A prospective cohort study of patients presenting to the emergency department with upper gastrointestinal bleeding

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Abstract

Background: Upper gastrointestinal (UGI) bleeding is a common presentation to the Emergency Department (ED), and is associated with re-bleeding and significant mortality. Although several studies have described etiology and outcome of UGI bleeding, few have been done in the EDs. **Materials and Methods:** This prospective observational cohort study included all patients presenting with hematemesis or melena, between June 2016 and January 2017 to the ED. Demographic data, risk factors, endoscopy findings and prognosticating scores were noted. Patients were followed up through telephonic communication after 3 months to assess re-bleeding rate and mortality. **Results:** The study cohort included 210 patients with a male predominance (76.2%). The mean (SD) age was 51 (16.8) years. They presented with either hematemesis (33.8%), melena (28.6%), or both (37.6%). One third (35.7%) had variceal bleed, 21% had peptic ulcer disease (PUD), and 43.3%bled due to other etiology. UGI scopy was performed in 85.2% of patients with banding (25.1%) and sclerotherapy (14%) being the most frequently performed procedures. Endoscopic intervention was not required in 58.6%of patients. Packed red cells were transfused in 46.7% patients. The 48-h re-bleed rate among variceal bleeders was 5.3% and 11.4% among peptic ulcer bleeders. The 3-month re-bleeding rate was 42.9% and the 3-month mortality rate was 17.5% among the variceal bleeders and the same was 5.6% and 2.8%, respectively, among the peptic ulcer bleeders. The overall mortality was 12.4%. **Conclusions:** Variceal bleeding and PUD were the predominant causes of UGI bleeding. Overall, a quarter of our patients had a re-bleed within 3 months, with majority being variceal bleeds.

Keywords: Emergency department, mortality, peptic ulcer, rebleed, upper gastrointestinal bleeding, variceal

Introduction

Upper gastrointestinal (UGI) bleed is a very common medical emergency presenting to the Emergency department (ED). It may present as hematemesis or malena and often as a life-threatening emergency with rapid clinical deterioration unless intervened immediately. Variceal bleeds are a result of portal hypertension due to cirrhosis, portal vein obstruction, and schistosomiasis. Common causes of non-variceal bleed include peptic ulcer disease (PUD), Mallory–Weiss eosophageal tears, erosive gastritis or eosophagitis, Dieulafoy's lesions, gastric cancer, etc. The etiology varies from place to place and the outcome depends on the level of expertise of the ED team and the gastroenterology team.[1] Most studies on etiology and outcome have been done

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in the West and there exists a paucity of data from India.[2-4] Very few studies have been done on a cohort of patients with UGI bleed from the ED. Determining the risk of re-bleed is important in patients with UGI bleed, in order to establish optimal ways of management.[5] The aim of this study was to describe the profile and outcome of patients presenting with UGI bleeding to the ED and the strength of our study is a 3-month follow-up of patients after the initial presentation to assess the re-bleed rate and mortality rate.

Methodology

Design

This was a prospective cohort study done to describe the profile of patients presenting to the ED with UGI bleeding due to various etiologies.

Setting

This study was done in the adult ED of Christian Medical College Vellore, which is a large tertiary care hospital in South India with 2,700 inpatient beds. The adult ED has 49 beds with 75,000 admissions yearly.

Participants

We recruited all adult patients more than 18 years old presenting to the ED between July 2016 and January 2017 with hematemesis or melena or both. A convenient sample of patients presenting over the week days (Monday–Friday) between 8 AM and 8 PM were recruited. Demographic data, history and examination findings were noted after obtaining a written informed consent from the patient.

Variables

Details of treatment in the ED UGI endoscopy findings and procedures done were noted. Forrest classification was used to grade PUD, whereas Model for End-Stage Liver Disease (MELD) was used to characterize the severity of variceal bleed.

Outcome variables

After the ED resuscitation, patients were either admitted in the ward or discharged stable. Forty-eight-hour mortality and re-bleed rates were obtained by following up the patient within the hospital. Re-bleed was defined as any hematemesis or melena occurring after the initial presentation to the ED. The rate of re-bleed and mortality rates were assessed through a telephonic call made after 3 months.

