

Impact of Intravenous Cangrelor on Patients Undergoing High-Risk PCI: A Pilot Study

Brendon Clough, PharmD; Andrew Faust, PharmD, BCPS
Texas Health Presbyterian Hospital of Dallas, Dallas, TX; Texas Tech University Health Sciences Center, Dallas, TX

Abstract

PURPOSE: To determine the antiplatelet and anticoagulant requirements during PCI in patients receiving cangrelor versus prior standard therapy.

METHODS: This study is a retrospective analysis of high-risk myocardial infarction patients who underwent percutaneous coronary intervention (PCI) comparing medication requirements, costs, and outcomes in patients who received intravenous cangrelor versus prior standard therapy. Historical data were collected from January 1, 2018 to November 30, 2019 in patients who underwent prior standard therapy and from December 1, 2019 to present day in patients who received cangrelor. Inclusion criteria included age \geq 18 years, admission to Texas Health Presbyterian Hospital Dallas, primary PCI within 48 hours of acute coronary syndrome diagnosis, and presence of at least one high risk feature (intubation, hemodynamically unstable, high risk anatomy, or the use of either an intra-aortic balloon pump or Impella® device). Exclusion criteria included prior use of a P2Y12 inhibitor in the previous 7 days, CABG during hospitalization, lack of treatment with both aspirin and a P2Y12 inhibitor at time of diagnosis, thrombolytic use prior to procedure, lack of completion of PCI, treatment at another facility for > 24 hours before transfer. Information regarding concurrent medication use, stent location and quantity, restenosis, bleeding, ICU/hospital LOS, and mortality was collected on all patients. The primary outcome of the study was the difference in total medication exposure and costs during PCI between patients exposed to cangrelor compared to historical standard of care. Secondary outcomes included restenosis, clinically significant bleeding, ICU LOS, hospital LOS, and mortality.

RESULTS: After screening 160 historical patients, 29 patients met criteria for inclusion. Of these 29 patients, 11 (37.9%) received bivalirudin, 12 (41.4%) received eptifibatide, and 6 (20.7%) received both. There were no instances of restenosis or bleeding. 27 patients (93.1%) were admitted to the ICU after PCI. ICU and hospital length of stay were 3.0 and 4.3 days, respectively. The in-hospital mortality rate was 20.7%. Thus far, only 1 patient has received intravenous cangrelor. Further data collection and statistical analysis is pending.

CONCLUSION: Pending further data collection and statistical analysis.

Objective

To determine the antiplatelet and anticoagulant requirements during PCI in patients receiving cangrelor versus prior standard therapy

TTUHSC Jerry H. Hodge School of Pharmacy
Resident Research Virtual Poster Sessions
Contact: Brendon Clough; brendonclough@texashealth.org
8200 Walnut Hill Ln, Department of Pharmacy, Dallas, TX 75231

Methods

Retrospective, observational chart review
• Study time period: January 1, 2018 – May 31, 2020

- Inclusion Criteria**
- Age \geq 18 years old
 - Inpatient admission to Texas Health Dallas
 - Primary PCI within 48 hours of acute coronary syndrome diagnosis
 - Presence of at least one high-risk feature:
 - Intubation
 - Hemodynamic instability
 - Use of intra-aortic balloon pump or Impella®
 - High-risk anatomy

High-Risk Anatomical Features	
At least 3 of the following:	<ul style="list-style-type: none"> • Long lesion \geq 20 mm • Bifurcating • Thrombus • Eccentric • Angulated • Tortuous • Left main disease • Calcified • Multiple vessel lesions

- Exclusion Criteria**
- Prior use of P2Y12 inhibitor in last 7 days
 - CABG during hospitalization
 - Lack of treatment with P2Y12 inhibitor and aspirin
 - Thrombolytic use prior to procedure
 - Lack of completion of PCI
 - Treatment at outside facility for > 24 hours

- Outcomes**
- Primary:**
- Difference in total medication exposure and costs during PCI

- Secondary:**
- Restenosis
 - Clinically significant bleeding
 - ICU LOS
 - Hospital LOS
 - Hospital mortality

- Statistical analyses**
- Descriptive analysis only
 - Further statistical analysis pending increase in subjects receiving cangrelor

Baseline Demographics

Demographic	Standard (n=29)	Cangrelor (n=1)
Male - n (%)	22 (76)	1
Average age (years)	62	80
Average BP at start of PCI	114/69	96/51
Comorbidities - n (%)		
Smoking	18 (62)	1
Hypertension	16 (55)	1
Hyperlipidemia	14 (48)	1
Diabetes Mellitus	6 (21)	0
Previous MI	2 (7)	0
CHF	0 (0)	1

Demographic	Standard (n=29)	Cangrelor (n=1)
Intubated - n (%)	8 (28)	0
Use of vasopressors - n (%)	8 (28)	0
Impella device - n (%)	3 (10)	1
Intra-aortic balloon pump (IABP)	0	0
Stent Location - n (%)		
Right coronary	16 (55)	0
Left anterior descending	9 (31)	0
Circumflex	7 (24)	1
Posterior descending	1 (3)	0
Left main	1 (3)	1
Right posterolateral branch	1 (3)	0

Results – Medication Utilization

Medication	Standard (n=29)	Cangrelor (n=1)
Anti-platelets - n (%)		
Aspirin	28 (97)	1
Ticagrelor	22 (76)	1
Clopidogrel	7 (24)	0
Anti-coagulants - n (%)		
Heparin	29 (100)	1
Bivalirudin	13 (45)	0
G2B3A inhibitors - n (%)		
Eptifibatide	13 (45)	0

Results - Cost

Medication	Average Cost: Standard (n=29)	Average Cost: Cangrelor (n=1)
Heparin	\$8.02	\$8.02
Bivalirudin	\$52.43	\$0.00
Eptifibatide	\$40.35	\$0.00
Aspirin	\$0.06	\$0.06
Clopidogrel	\$0.23	\$0.00
Ticagrelor	\$8.94	\$11.79
Cangrelor	\$0.00	\$698.18
TOTAL:	\$110.03	\$718.05

Study Critique

- Strengths**
- Relatively new area of research
 - Trial assessed cost, safety, and clinical outcomes
- Limitations**
- Retrospective chart review
 - Small patient sample with descriptive data
 - Sequential study set-up (techniques/stents may improve over time)

Conclusions

- Stent thrombosis and bleeding uncommon, as seen in literature
- Room for decrease in bivalirudin and eptifibatide usage
- With associated price tag, cangrelor would need to show clear clinical benefit to be considered an alternative option

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