

A study of the risk factors and outcome in patients with upper gastrointestinal bleed presenting to a tertiary care center in Kumaon region of Uttarakhand



Alka¹, Subhash Chandra Joshi², Vivekanand Satyawali³, Yatendra Singh⁴, Arun Joshi⁵

¹Senior Resident, Department of General Medicine, Veer Chandra Singh Garhwali Government Institute of Medical Science and Research, ²Professor and Head, ³Associate Professor, ⁴Assistant Professor, ⁵Professor, Department of General Medicine, Dr. Susheela Tiwari Memorial Hospital and College, Haldwani, Uttarakhand, India

Submission: 12-11-2022

Revision: 03-05-2023

Publication: 01-06-2023

ABSTRACT

Background: Upper gastrointestinal (GI) bleeding refers to blood loss within the intraluminal GI tract from any location between the upper esophagi to the duodenum at the level of the ligament of Treitz. Bleeding from the upper GI tract may present as hematemesis, melena, hematochezia, occult GI bleeding, and anemia. **Aims and Objectives:** The aims of this study were to study the risk factors and outcome in upper GI bleed patients presenting to a tertiary care center in Kumaon region of Uttarakhand. The primary objective was to estimate the proportion of mortality in upper GI bleed patients attending a tertiary care center. The secondary objective was to study the risk factors associated with upper GI bleed and their effect on mortality. **Materials and Methods:** This was a hospital-based observational prospective clinical study, carried out in the Department of General medicine, Dr. Susheela Tiwari Memorial Hospital and associated Government Medical College, Haldwani, from January 2020 to September 2021 after obtaining ethical clearance from the Institutional Review Committee and informed consent from the patient or patient relatives. Statistical testing has been conducted with the Statistical Package for the Social Science software (SPSS version 20.0). **Results:** The factors associated with mortality using multivariate analysis were high international normalized ratio (INR), low albumin, raised serum glutamic oxaloacetic transaminas, high Child Pugh Score, and high model for end stage liver disease (MELD) score found to be significant. **Conclusion:** The mortality rate in our patients was 18% and factors associated with increased mortality were high INR, low Albumin, raised creatinine, high Child Pugh Score, high MELD score, and presence of spontaneous bacterial peritonitis.

Key words: Upper gastrointestinal tract; Anemia; International normalized ratio; Multivariate analysis

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a potentially fatal, time-critical presenting complaint in the emergency department (ED).^{1,2} The burden it presents can be compounded in resource poor settings, where patients often pay out-of-pocket for care, thereby hampering appropriate early intervention to determine the location

and severity of bleeding.³ The overall incidence of acute upper gastrointestinal (GI) hemorrhage has been estimated at 50–100/100,000 patients per year, with an annual hospitalization rate of approximately 100/100,000 hospital admissions.^{4,5} Bleeding from the upper GI tract may present as hematemesis, melena, hematochezia, occult GI bleeding, and anemia. The UGIB presents with a wide spectrum of clinical severity that ranges from insignificant bleeding to

Access this article online

Website:

<http://nepjol.info/index.php/AJMS>

DOI: 10.3126/ajms.v14i6.49329

E-ISSN: 2091-0576

P-ISSN: 2467-9100

Copyright (c) 2023 Asian Journal of Medical Sciences



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Address for Correspondence:

Dr. Subhash Chandra Joshi, Professor and Head, Department of General Medicine, Dr. Susheela Tiwari Memorial Hospital and College, Haldwani - 263 139, Uttarakhand, India. **Mobile:** +91-9837171075. **E-mail:** drsubhash8joshi@gmail.com

catastrophic exsanguinating hemorrhage.⁶ Approximately 80–85% of UGIB stop spontaneously without the need of specific therapy.^{7,8} In the remaining 15–20% of cases, bleeding continues or recurrent bleeding develops, and these patients have high morbidity and mortality.⁹ The etiology and outcome of upper GI bleeding varies significantly in different geographic regions depending on the demographic and socioeconomic characteristics of the local population.^{10,11} Patients with upper GI bleed can be divided into variceal and non variceal sources of bleed each have different protocols of management and prognosis.¹² The first and the most common cause is portal hypertension resulting in gastroesophageal varices and portal hypertensive gastropathy, second most common cause being peptic ulcer disease, and other causes include erosive gastritis, reflux esophagitis, Mallory Weiss tear, and malignancy.¹³ There is a dearth of health data depicting the clinical characteristics of the condition in Indian countries. To the best of our knowledge, few studies have looked into risk factors and outcome in patients with UGIB in India; hence, we set out to describe the risk factors and outcome in patients with upper GI bleed presenting to a tertiary care center in Kumaon Region of Uttarakhand. Such data on clinical profile of patients with UGI bleed helps in understanding epidemiological pattern, factors associated with mortality and to consider appropriate management tools in the hospital.