Statistical analysis

A data sheet was made using Microsoft Excel version 16.0, after which Statistical Package for Social Sciences (SPSS Inc. Released 2015, version 23.0. Armonk, New York) was used to analyze the data collected. Categorical variables were described using frequencies and percentages, and continuous variables were divided into categories and subjected to the same exercise.

Ethical considerations

Patient confidentiality was maintained using identifiers, and a password-protected access to the data for a limited number of individuals was maintained to ensure protection of privacy. This study was approved by the Institutional Review Board (IRB Min No. 10116 dated 10/06/2016).

Results

During the 7-month study period, 210 patients presenting to the adult ED with UGI bleed were recruited. [Figure 1]. The mean age of the study cohort was 51 ± 16.8 years with a male preponderance (76.2%). Majority (79%) were triage priority two patients. The baseline characteristics including the co-morbidities and time of presentation to the ED are shown in Table 1.

The etiological profile of UGI bleeding seen in these patients was varied, the bulk of which were variceal bleeds (35.7%) and PUD-related bleeding (21%), followed by gastrointestinal malignancy (4.8%) and Mallory–Weiss tears (3.3%). Miscellaneous etiologies such as erosive gastritis, esophagitis, polyp, Dieulafoy lesion, corrosive injury, or unknown causes formed the remaining 35.2%.

The clinical presentation, examination findings, laboratory investigations and ED management is shown in Table 2. The most common mode of presentation was with both hematemesis and melena (37.6%), followed by only hematemesis (33.8%), and only melena (28.6%). Common risk factors included chronic alcohol consumption (43.3%), smoking (20%), Non-steroidal anti-inflammatory drug (NSAID) use (6.6%) and anti-platelet use (4.3%). The mean SOFA score was 3.37 (SD 2.10) among variceal bleeders, 1.25 (SD 1.7) among PUD bleeders, and 1.83 (SD 2.11) among others. The mean hemoglobin was lowest among the variceal bleeders 8.81 (SD 2.56). Almost half the patients (46.7%) required emergency blood product transfusion in the ED.

| Table 1: Baseline characteristics (*n*=210)		
Characteristic	Number	Percentage
Mean age (SD)	51 (SD: 16.8)	
Sex distribution		
Males	160	76.2
Females	50	25.8
Triage Priority level		
Priority 1	29	13.8
Priority 2	166	79
Priority 3	14	6.6
Time of presentation to the ED		
8 am - 5 pm	82	39
5 pm- 12 am	86	41
12 am - 8 am	42	30
Co-morbidities		
Diabetes Mellitus	66	31.4
Hypertension	65	31
Chronic liver disease	54	25.7
Chronic kidney disease	16	7.6
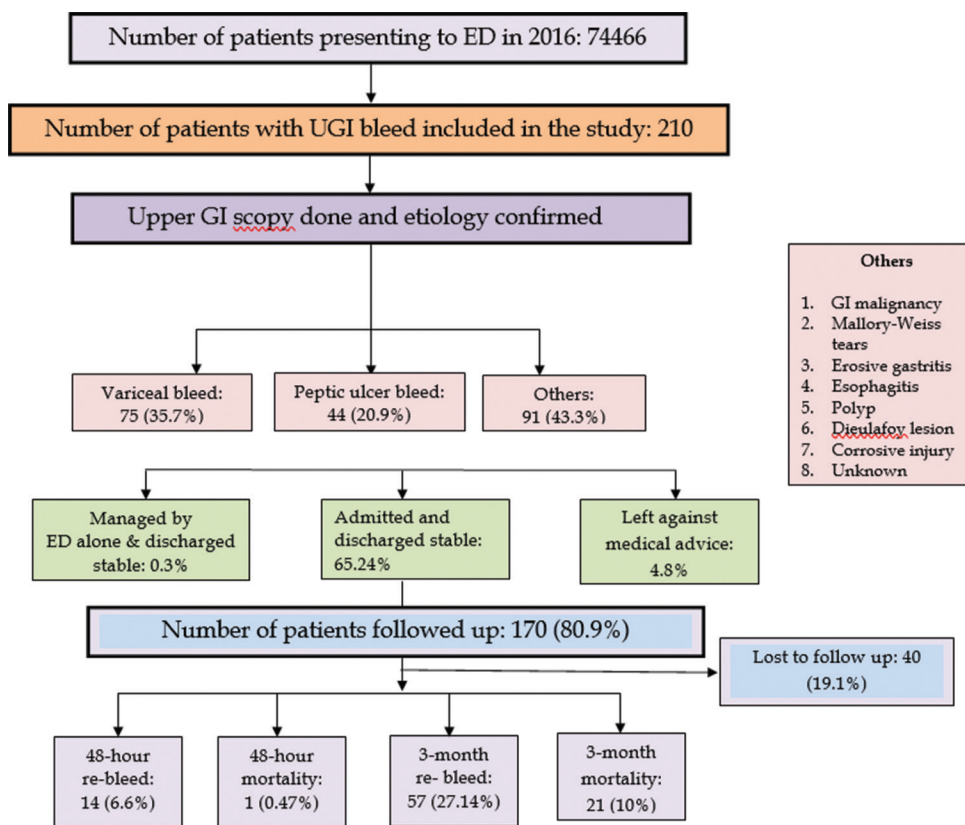
Figure 1: STROBE diagram

