

## Assessing Utility and Efficacy of Bleeding Care Unit (BCU) in the Management of Upper GI Bleeding

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Conflict of interest: Nil

### Abstract

**Aim:** The aim of the present study was to study the utility and efficacy of bleeding care unit (BCU) in the management of upper GI bleeding.

**Methods:** The present study was conducted in the Department of Gastroenterology for one year and collected the data of all upper GI bleeding patients admitted in bleeding care unit. A total of 200 patients were admitted with UGI bleed. The data collected for both the groups of patients included the history, examination, laboratory investigations, and different outcomes.

**Results:** Of the 200 patients studied, 50 belonged to pre-BCU group and 150 patients were admitted in BCU. 20 and 60 patients had comorbid illnesses in both groups respectively. Maximum patients had esophageal variceal bleed. The length of days and time to endoscopy were found to be significant. The mean (SD) time from admission to EGD improved after implementation of BCU and pathways from 21.3 (7.4) to 9.42 (9.9) hours.

**Conclusion:** We found that BCP implementation in UGI bleeding management was useful if practiced over longer time period.

**Keywords:** Gastrointestinal bleeding, Outcome research, Quality of care

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### Introduction

Upper gastrointestinal bleeding (UGB) is defined as the intraluminal bleeding proximal to the Treitz ligament. [1] Regarding the etiology, can be classified as nonvariceal and variceal UGB. Hematemesis and melena are signs and/or symptoms of UGB. The cause of UGB may be established in approximately 80% of cases, and the most frequent diagnoses are peptic ulcers (37%-55%), gastroduodenal erosions (6%-24%), esophageal varices (10%-23%), esophagitis (4%-6%) [2] Patients with acute upper gastrointestinal (GI) bleeding commonly present with hematemesis (vomiting of blood or coffee-ground-like material) and/or melena (black, tarry stools). Mortality due to upper GI bleeding was found to be 7% among new admissions, rising to 30% in those who bled as inpatients. [3] UGIB refers to bleeding from any point proximal to the duodenojejunal flexure. It presents clinically with haematemesis and/or melaena. Fresh bleeding per rectum is usually indicative of lower GI bleeding, however massive UGIB can present with passing of red blood clots rectally. Causes of UGIB can be classified in two ways. The first is based on the underlying pathophysiological mechanism. The second is based on the type of bleed—i.e. variceal or non-variceal. [4] Bleeding from upper GI tract is 4 times as common as bleeding from lower GI tract.

The initial evaluation of patients with acute upper GI bleeding involves an assessment of hemodynamic stability and resuscitation if necessary. Diagnostic studies (usually endoscopy) follow, with the goals of diagnosis, and when possible, treatment of the specific disorder. Clinical care pathways have been proposed for diseases that are frequent causes of hospitalization; they are particularly used for diseases which are expensive to treat and have a high variation in the approach to diagnosis and treatment. [5,6] The management of upper GI bleeding meets all these criteria and therefore qualifies for the need of a pathway. Clinical care pathways, also known as critical paths, care paths, and critical pathways, are management plans that display goals for patients and provide the sequence and timing of actions necessary to achieve these goals with optimal efficacy. [7] There is no local or regional report on the development and impact of clinical care pathways in management of upper GI bleed. In order to investigate the impact of bleeding care pathway (BCP) on improvement in upper GI bleeding care and outcomes.

The aim of the present study was to study the utility and efficacy of bleeding care unit (BCU) in the management of upper GI bleeding.

## Materials and Methods

The present study was conducted in the Department of Gastroenterology, PARAS, HMRI Hospital, Patna, Bihar, India for one year and collected the data of all upper GI bleeding patients admitted in bleeding care unit. A total of 200 patients were admitted with UGI bleed. The data collected for both the groups of patients included the history, examination, laboratory investigations, and different outcomes. Success of BCP was assessed and compared with pre-BCU admissions for the following variables: (1) time between admission and upper GI endoscopy, (2) length of pre-BCU/BCU stay, (3) total hospital admission, and (4) mortality.

All patients with upper GI bleed (variceal and non-variceal) with a high risk [8] were admitted from the ER to BCU. The BCP was started in all these patients. Patients not meeting the criteria were admitted in general medical wards of our hospital.

### GI Bleeding Care Pathway

The pathway management started from ER and ended on the fifth day of admission or earlier if patient was discharged. The parameters were recorded in patients staying for more than 3 days in BCU or overall stay was extended beyond 5 days.

The BCP has components of ER, BCU, and ward management of patients with upper GI bleed. It comprises components of patient's daily assessment, along with GI endoscopy report, and medications information. BCP was terminated earlier if: (1) patient was shifted to medical intensive care unit (ICU) for mechanical ventilation, (2) patient shifted to coronary care unit (due to active ischemic heart disease including myocardial infarction), and/or (3) angiographic embolization for non-variceal bleed, (4) trans jugular intrahepatic portosystemic shunt (TIPSS) for variceal bleed, or (5) underwent a surgical procedure for upper GI bleed, after failure of endoscopic intervention(s) for hemostasis. The BCU setup for the management of GI bleeding was approved from the hospital operation team (HOT) committee of our hospital.

