Proton-Pump Inhibitor Infusion Misuse in the Community Hospital Setting

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Introduction

Proton pump inhibitors (PPIs) are the most potent acid suppressants available. Several studies have shown that in hospitalized patients with acute upper gastrointestinal (GI) bleeding from peptic ulcer disease, high-dose PPI therapy via continuous infusion reduces the rate of high-risk bleeding lesions (active bleeding, visible vessel, adherent clot) on initial endoscopy. While the benefits of PPI infusions have been clearly described for these specific indications, they are often over-prescribed to inpatients. Our study aim was to determine the rate of misuse in a tertiary care community hospital setting. Our secondary aim was to determine variables affecting PPI misuse.

Methods

A retrospective cohort study was conducted at Lankenau Medical Center, a 370 bed community hospital. Usage of pantoprazole infusion among hospitalized patients between March 1, 2020 and March 1, 2021 was extracted from the electronic medical record. Appropriate candidates for pantoprazole infusion were defined as patients with hematemesis, melena, coffee-ground emesis, or hematochezia with hemodynamic instability. All other indications were categorized as inappropriate. Variables including age, sex, race, serum hemoglobin at the time of PPI infusion initiation, and antiplatelet use, were collected. The rate of PPI infusion misuse was determined. Factors which significantly affected utilization of PPI infusion were determined through multivariate analysis.

Figure 1: Profile and Multivariate Analysis of PPI Infusion Misuse

	Inappropriate PPI Infusion			
	No	Yes	Total	
	n = 227	n = 121	n = 348	p
Age (Mean/SD)	67.6 (14.8)	71.1 (15.1)	68.8 (15.0)	0.04
Sex				0.571
Male	131 (57.7%)	66 (54.6%)	197 (56.6%)	
Female	96 (42.3%)	55 (45.5%)	151 (43.4%)	
Race				0.705
White	104 (46.0%)	59 (48.8%)	163 (47.0%)	
Black	112 (49.6%)	55 (45.5%)	167 (48.1%)	
Other	10 (4.4%)	7 (5.8%)	17 (4.9%)	
Ethnicity				0.12
Not Hispanic	225 (99.6%)	116 (97.5%)	341 (98.8%)	
Hispanic	1 (0.4%)	3 (2.5%)	4 (1.2%)	
Total # Antiplatelets				0.629
0	121 (53.3%)	58 (47.9%)	179 (51.4%)	
1	70 (30.8%)	41 (33.9%)	111 (31.9%)	
2	36 (15.9%)	22 (18.2%)	58 (16.7%)	
Antiplatelet Type (n = 169, "Yes" Respondents)				
Aspirin	103 (45.4%)	61 (50.4%)	164 (47.1%)	0.37
Clopidogrel	36 (15.9%)	23 (19.0%)	59 (17.0%)	0.456
Ticagrelor	4 (1.8%)	4 (3.3%)	8 (2.3%)	0.456
Prasugrel	1 (0.4%)	0	1 (0.3%)	1
Last Hemoglobin (Mean/SD, g/dl)	8.9 (2.6)	8.6 (2.9)	8.8 (2.7)	0.344
Missing Hemoglobin	19	8	27	
Transfusion Units (median/IQR)	2 (0-6)	2 (0-4)	2 (0-5)	0.478

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Results

A total of 348 pre-endoscopic PPI infusions were ordered during the one-year period. Approximately 35% of these prescriptions were ordered without an appropriate indication. The mean age of patients who were prescribed PPI infusions was 68.8 years. 48.6% were on an antiplatelet agent. The only significant variable between patients who were given a PPI infusion for an appropriate versus inappropriate indication was age, where the mean patient age was 68.8 compared to 71.1 years (p = 0.04). Patient sex, race, antiplatelet use, and hemoglobin value did not significantly affect PPI infusion misuse.

Discussion

Pre-endoscopic PPI infusion was prescribed inappropriately in 34.8% of patients in a community hospital setting over one year. Misuse of this drug leads to unnecessary healthcare costs and reflects poor understanding among prescribers of its appropriate clinically indicated uses. While PPIs are generally regarded as safe, misuse can increase the risk of adverse side effects. The impacts of anticoagulation use and provider specialty on misuse will be examined.