Table 2: Clinical presentation, examination findings, laboratory investigations and ED management (*n*=210)			
Characteristic	Variceal bleed (*n*=75)	Peptic ulcer (*n*=44)	Others (*n*=91)$^\$$
Clinical presentation			
Only Hematemesis	19 (25.3%)	12 (27.3%)	40 (43.9%)
Only Melena	23 (30.7%)	7 (15.9%)	30 (33%)
Both	33 (44%)	25 (56.8%)	21 (23.1%)
Addictions and medications			
Alcohol	48 (64%)	13 (29.5%)	30 (33%)
Smoking	17 (22.7%)	8 (18.2%)	17 (18.7%)
NSAIDs	3 (4%)	7 (15.9%)	4 (4.4%)
Anticoagulants	0 (0)	6 (13.6%)	9 (10%)
Antiplatelets	0 (0)	3 (6.8%)	6 (6.6%)
Examination findings			
SBP <90 mmHg	4 (5.3%)	6 (13.6%)	10 (10.99%)
HR >100/min	39 (52%)	21 (47.7%)	42 (46.1%)
SOFA score*	3.37 (2.10)	1.25 (1.7)	1.83 (2.11)
Laboratory investigations			
Hemoglobin*	8.81 (2.56)	9.30 (2.96)	10.62 (3.79)
Total bilirubin#	1.70 (1.20-4.15)	0.50 (0.30-0.80)	0.70 (0.40-0.90)
Albumin#	2.80 (2.45-3.30)	3.50 (3.00-3.86)	3.50 (2.75-4.10)
INR >1.1	63 (84%)	14 (31.82%)	26 (28.57%)
ED management			
Vasopressor use	4 (5.33%)	3 (6.82%)	7 (7.69%)
Packed blood cells	39 (52%)	24 (54.5%)	35 (38.5%)
Fresh frozen plasma	3 (4%)	2 (4.5%)	1 (1.1%)
Platelets	2 (2.7%)	2 (4.5%)	4 (4.4%)

*Mean (SD), #Median (Interquartile range 25-75), $^\$$Others include to gastrointestinal malignancy, Mallory-Weiss tear, erosive gastritis, esophagitis, polyp, Dieulafoy lesion, corrosive injury

Among the 179 people who underwent UGI scopy, 41.3% required endoscopic interventions, with the most frequent interventions being banding (25.1%) and sclerotherapy (14%). No intervention was required during UGI scopy in 58.6% of patients. [Table 3]

The prognosticating and severity scoring systems for variceal and PUD bleeds are shown in Table 4. Fifty-seven percent of the variceal bleeders had a MELD score of 10-19 (indicating a prognosis of 6% mortality). Four patients had both varices and an active peptic ulcer. Two-thirds (68.7%) were classified as Forrest Class III.

