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### Practical use of blactchford score

Shawn E. Fellows

*St. John Fisher College, sfellows@sjfc.edu*

Jamie M. Rosini

*Christiana Care Health System*

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### Abstract

**Aim:** To retrospectively evaluate the use of proton pump inhibitor infusions.

**Methods:** A retrospective chart review was conducted of all patients who received an 80 mg bolus of esomeprazole follow by an infusion at 8 mg/hr. An analysis was performed to determine if a Blatchford Score of > 5 was a predictor of upper gastrointestinal ulcers.

**Results:** 300 patients received high dose esomeprazole over a 15 month period. 32% had an ulcer identified on endoscopy. Gastritis and esophagitis were the second most common diagnosis accounting for 16% of patients. A Blatchford Score of >5 as a predictor of upper gastrointestinal ulcers had a sensitivity of 86.5% with a specificity of 32%.

**Conclusion:** Utilizing the Blatchford Score to predict patients that have an upper gastrointestinal ulcer does not appear to be effective in clinical practice.

### Disciplines

Pharmacy and Pharmaceutical Sciences

### Comments

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**Keywords:** blatchford score, prevention, receptors, endoscopy

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Shawn E Fellows,<sup>1</sup> Jamie M Rosini<sup>2</sup>

<sup>1</sup>Wegmans School of Pharmacy at St. John Fisher College, USA

<sup>2</sup>Christiana Care Health System, USA

**Correspondence:** Shawn E Fellows, Clinical Pharmacist, Jordan Health: Brown Square and Woodward Assistant Professor, Department of Pharmacy Practice, Wegmans School of Pharmacy at St. John Fisher College, 3690 East Avenue, Rochester, New York, USA, Tel 585-254-6480 x1622, Email sfellows@sjfc.edu

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**Abbreviations:** PPIs, proton pump inhibitors; UGIB, upper gastrointestinal tract bleeding; ED, emergency department.

## Introduction

The role of proton pump inhibitors (PPIs) for the prevention of rebleeding in patients after therapeutic endoscopy for non-variceal upper gastrointestinal tract bleeding (UGIB) is well established. Acidic environments prevent platelet aggregation and coagulation as well as cause clot lysis,<sup>1,2</sup> therefore, raising the pH of gastric contents creates an environment suitable for both clot formation and stabilization. A sustained pH of 6 prevents clot lysis and allows for platelets to aggregate. Both proton pump inhibitors (PPIs) and histamine 2 receptor antagonists raise gastric pH, however, only PPIs have the desired potency to achieve a sustained pH of 6.<sup>3,4</sup>

Initial studies evaluating PPIs for suspected UGIB failed to illustrate clinical benefits.<sup>5</sup> In these studies, endoscopy was not utilized as a treatment modality; rather, it was used solely as a diagnostic tool. Haemostasis with endoscopy is the treatment of choice for non-variceal UGIB as it has shown to reduce bleeding and the need for surgery, as well as decrease mortality.<sup>6,7</sup> Later study initiating high dose PPIs as a bolus and 72 hour infusion post-therapeutic endoscopy showed a decrease in re-bleeding.<sup>8</sup> Further studies showed that initiating a PPI bolus and infusion prior to endoscopy resulted in decreasing oozing at the site of the ulcer and a reduction in the need for endoscopic therapy without affecting other clinical outcomes.<sup>9,10</sup> The authors suggested that high risk patients with suspected non-variceal UGIB may benefit from high dose PPIs prior to endoscopy.

High risk patients with UGIB who may benefit from PPIs prior to endoscopy is challenging. The Blatchford Score was created to identify high risk patients who may require intervention.<sup>11,12</sup> Although a Blatchford Score of greater than zero has shown to good sensitivity for determining high risk patients, it lacks the specificity to make it useful in clinical practice.<sup>13,14</sup> The objective of this study was determine if patients are appropriately receiving PPIs for suspected UGIB in the emergency department (ED) and to evaluate the sensitivity and specificity of a Blatchford Score of >5 as a predictor of patient with UGIB ulcers.

## Methods

This was a retrospective review of patients who received a PPI bolus and infusion while in the ED at a busy community hospital who receives >95,000 visits annually. Patients were identified through a pharmacy medication records database. Information was retrospectively collected over a 15 month period. To be included in the study, patients must have received an 80mg bolus of esomeprazole and been initiated on an esomeprazole drip at 8mg/hr while in the ED. Esomeprazole was chosen as this was the formulary PPI agent during the time of study. Patients were excluded from the study if care was withdrawn or had advanced directives that precluded them from receiving invasive procedures or dictated conservative care measures. This study was approved by the institutional review board.

