-10 codes for ACS
- Radial-access PCI
- Pre-implementation group given bivalirudin during PCI
- Post-implementation group given heparin during PCI

Endpoints
- *Primary*: MACE at 30 days
- *Secondary*: (a) Incidence of major bleeding within 72 hours post-PCI; (b) Protocol compliance; (c) 30-day readmission; (d) Concurrent antithrombotic medication(s)

Analysis
- Wilcoxon-rank sum to evaluate continuous variables
- X^2 or Fisher's exact for categorical variables
- Alpha=0.05

Preliminary Results

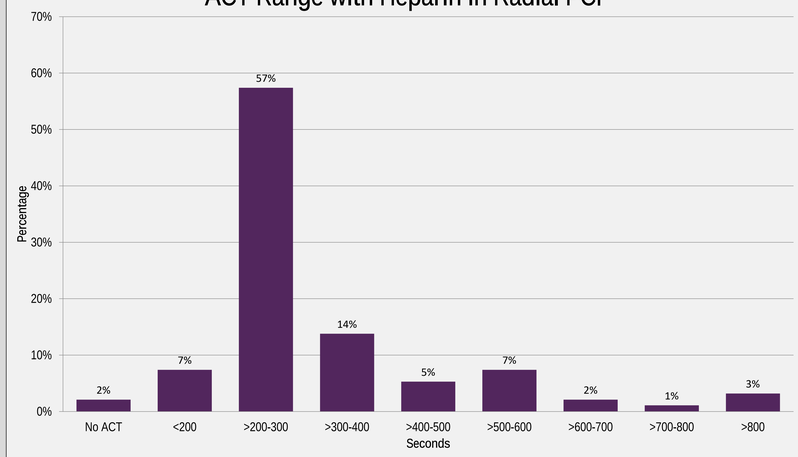
Bivalirudin utilization in 91% of PCI cases prior to implementation of new protocol; heparin utilized in 73% of cases post-implementation

Pre-implementation (n=91)	Post-implementation (n=106)
MACE at 30 days: 0.9% (n=1)	MACE at 30 days: 3.2% (n=3)
Major bleeding within 72 hours post-PCI: 8.5% (n=9)	Major bleeding within 72 hours post-PCI: 8.8% (n=8)

Preliminary Results

Non-adherence to protocol identified in 36.6% of cases post-implementation of which, 29.7% (n=11) were under dosed

ACT Range with Heparin in Radial PCI



Discussion

- New protocol of UFH as anticoagulant of choice appears appropriate

- Contrary to literature, increase in incidence seen with:
  - UFH: Stent thrombosis and reinfarction
  - Bivalirudin: Major bleeding within 72 hours post-PCI

- Continue UFH monotherapy for all radial cases

- Protocol adjusted based on findings of activated clotting time

Disclosure

The 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:

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