The ED and hospital outcomes are shown in Table 5. Thirty percent of patients were discharged stable from the ED after the necessary resuscitation and UGI scopy intervention if required. Two thirds (65.2%) required hospital admission with a mean duration of stay of 4.5 (SD: 3.6 days) There were no deaths in the ED. However, 10 patients (4.7%) with poor prognosis left against medical advice from the ED. The 48-h re-bleed rate was 5.3% among the variceal bleeders and 11.4% among peptic ulcer bleeders. 169 patients were followed up via telephonic conversation after a period of 3 months to assess the re-bleed and mortality rates, whereas 41 patients were lost to follow up. The 3-month re-bleeding and mortality rates were 42.9% and 17.5%, respectively, among the variceal bleeders, whereas it was 5.6% and 2.8%, respectively, among the PUD bleeders. The overall mortality was 12.4% (21/169).

Discussion

Our study is one of the few on UGI bleed that recruited patients from the ED of a large tertiary care hospital in India with

Table 3: UGI scopy interventions (179)

Procedure	Number	Percentage
Banding	45	25.1
Sclerotherapy	25	14
Balloon tamponade	4	2.2
Hemoclipping	7	3.9
Glue Injection	8	4.5
Other	1	0.6
No Treatment	105	58.6

Table 4: Prognosticating and severity scoring systems

Variceal bleeds (*n*=54)		
MELD Score	**Number**	**Percentage**
>40	0	0
30-39	1	1.8
20-29	12	22.2
10-19	31	57.4
1-9	10	18.5
Peptic ulcer disease (*n*=48)		
FORREST classification	**Number**	**Percentage**
I	0	0
Ia	1	2
Ib	2	4.2
II	0	0
IIa	4	8.3
IIb	2	3.1
IIc	6	12.5
III	33	68.7

follow-up period of 3 months. Our ED receives a significant number of patients with UGI bleeding probably because it is a large referral center with patients presenting to us from across the country.[6] Also, regional variation in disease profile and risk factors leading to UGI bleeding could have played a part. In Tamil Nadu, alcohol consumption is a prevalent practice, and alcohol-related liver disease is a major contributor to mortality. This could have led to the significant number of patients with CLD.

The age distribution among the other Indian studies were similar to ours, which was 51 ± 16.8 years. A study done in our own hospital in 2013 by Simon *et al.* had a mean age of 49.9 years.[5] Another study done South India by Rodrigues *et al.* found the mean age to be 48.5 years and a third study done in North India by Chandail *et al.* had a mean age of 49 years.[7,8]

A general trend in previous studies done in India was a larger proportion of male patients with UGI bleeding as compared to females. Our study showed a male to female ratio of 3.2, whereas another study done in Odisha by Singh *et al.* with a sample size of 608 patients showed a male to female ratio of 6:1.[9] Due to the larger sample size and consecutive nature of patient recruitment, this probably paints a more accurate picture of the patient profile. Meanwhile, the studies done by Lakhwani *et al.* showed a male to female ratio of 7.54, Kashyap *et al.* showed 3.63 and Rodrigues *et al.* showed 2.88.[2,7,10]

The risk factors seen for UGI bleeding in our study were several, with two-thirds being either alcohol consumers or smokers or both. Lakhwani *et al.*, determined risk factors of smoking (50.1%), alcohol consumption (37.5%), NSAID use (17.2%), indigenous remedy use (5.5%), anticoagulant use (2.3%) and steroid use (0.8%).[2] Singh *et al.*, found risk factors of alcohol consumption (30%) and NSAID ingestion (13%).[9]

In the study done by Chandail *et al.*, a statistically significant relationship was found between co-morbidities such as diabetes mellitus and coronary artery disease and a bad clinical outcome.[8] This study also found a higher mortality in patients with unstable vitals, unlike our own, where a systolic blood pressure of <90 mmHg and pulse rate of >100/minute did not reflect upon the mortality or outcome. This probably is because of the significant number of patients with bad prognosis who left the ED against medical advice.