Aims and objectives

The aims of this study were to study the risk factors and outcome in upper GI bleed patients presenting to a tertiary care center in Kumaon region of Uttarakhand.

The primary objective was to estimate the proportion of mortality in upper GI bleed patients attending a tertiary care center. The secondary objective was to study the risk factors associated with upper GI bleed and their effect on mortality.

MATERIALS AND METHODS

This was a hospital-based observational prospective clinical study, carried out in the Department of General medicine, Dr. Susheela Tiwari Memorial Hospital and associated Government Medical College, Haldwani from January 2020 to September 2021. The study was pre-approved by the Institutional Ethics Committee for the final permission. All patients presenting with UGIB to the department of general medicine (outpatient department [OPD] and ED) in the study period duration.

All patients of UGIB who presented either in OPD or ED with UGIB were managed taking care of ABC

first, IV fluids and blood products given to those who were hemodynamically unstable or developed severe anemia, following our hospital policy of restricted blood transfusion (target 7–9 g/dl for those with variceal bleed and 9–11 g/dl for those having non-variceal bleed). COVID-19 testing was also done for the patients and they reported negative. Patients who were in shock were taken on vasopressor support with regular vital monitoring and titration done accordingly. Index endoscopy was done for all hemodynamically unstable patients within 12 h and those who were stable hemodynamically endoscopy were performed within 24 h of hospital admission. Further, management done as suggested by findings of endoscopy with variceal ligation, sclerotherapy, injection adrenaline, etc. Liver biopsy was not performed as the patients and their attendants were reluctant for the same and diagnosis of non-alcoholic fatty liver disease-related chronic lung disease was made on the basis of history and physical examination, liver imaging, and blood tests to exclude other liver diseases.

Patients were counseled on the objectives of the study, and written consent obtained. Structured interviews were conducted at first contact with those patients whose higher mental functions were intact else interviewed later once fully oriented, to collect information on demographic characteristics. All hepatitis positive patients were, further, enquired to determine social characteristics and mode of acquiring infection by serial questionnaire, family history, and history of childhood immunization for hepatitis B virus. Personal history, history of risk factors, and chronic hepatitis was obtained. The sociodemographic characteristics and data on possible risk factors were collected through an interview with participants using a structured questionnaire During the hospital stay and at discharge, the patients were explained in detail about the nature of their condition and counseled regarding further follow-up.

The data collection tool used was a pre-coded and pretested questionnaire which was also translated into the local dialect. All the details of the patient were followed until they were discharged/expired. The results were analyzed based on the master chart prepared in Microsoft Excel. Statistical testing has been conducted with the Statistical Package for the Social Sciences software (SPSS version 20.0). Continuous variables were presented as mean±SD. Categorical variables were expressed as frequencies and percentages. Being an observational study, simple statistical calculations were performed using mean and percentages. Difference between two groups was determined using student t-test as well as Chi-square test and the level of significance was set at P<0.05.

Selection criteria

Inclusion criteria

The following criteria were included in the study:

1. Patients aged >16 years presenting with upper GI bleed to the general medicine department
2. Patients willing to take part in the study.

Exclusion criteria

The following criteria were excluded from the study:

1. Patients <16 years of age
2. Patient/guardian refusing for consent
3. Patients presenting with upper GI bleed following GI surgery.

RESULTS

This observational, prospective, and hospital-based study was conducted among 64 patients aged >16 years presenting with UGIB admitted to Dr.Susheela Tiwari Hospital, General Medicine Department, Haldwani, Uttarakhand in 2020–2021, out of which 50 were enrolled in final study, as some patients did not participate in the study and some got discharged prematurely. Majority of the study participants (46%) were in the age group 45–60 years followed by 31–45 years (24%) and >16–30 years (14%). Female and male accounted for 32% and 68% of the subjects, respectively. Maximum subjects were from rural area (72%) as compared to urban area (28%). About 64% of the subjects were from lower and lower middle SES (According to Modified Kuppaswamy socioeconomic scale).¹⁴ Illiterate subjects were 44% while graduate subjects were 22%. Most common occupation was labor (26%), followed by businessman (22%) and housewife (22%) (Table 1).

