

Incidence of Gastrointestinal Hemorrhage Post Open Heart Surgery



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Background

- Gastrointestinal (GI) hemorrhage is a potentially fatal complication of open-heart surgery (OHS)
- Incidence of 0.39% reported in literature
- Mortality rates of 19-33%
 - Historical data that may not reflect current practice
- Incidence rates and risk factors are poorly characterized in cardiac surgery patients
- Cardiopulmonary bypass (CPB) thought contributory secondary to generation of microemboli, free radical production, hypo-perfusion of GI tract, and administration of intra-operative heparin
- Other proposed risk factors include:
 - Advanced age
 - Time spent on CPB, mechanical ventilation >48 hours
 - Chronic kidney disease
 - History of atrial fibrillation
 - Medications (eg. anticoagulants, antiplatelets)
- Proton pump inhibitors (PPI) and histamine-2 receptor antagonists (H2RA) are often prescribed to reduce the risk of GI hemorrhage following OHS despite a lack of evidence to support this practice

Objectives

- Primary objective:
 - Determine the incidence of GI hemorrhage within 90 days of OHS at Royal Columbian Hospital (RCH) while admitted within Fraser Health Authority (FHA)
- Secondary objectives:
 - Describe characteristics of patients experiencing GI hemorrhage post-OHS
 - Record the 30-day readmission rate for GI hemorrhage
 - Describe PPI and/or H2RA use in the context of GI hemorrhage

Methods

- Retrospective chart review from April 15 2015 – August 1 2019
- Inclusion criteria:
 - Patients ≥18 years old
 - History of OHS at RCH
 - GI hemorrhage within 90 days of OHS captured through ICD-10 codes
 - GI hemorrhage defined as: bleeding from the gastrointestinal tract requiring inpatient treatment

Patient Characteristics

Age (years)	71.76 ± 8.36
Male – no. (%)	125 (75.8)
CABG	78 (47.2)
Single valve replacement/repair – no. (%)	17 (10.3)
Combo cardiac procedure – no. (%)	68 (41.2)
Smoker – no. (%)	28 (17.0)
Heart Failure – no. (%)	33 (20.0)
Pre-existing Atrial Fibrillation – no. (%)	40 (24.2)
CKD – no. (%)	84 (50.9)
SSRI – no. (%)	12 (7.2)
Steroids – no. (%)	7 (4.2)
Median time on CPB – min. (IQR)	110 (81 - 157)
Median time to extubation post-OHS – h. (IQR)	11.4 (4.8 - 923.2)

Table 1: Characteristics of patients experiencing a GI hemorrhage within 90 days post-OHS (N= 165)

Results

- 4217 OHS cases recorded, 165 bleeds captured
- Incidence of GI hemorrhage at RCH:
 - Within 90 days post-OHS: 165 (3.9%)
 - Within 30 days post-OHS: 126 (3.0%)
- Median duration from OHS to GI hemorrhage: 16 (0 – 72) days
- Median time from discharge to readmission: 12 (2-63) days
- 30-day readmission rate within FHA for GI hemorrhage post-OHS: 1.0%
- Mortality due to GI hemorrhage: 12 (7.3%)