The etiology of UGI bleed in our study (variceal: 35.7%, PUD: 21%, gastrointestinal malignancy: 4.8% and Mallory–Weiss tears: 3.3%) was comparable to the only other study done in the ED by Chandail *et al.* (variceal: 56.14%, PUD: 14.9%, gastrointestinal malignancy: 4.38% and Mallory–Weiss tears: 8.7%).[8] We also did not find any significant association between low hemoglobin value at presentation, taken as <7 g/dL, with the outcome. However, a study done in Thailand showed that low hemoglobin values were predictors of a severe UGI hemorrhage.[11] Similarly, we did not find any relationship between

Table 5: Hospital outcome, re-bleed rate and mortality			
Characteristic	Variceal bleed (*n*=75)	Peptic ulcer (*n*=44)	Others (*n*=91)$
Discharged stable from ED	8 (10.7%)	12 (27.3%)	43 (47.2%)
Admitted and discharged stable	65 (86.7%)	30 (68.2%)	42 (46.2%)
Left against medical advice from ED	2 (2.7%)	2 (4.5%)	6 (6.6%)
48 h re-bleed rate	4 (5.3%)	5 (11.4%)	5 (5.5%)
3 month re-bleed rate (*n*=171)	27/63 (42.9%)	2/36 (5.6%)	20/72 (27.8%)
48 h mortality	0	0	1 (1.1%)
3 month mortality (*n*=169)	11/63 (17.5%)	1/36 (2.8%)	9/70 (12.8%)

$Others include gastrointestinal malignancy, Mallory-Weiss tear, erosive gastritis, esophagitis, polyp, Dieulafoy lesion, corrosive injury

INR or serum creatinine and outcome. Chandail *et al.* showed that coagulopathy and higher creatinine values at presentation led to poorer outcome. (*P* = 0.001 for both).[8] The lack of association in our study could be due to better hemodynamic stabilization as reflected by adequate blood product administration to our patients. Almost half (46.7%) of our patients received packed red cells either in the ED or in the ward. In the previously mentioned study, a significant relationship was found between the number of blood transfusions and patient outcome.[8]

Two scoring systems were used in our study, namely MELD and Forrest scores. A majority of variceal bleeders had MELD scores of 10-19 and most PUD-related bleeders had a Forrest class of III. As most patients fell under a relatively stable category of these scoring systems, we suspect that a clear association could not be made. A study conducted by Bambha *et al.*, in a larger sample size showed an association between MELD score of more than or equal to 18 and the risk of re-bleed within 5 days.[11] Overall, nearly one third (28.65%) of our patients had a rebleed within 3 months, with majority being variceal bleeds. Majority of the mortality too was among those with variceal bleeds. These rates are consistent with other studies done in the past.[4,5,7,12-16]

Although we were not able to find associations between various aspects of presentation, patient stability and lab parameters, methods of intervention and their consequential outcomes, studies conducted throughout India showed otherwise, as was highlighted above. Despite these shortcomings, our study is unique in its nature of a combination of early and delayed follow-up methodology. We believe that a future study with similar pattern, taking into account a larger sample size and performed in a primary or secondary healthcare setting would give a better picture of prognosticating parameters.

Conclusions

Variceal bleeding and PUD were the predominant causes of UGI bleeding. Among the variceal bleeders, chronic alcohol consumption was found to be significantly associated with the risk of re-bleed. Overall, a quarter of our patients had a re-bleed within 3 months, with majority being variceal bleeds.