Most common risk factor in variceal was alcohol (50%) followed by smoking (40%) while, in case of non-variceal, the same was NSAID (65%), followed by smoking (35%) and alcohol (30%). When risk factors were compared between variceal and non variceal, it was found to be statistically significant as $P < 0.05$ (Table 2).

Mortality was found in seven subjects with variceal cause and two subjects with non-variceal Cause of UGIB. When mortality was compared according to etiology, it was found to be statistically insignificant as $P > 0.05$ (Table 3).

Table 4 shows the factors associated with mortality using univariate analysis. Significant factors associated with mortality were high international normalized ratio (INR), low Albumin, raised serum glutamic oxaloacetic transaminase (SGOT), raised creatinine, high Child Pugh Score, high model for end-stage liver disease (MELD) score, and presence of spontaneous bacterial peritonitis.

Table 1: Demographic profile of the study subjects

Variable	Categories	Frequency	Percentage
Age group (in years)	16–30	7	14
	31–45	12	24
	45–60	23	46
	≥60	8	16
Gender	Female	16	32
	Male	34	68
Location	Urban	14	28
	Rural	36	72
SES	Lower	16	32
	Lower middle	16	32
	Upper	6	12
	Upper lower	2	4
	Upper middle	10	20
Education	Illiterate	22	44
	Up to 10 th	14	28
	Up to 12 th	3	6
	Graduate	11	22
Occupation	Farmer	7	14
	Laborer	13	26
	Businessman	11	22
	Housewife	11	22
	Engineer	2	4
	Student	5	10

Table 2: Risk factor according to variceal and non variceal

Risk factors	Non-variceal		Variceal		Total	
	n=20	%	n=30	%	n=50	%
Alcohol	6	30	15	50	21	42
Smoking	7	35	12	40	19	38
NSAID	13	65	2	6.67	15	30
Aspirin	1	5	2	6.67	3	6
Steroid	1	5	0	0.0	1	2
Hepatitis B	1	5	4	13.33	5	10
Hepatitis C	1	5	5	16.67	6	12
Chi-square			11.62			
P-value			0.0039*			

Table 3: Mortality according to etiology

Outcome	Variceal		Non-variceal		P-value
	N	%	n	%	
Death	7	23.33	2	10	0.229
Survived	23	76.66	18	90	
Total	30	100	20	100	

Table 5 shows the factors associated with mortality using multivariate analysis. Significant factors associated with mortality were high INR, low Albumin, raised SGOT, high Child Pugh Score, and high MELD Score.

DISCUSSION

There has been a global decline in the mortality associated with UGIB, the incidence, and mortality associated with GI bleeding remains high in limited income countries. This

Table 4: Univariate analysis according to various parameters w.r.t. mortality

Variables	Death	Survived	P-value
Age	47.50±17.68	47.56±14.29	0.96
INR	2.55±0.21	1.54±0.38	0.031*
Protein	4.90±0.99	6.52±0.92	0.25
Albumin	1.50±0	3.22±0.82	<0.01*
Total bilirubin	4.75±5.16	1.69±1.81	0.56
Direct bilirubin	3.95±4.59	0.95±1.57	0.53
ALP	154±73.37	97.13±85.99	0.48
SGOT	127.50±7.78	73.90±119.15	0.005*
SGPT	33.50±17.68	41.60±42.08	0.63
Creatinine	1.90±0.14	1.35±1.72	0.049*
Child pugh score	12±1.41	5.29±4.82	0.026*
MELD score	27.50±4.94	10.56±10.14	0.024*
Forrest class			
2A	0	1	0.97
2B	0	2	
2C	0	1	
3	0	5	
Blood transfusion	1	11	0.39
Ascites	1	18	0.71
Spontaneous bacterial peritonitis	1	1	<0.01*
HE	1	4	0.12

MELD: Model for end stage liver disease, SGPT: Serum glutamic pyruvic transaminase, SGOT: Serum glutamic oxaloacetic transaminase, INR: International normalised ratio

Table 5: Multivariate analysis of outcome according to various parameters

Parameters	OR	P-value
Albumin	6.99	0.01*
Creatinine	2.57	0.062
INR	2.71	0.054
Spontaneous bacterial peritonitis	2.69	0.071
Child pugh score	4.11	0.003*
MELD score	3.56	0.007*
SGOT	2.88	0.026*

INR: International normalized ratio, MELD: Model for end stage liver disease, SGOT: Serum glutamic oxaloacetic transaminase

observational, prospective, and hospital-based study was conducted among 64 patients aged >16 years with UGIB admitted to Dr. Susheela Tiwari Hospital, General Medicine Department, Haldwani, Uttarakhand in 2020–2021, out of which total 50 were enrolled in the final study as some patients did not participate in the study and some got discharged prematurely.