To be classified as appropriate, patients had to have an upper gastrointestinal ulcer identified upon endoscopy during their inpatient stay or in the ED. When an endoscopy did not identify an ulcer or when a patient did not undergo endoscopy, they were classified as inappropriate. Subsequently, these patients were categorized into several categories based on the endoscopic findings or as not having an endoscopy: variceal upper GI bleed, gastritis or esophagitis, endoscopy not done, normal upper gastrointestinal tract, or other (*i.e.*: hiatal hernia, atriovenous malformation).

For each patient, all scoring components of the Blatchford Score were collected (Table 1). At the conclusion of data collection, a Blatchford Score was calculated for each patient. A 2x2 table was constructed to determine the sensitivity and specificity of a Blatchford Score of >5 as a predictor of the presence of an upper GI ulcer. The definitive diagnosis of an ulcer was made through retrospective review of patient's charts and upper GI endoscopy reports. Patients that did not undergo upper GI endoscopy were considered not to have an ulcer present.

The primary objective of this study was to determine the number of patients that received an esomeprazole bolus of 80 mg followed by an infusion at 8mg/hr and had an upper GI ulcer identified upon endoscopy. A secondary objective of this study was to determine the sensitivity and specificity of a Blatchford Score of >5 for identifying patients with an upper GI ulcer.

**Table 1** Blatchford Score were collected

Risk marker	Score component value
<b>Blood urea nitrogen (mg/dL)</b>	
>18.2to <22.4	2
>22.4 to<28	3
>28 to< 70	4
>70	6
<b>Hemoglobin men (g/dL)</b>	
>12 to <13	1
>10 to <12	3
<10	6
<b>Hemoglobin women (g/dL)</b>	
>10to<12	1
<10	6
<b>Systolic blood pressure (mmHg)</b>	
>100to<109	1
>90to99	2
<90	3
<b>Other markers</b>	
Pulse Rate >100 Beats/Min	1
Presentation with Melena	1
Presentation with Syncope	2
Hepatic Disease	2
Heart Failure	2

### Results

Over a 15 month period 313 patients were initiated on an 80mg bolus of esomeprazole followed by an infusion at 8mg/hr. Of these patients, 13 were excluded due to withdrawal of care or an advance directive prohibited them from undergoing upper GI endoscopy. The median time to endoscopy was 19.5 hours and ranged from 1 to 433.5 hours. In the remaining 300 patients an ulcer was found during an upper GI endoscopy in 96 (32%) patients (Figure 1). Among the patients that an ulcer identified, 31 (10.3%) required intervention such as cauterization and/or epinephrine injections to stop bleeding. The most common finding upper GI pathology found in patients that did not have an ulcer was gastritis or esophagitis, followed by variceal UGIB at (16%) and (12%) respectively. Sixteen percent of patients

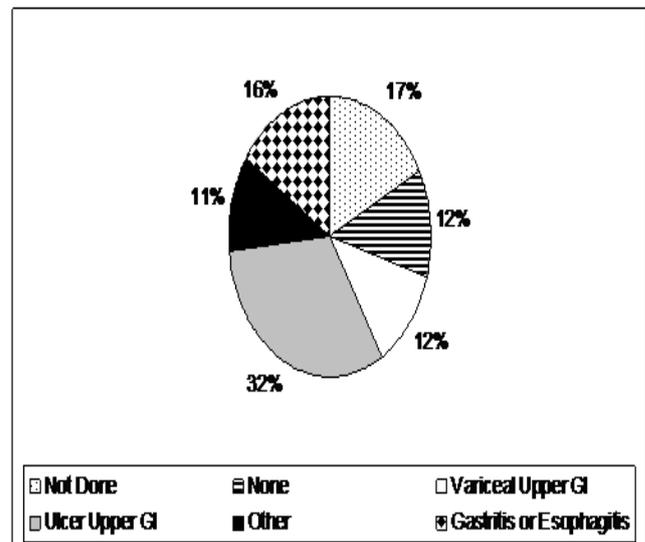
did not undergo an upper GI endoscopy while present in the ED or during their inpatient stay.

The median Blatchford Score calculated was 8 and ranged from 0 to 20 (Figure 2). A Blatchford Score of >5 correctly predicted an ulcer in 84 patients (Table 2). The sensitivity of a Blatchford Score >5 for predicting an ulcer in patients the received an esomeprazole bolus and infusion while in the ED was 86.5% with a specificity of 32%.