## Management of Upper Gastrointestinal Bleed

All the patients in pre-BCU and BCU era received a standardized medical and endoscopic treatment after initial resuscitation with intravenous fluids and packed cells transfusion as needed. Omeprazole was used in infusion form (80 mg IV stat followed by 8 mg per hour until EGD) or 40 mg IV infusion twice a day based on the physicians' discretion in high risk patients. [9] Parenteral omeprazole was converted to oral after finding a low risk lesion on EGD based on Forrest classification of ulcer or after ensuring hemostasis based on clinical judgment along with stabilization of hemoglobin in 48 h. Splanchnic vaso- constrictors, like terlipressin and octreotide were regularly used based on clinical grounds. Octreotide infusion was used in standard dose of 100 mcg stat followed by 50 mcg per hour infusion for 72 h in all the patients with known cirrhosis or suspected variceal bleeding. Terlipressin was given as 2 mg IV followed by 1 mg every 6 hourly for 72 h in esophageal variceal bleed. [10,11] The endoscopic intervention in non-variceal bleeding included a combination of injection sclerotherapy and heater probe coagulation in all patients with high risk ulcer according to Forrest classification. Sclerotherapy was performed with adrenaline in a concentration of 1:10,000 up to 6–12 mL in aliquots injected in and around the ulcer. [12,13] Esophageal variceal bleed was managed with endoscopic band ligation (EBL; Saeed Multi Band Ligator, Wilson-Cook, USA). [11]

### Statistical Analysis

Data are presented as mean (SD) or number (%) as applicable. Differences in proportions were assessed by using the Chi-square test or Fisher exact test wherever appropriate. For continuous variables, one way analysis of variance and independent sample t-test were used to assess the difference of means. All analysis were done using SPSS (version 14.0). All p-values were two-sided and considered as significant if <0.05.

### Results

**Table 1: Characteristics of patient admitted before and after start of bleeding care unit**

Variables	Pre-BCU n=50	BCU n=150	p-value
Age (years) (mean [SD])	55.5 (14)	53.7 (14.6)	0.25
Male	32	105	0.66
Comorbid illnesses	20	60	0.84
Transfusion	36	110	0.54
Average number of blood products (mean [SD])	2.7 (0.8)	2.9 (0.6)	0.64
Causes of UGI bleed			
Esophageal variceal bleed	26	90	0.007
Non-esophageal variceal bleed	20	48	
Both EV and non-EV bleed	2	7	
No source of bleeding identified	2	5	

Of the 200 patients studied, 50 belonged to pre-BCU group and 150 patients were admitted in BCU. 20 and 60 patients had comorbid illnesses in both groups respectively. Maximum patients had esophageal variceal bleed.

**Table 2: Comparison of various outcome measures of patients**

Variables	Pre-BCU	BCU	p-value
Length of stay (days)	2.41 (1.4)	2.38 (1.3)	<0.001
Total hospital stay (days)	4 (2.08)	3.58 (2.2)	0.08
Time to endoscopy (hours)	21.3 (7.4)	12.2 (11.5)	<0.001
Outcome (survived)	109 (90.1)	106 (90.6)	0.15

The length of days and time to endoscopy were found to be significant.

**Table 3: Comparison of overall outcome variables in pre-BCU and BCU period**

Variables	Pre-BCU	BCU	p-value
Time between admission and endoscopy (hours)	21.3 (7.4)	9.42 (9.9)	<0.001
BCU length of stay (days)	2.41 (1.4)	1.93 (1.3)	<0.001
Length of hospital stay (days)	4 (2.08)	4.13 (2.62)	0.58
Survival (n [%])	109 (90.1)	402 (93.5)	0.20

The mean (SD) time from admission to EGD improved after implementation of BCU and pathways from 21.3 (7.4) to 9.42 (9.9) hours.

### Discussion

Acute upper gastrointestinal (UGI) bleeding remains one of the most commonly encountered GI emergencies. UGI bleeding affects approximately 0.7–1.5 per 1,000 of general population in the United States annually. [14,15] Despite the high frequency of GI bleeding, guidelines to provide quality medical treatment in a standardized fashion are not well established in resource poor countries. Variations in treatment have been noted among various hospitals; furthermore, differences exist in its monitoring, timing of endoscopy, length of the hospital stay, and outcomes even within a single hospital. [16] Clinical care pathways have been proposed for diseases that are frequent causes of hospitalization; they are particularly used for diseases which are expensive to treat and have a high variation in the approach to diagnosis and treatment. [17,18]

Of the 200 patients studied, 50 belonged to pre-BCU group and 150 patients were admitted in BCU. 20 and 60 patients had comorbid illnesses in both groups respectively. Maximum patients had esophageal variceal bleed. The length of days and time to endoscopy were found to be significant. The mean (SD) time from admission to EGD improved after implementation of BCU and pathways from 21.3 (7.4) to 9.42 (9.9) hours. Pathways propose an idea that transforming the care of all patients in the same manner may impact the outcome. The pathways are used in patient care with a varied success in different disease states. [19,20] In clinical practice, pathways were used initially in the management of patients in coronary care units. The role of BCPs in management of GI bleed is insufficient. There are a few studies

with limited success in management of upper GI bleed based on BCP, particularly non-variceal reported from developed countries [21,22]; similar data are not available from developing countries.

Pfau et al [20] did not demonstrate any improvement in the time to endoscopy; we achieved this success mainly by changing the practice of performing endoscopy within 24 h of admission. While some studies [22] have been able to demonstrate a reduction in total length of stay in hospital, others were unable to do so. Similarly, survival improvement has not been reported in any of the reports, except in one report which demonstrated a trend of improved survival.

### Conclusion

We found that BCP implementation in UGI bleeding management was useful if practiced over longer time period.

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