Majority of the study participants (46%) were in the age group 45–60 years followed by 31–45 years (24%) and >16–30 years (14%) in this study. Similar results were noted in a study by Kashyap et al.,¹⁵ from a tertiary care center in Shimla, with maximum patients (47.7%) with UGIB were in the age group of 41–60 years.

Similarly, study by Limboo et al.,¹⁶ from a tertiary care center in Sikkim reported maximum patient with age group of 51–60 years and with mean age of 53.70 years. Similarly Kamat et al.,¹⁷ in Jawaharlal Nehru Medical College, Belgaum revealed that nearly one-fourth, that is, 24% of the patients each presented with age between 40 and 50 years and 61–70 years. Hence, the findings of our study were almost similar to other studies done previously in different regions of India. Female and male accounted for 32% and 68% of the subjects, respectively. Hence, there was male dominancy in our study.

The UGI bleeding is categorized as variceal and non-variceal bleeding. In this study, causes of upper GI was variceal, found in 30 (60%) and non-variceal, revealed in 20 (40%) subjects, respectively. In variceal cases, most common cause was esophageal varices (44%), while, in non-variceal, most common cause was gastric as well as Malory-Weiss tear followed by duodenal ulcer. The etiology of UGI bleed in our study was comparable to the other study done in the ED by Chandail et al., from tertiary care center in Govt. Medical College, Jammu (variceal: 56.14%, PUD: 14.9%, GI malignancy: 4.38%, and Mallory–Weiss tears (8.7%).¹⁸ Bhandary et al.,¹⁹ in their study done in A.J. Institute of Medical Sciences (tertiary care center in Southern Karnataka) showed that most common lesion in upper GI bleed was esophageal varices (44.88%). Mallory Weiss tear was seen in 6.34% of the subjects. Lakhwani et al., in Kuala Lumpur hospital, Malaysia, in 2010, reported duodenal ulcer (32%) as the most common causes of UGI followed by gastric ulcer (29.7%), erosion (10.9%), and oesophageal varices (10.9%).²⁰

In our study, mortality was reported in 18% of the study subjects. Mortality was found in only seven subjects with variceal cause and two with non-variceal cause of UGIB. When mortality was compared according to etiology, it was found to be statistically insignificant as $p > 0.05$. According to univariate analysis; significant factors associated with mortality were high INR, low Albumin, high SGOT, raised Creatinine, high Child Pugh Score, high MELD Score, and presence of Spontaneous bacterial peritonitis. However, according to multivariate analysis, significant factors associated with mortality were high INR, low albumin, high Child Pugh Score, and high MELD Score. In a study by Anand et al.,²¹ in 2014, at a tertiary care center of North India, overall mortality was seen in 21.05% of cases; however, majority of deaths was seen in portal hypertension related bleeding.

Another study conducted in 2016 by Baradaran et al.,²² in northern Iran concluded mortality rate of 23.2% among UGIB patients. Rockall et al.,⁶ in 1995, found that the overall mortality was 14%. In the emergency admissions,

65% of deaths in those aged under 80 were associated with malignancy or organ failure at presentation. Mortality for patients under 60 in the absence of malignancy or organ failure at presentation was 0.80%. It was also shown by a study done in Amsterdam by Vreeburg et al., that the mortality rate was 13.9%, in which most of them were related to advanced age, shock, and coexisting illnesses.⁷

Mortality was lower in our study as compared to similar other studies done previously because this study was done during COVID-19 pandemic, and our hospital was a dedicated COVID care center, so the number of study participants were less, and also, very sick patients were referred to AIIMS Rishikesh, Uttarakhand. Therefore, the discrepancy in mortality observed in our study.

A study by Rodrigues and Shenoy et al., from a tertiary care center in Kasturba Medical College Hospital, Manipal in their study did not find any relationship between INR or serum creatinine and outcome.

In our study, blood transfusion was required in 24% of the subjects, while only one subject underwent dialysis. Endoscopic intervention, namely, EVL, IJN Adrenaline, Sclerotherapy was done in 58%, 34%, and 8% of the subjects, respectively.

Limitations of the study

This study was conducted during covid 19 pandemic and our hospital was a dedicated covid care centre so the no of study subjects are less because only referred cases were coming to our hospital and hence the results may vary compared to similar studies done previously elsewhere.