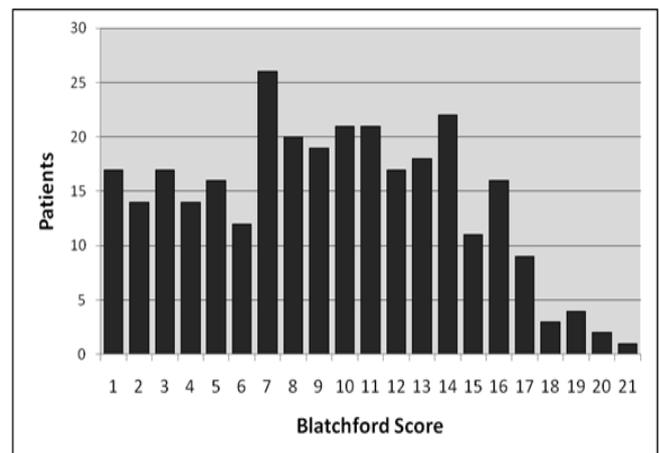
**Table 2** A Blatchford Score of >5 correctly predicted an ulcer in 84 patients

		Endoscopic findings	
		Ulcer	No ulcer
Blatchford	>5	84 (TP*)	138 (FP*)
Score	<5	13 (FN*)	65 (TN*)
Total		97	203

\*True Positive (TP); False Positive (FP); False Negative (FN); True Negative (TN)



**Figure 1** 300 patients an ulcer was found during an upper GI endoscopy in 96 (32%) patients.



**Figure 2** The median Blatchford Score calculated was 8 and ranged from 0 to 20

## Discussion

A PPI bolus and infusion after therapeutic endoscopy reduces the rate of re-bleeding among patients with upper GI ulcers. In high risk patients, a bolus and infusion prior to endoscopy reduces the need for endoscopic intervention and the signs of bleeding. Determining which patients are at high risk is difficult. Only 32% of patients over a 15 month period received an esomeprazole bolus and infusion while in the ED had an ulcer. Almost 30% of patients did not have any upper GI pathology present or did not undergo endoscopy.

The administration of PPIs is not without risk. Chronic acid suppression has been associated with life threatening electrolyte abnormalities.<sup>15</sup> Critically ill patients receiving acid suppression for stress ulcer prophylaxis are at increased risk for respiratory infections.<sup>16–18</sup> Additionally, the use of PPIs has been associated with the development of *Clostridium difficile* infections.<sup>19–21</sup> Recent studies have suggested that there is a dose response relationship with administration of PPIs and that risk of *Clostridium difficile* infection can develop in as soon as three days with PPI therapy.<sup>22,23</sup> Inappropriate administration of high dose PPIs in the ED could place patients at an increased risk for the future development for *Clostridium difficile* infections later in their hospital course.

Variceal upper GI bleeding was the second most common diagnosis among patients reviewed. Potential treatment options for patients with variceal bleeding include the use of somatostatin analogues and band ligation.<sup>23</sup> High dose PPIs in combination with octreotide, a somatostatin analogue, in patients with variceal bleeding has not shown benefit in regards to patient outcomes or transfusion requirements.<sup>24</sup> Providers often initiate PPI bolus and infusions empirically in patients with presumed variceal bleeding despite the lack of proven benefit. Of the patients in our study that were found to have variceal bleeding, none had concomitant upper GI ulcers and were therefore unlikely to have received additional benefit from the use of high dose esomeprazole. In the future, exclusion of patients with variceal bleeding may reduce the unnecessary use of high dose PPIs.

This study identified that more objective criteria is needed to identify patients at high risk for upper GI ulcers. The Blatchford Score was developed to identify patients that required treatment to manage their bleeding.<sup>12,13</sup> While this scoring system has been identified by some practice guidelines as a tool for identifying patients that may require intervention,<sup>25</sup> its usefulness in clinical practice may be limited.<sup>13,26,27</sup> In our study we attempted to evaluate whether a Blatchford Score of >5 would predict patients that would have an ulcer identified upon endoscopy. Previous studies have shown that scores of 5 or greater may an appropriate threshold for which patients may require intervention.<sup>12,26</sup> In our study, a sensitivity analysis revealed that the Blatchford Score of >5 would identify most patients with upper GI ulcers but had a specificity of only 32% which limits its application in clinical practice.

Several limitations exist in this study. Patients were included in this study were initiated on an esomeprazole bolus and infusion while in the ED regardless of whether they were continued on the infusion if they were admitted to the hospital. Therefore the duration of the infusion was not taken into account when evaluating their use, although this was unlikely to have influenced the incidence of identifiable ulcers. In addition our study included all patients in the ED that had received a bolus and infusion of esomeprazole over a

15 month period which represented a relatively non-specific patient population. More stringent exclusion criteria may provide better results in future studies evaluating the utility of the Blatchford Score. As the patients in our study were initiated on therapy in the ED, results may differ for inpatients initiated on high dose PPIs.

## Conclusion

The findings of our study illustrated that only 32% of patients in the ED initiated on high dose esomeprazole had an ulcer identified on endoscopy. A Blatchford Score of >5 may not be helpful in determining high risk patients who may benefit from a PPI bolus and infusion prior to endoscopy. Future study is needed to identify objective criteria that can help detect patients that could benefit from PPIs prior to endoscopy.

## Acknowledgements

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## Conflict of interest

The author declares no conflict of interest.

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