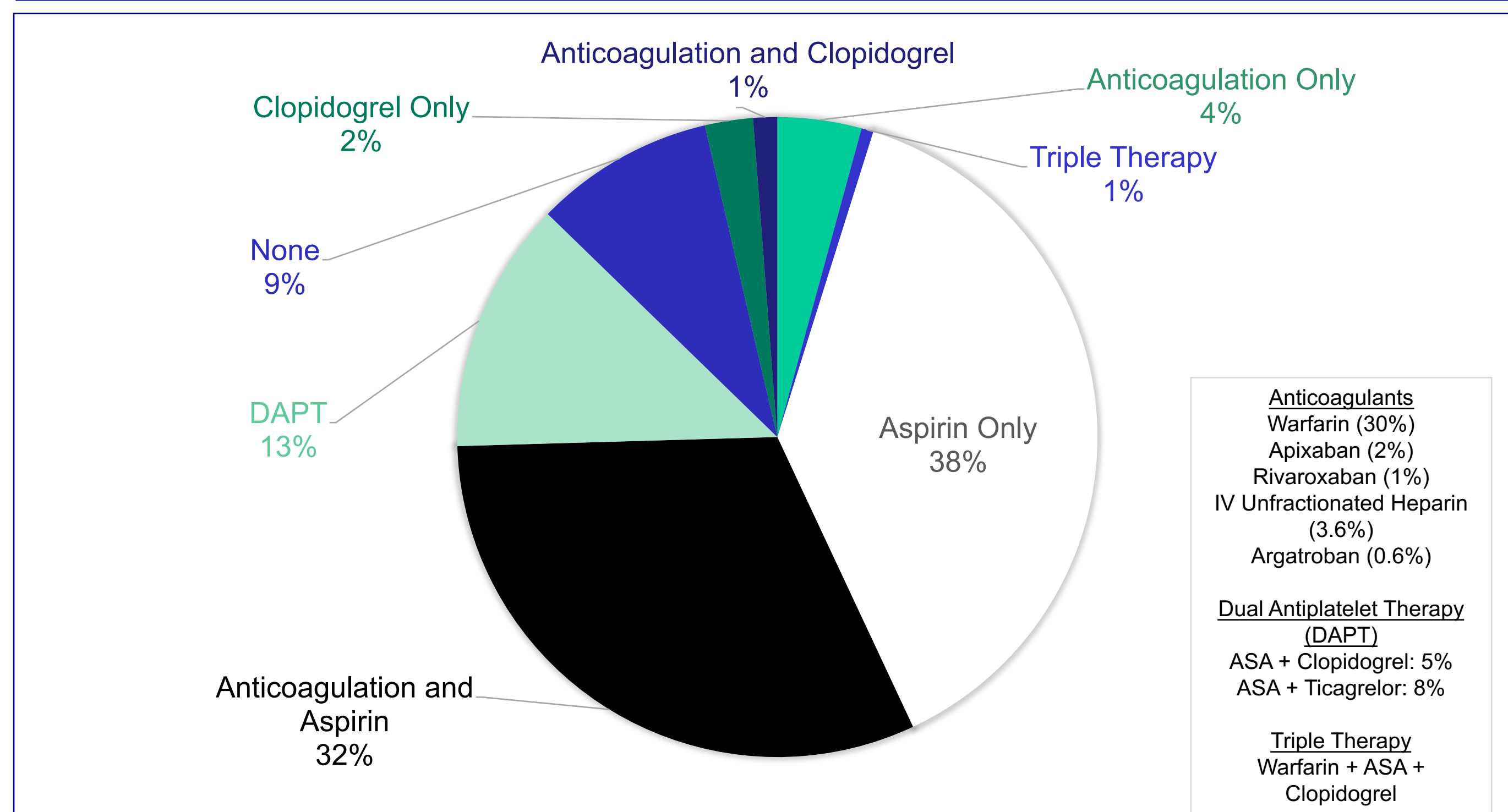


Figure 1. Antiplatelet and anticoagulation regimens for patients experiencing a GI hemorrhage

Median drop in hemoglobin – (IQR)	15.0 g/L (8 - 22.5)
Duodenal ulcer identified as source of bleed	99 (60.0%)
Endoscopic intervention – no. (%)	141 (85.5%)
• Transcatheter embolization – no. (%)	60 (36.4%)
• Injection therapy – no. (%)	60 (36.4%)
• Clips deployed – no. (%)	24 (14.5%)