Research quality and ethics statement

The authors of this manuscript declare that this scientific work complies with reporting quality, formatting and reproducibility guidelines set forth by the EQUATOR Network. The authors also attest that this clinical investigation was determined to require Institutional Review Board/Ethics Committee review, and the corresponding protocol/approval number is IRB Min. No. 10116 dated 10.06.2016. We also certify that we have not plagiarized the contents in this submission and have done a Plagiarism Check.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. O'Byrne M, Smith-Windsor E, Kenyon C, Bhasin S, Jones J. Regional differences in outcomes of nonvariceal upper gastrointestinal bleeding in Saskatchewan. Can J Gastroenterol Hepatol 2014;28:135-9.

2. Lakhwani M, Ismail A, Barras C, Tan W. Upper gastrointestinal bleeding in Kuala Lumpur Hospital, Malaysia. Med J Malaysia 2000;55:498-505.

3. Telaku S, Kraja B, Qirjako G, Prifti S, Fejza H. Clinical outcomes of nonvariceal upper gastrointestinal bleeding in Kosova. Turk J Gastroenterol 2015;25:110-5.

4. Chalya P, Mabula J, Koy M, Mchembe M, Jaka H, Kabangila R, *et al.* Clinical profile and outcome of surgical treatment of perforated peptic ulcers in Northwestern Tanzania: A tertiary hospital experience. World J Emerg Surg 2011;6:31.

5. Simon E, Chacko A, Dutta A, Joseph A, George B. Acute nonvariceal upper gastrointestinal bleeding—Experience of a tertiary care center in southern India. Indian J Gastroenterol 2013;32:236-41.

6. Rufus YB, Abhilash KP, Swadeepa RJ, Koshy SA, Chandy GM. Clinical profile and outcome of the patients presenting to the resuscitation room of the emergency department in

a Tertiary Care Hospital of South India. Curr Med Issues 2019;17:25-9.

7. Rodrigues G, Shenoy R, Rao A. Profile of nonvariceal upper gastrointestinal: Bleeding in a tertiary referral hospital. Internet J Surg 2003;5. doi: 10.5580/1601.

8. Mahajan P, Chandail V. Etiological and endoscopic profile of middle aged and elderly patients with upper gastrointestinal bleeding in a Tertiary Care Hospital in North India: A retrospective analysis. J Midlife Health 2017;8:137-41.

9. Singh S, Panigrahi M. Spectrum of upper gastrointestinal hemorrhage in coastal Odisha. Trop Gastrol 2013;34:14-7.

10. Kashyap R, Mahajan S, Sharma B, Jaret P, Patial R, Rana S, *et al.* A Clinical profile of upper gastrointestinal bleeding at moderate altitude. J Indian Acad Clin Med 2005;6:224-8.

11. Bambha K, Kim W, Pedersen R, Bida J, Kremers W, Kamath P. Predictors of early re-bleeding and mortality after acute variceal haemorrhage in patients with cirrhosis. Gut 2008;57:814-20.

12. Maggio D, Barkun A, Martel M, Elouali S, Gralnek I; the REASON investigators. Predictors of early rebleeding after endoscopic therapy in patients with nonvariceal upper gastrointestinal bleeding secondary to high-risk lesions. Can J Gastroenterol 2013;27:454-8.

13. Sepanlou SG, Khademi H, Abdollahzadeh N, Noori F, Malekzadeh F, Malekzadeh R. Time trends of gastro-esophageal reflux disease (GERD) and peptic ulcer disease (PUD) in Iran. Middle East J Digest Dis 2010;2:78–83.

14. Chaikitamnuaychok R, Patumanond J. Clinical risk characteristics of upper gastrointestinal hemorrhage severity: A multivariable risk analysis. Gastroenterol Res 2012;5:149-55.

15. Pandey V, Patil M, Patel R, Chaubal A, Ingle M, Shukla A. Prevalence of splenic vein thrombosis and risk of gastrointestinal bleeding in chronic pancreatitis patients attending a tertiary hospital in western India. J Family Med Prim Care 2019;8:818-22.

16. Bhutia KD, Lamtha SC. Retrospective study of etiology of non variceal acute gastrointestinal bleeding in Eastern Himalayan region of india in Sikkim. J Family Med Prim Care 2019;8:573-5.