Table 2: Management of GI hemorrhage

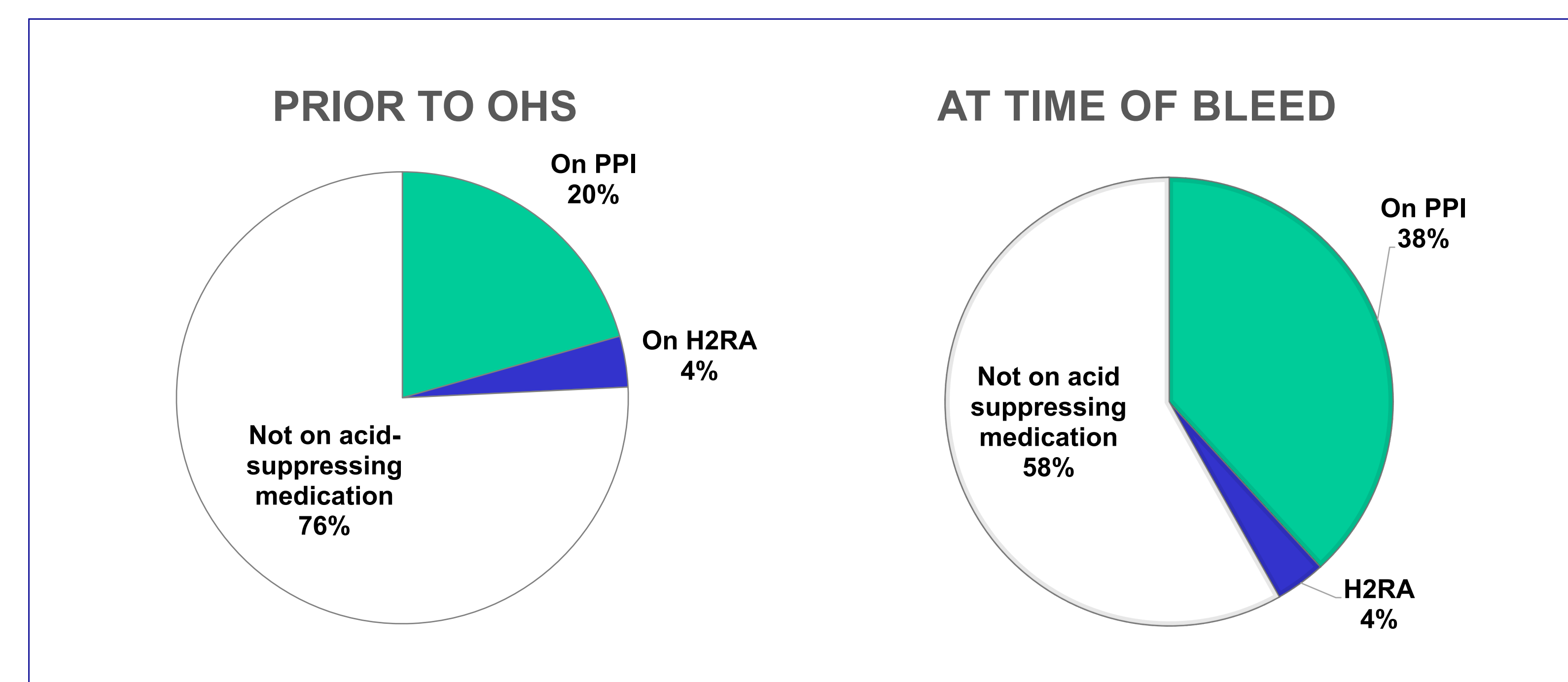


Figure 2. PPI and H2RA use in patients with GI bleed (N = 165)

Limitations

- No matched-cohort for comparison of risk factors
- Potential confounders include use of anticoagulation and/or antiplatelets (e.g. post-operative atrial fibrillation) and undocumented use of H2RA/PPI (e.g. over-the-counter agents, physician samples)
- Difficult to assess mortality causality
- Acid suppression therapy ordered at discretion of MD/NP
- Indication for PPI/H2RA often not documented
- Ability to capture GI hemorrhage limited to patients within the Fraser Health Electronic Medical Records (EMR)

Conclusions

- Incidence of GI hemorrhage post-OHS at RCH was higher than rates reported in the literature while overall mortality rate was lower
- 80% of patients included received either CABG or combination cardiac procedures
- 91% of patients included received antiplatelet and/or anticoagulation
- Matched cohort study would help to further explore potential risk factors
- A randomized controlled trial exploring the use of acid-suppressing therapy as GI prophylaxis in cardiac surgery patients would help to clarify this practice