We believe that a future study with similar pattern,taking into account a larger sample size would give a better picture of prognosticating parameters and outcome.

CONCLUSION

Variceal bleeding was the predominant cause of UGI bleeding.Mortality rate in our patients was 18% and factors associated with increased mortality were high INR,low albumin,raised creatinine,high Child Pugh Score,high MELD Score and presence of Spontaneous bacterial peritonitis.

ACKNOWLEDGMENT

I would like to express my gratitude to my teachers,colleagues,family members and all my patients who accepted to be a part of this study.

REFERENCES

- Jutabha R, Jensen DM. Acute upper gastrointestinal bleeding. In: Friedman SL, McQuaid KR, Grendell JH, editors. *Current Diagnosis and Treatment in Gastroenterology*. 2nd ed. New York: McGraw-HillCo; 2003. p. 53-69.
- Kumar A, Kasturi U, Singh A and Kaur D. Endoscopic profile and clinical outcome of patients presenting with upper gastrointestinal bleeding. *Int J Adv Med*. 2020;7(9):1355-1360. <https://doi.org/10.18203/2349-3933.ijam20203598>
- Rukewe A, Otegbayo JA and Fatiregun A. Clinical characteristics and outcome of patients with upper gastrointestinal bleeding at the emergency department of a tertiary hospital in Nigeria. *Ann Ib Postgrad Med*. 2015;13(2):89-93.
- Rockall TA, Logen RF, Devlin HB and Northfield TC. Incidence of and mortality from acute gastrointestinal hemorrhage in the United Kingdom. Steering committee and members of national audit of acute upper gastrointestinal hemorrhage. *BMJ*. 1995;311(6999):222-226. <https://doi.org/10.1136/bmj.311.6999.222>
- Vreeburg EM, Snel P, De Buijine JW, Bartelsman JF, Rauws EA and Tytgat GN. Acute upper gastrointestinal bleeding in the Amsterdam area: Incidence, diagnosis, and clinical outcome. *Am J Gastroenterol*. 1997;92(2):236-243. [https://doi.org/10.1016/s0016-5107\(96\)80131-3](https://doi.org/10.1016/s0016-5107(96)80131-3)
- Rockall TA, Logan, RF, Devlin HB and Northfield TC. Selection of patients for early discharge or outpatient care after acute upper gastrointestinal haemorrhage. National audit of acute upper gastrointestinal haemorrhage. *Lancet*. 1996;347(9009):1138-1140. [https://doi.org/10.1016/s0140-6736\(96\)90607-8](https://doi.org/10.1016/s0140-6736(96)90607-8)
- Sarin N, Monga N and Adams PC. Time to endoscopy and outcomes in upper gastrointestinal bleeding. *Can J Gastroenterol*. 2009;23(7):489-493. <https://doi.org/10.1155/2009/604639>
- Rivkin K and Lyakhovetskiy A. Treatment of nonvariceal upper gastrointestinal bleeding. *Am J Health Syst Pharm*. 2005;62(11):1159-1170. <https://doi.org/10.1093/ajhp/62.11.1159>
- Kankaria AG and Fleischer DE. The critical care management of nonvariceal upper gastrointestinal bleeding. *Crit Care Clin*. 1995;11(2):347-368. [https://doi.org/10.1016/s0749-0704\(18\)30071-x](https://doi.org/10.1016/s0749-0704(18)30071-x)
- Theocharis GJ, Thomopoulos KC, Sakellaropoulos G, Katsakoulis E and Nikolopoulo V. Changing trends in the epidemiology and clinical outcome of acute upper gastrointestinal bleeding in a defined geographical area in Greece. *J Clin Gastroenterol*. 2008;42(2):128-133. <https://doi.org/10.1097/01.mcg.0000248004.73075.ad>
- Chaudhary S, Shakya S, Jaiswal NK, Shahi A, Dhakal PR and Chaudhary N. Clinical profile and outcome of patients presenting with acute upper GI bleeding in a tertiary care Centre of Western Nepal. *J Univ Coll Med Sci*. 2018;6(1):3-7. <https://doi.org/10.3126/jucms.v6i1.21656>
- Ginn JL and Ducharme J. Recurrent bleeding in acute upper gastrointestinal hemorrhage: Transfusion confusion. *CJEM*. 2001;3(3):193-198. <https://doi.org/10.1017/s1481803500005534>
- Saleem SM. Modified Kuppuswamy socioeconomic scale updated for the year 2019. *Indian J Forensic Community Med*. 2019;6(1):1-3. <https://doi.org/10.18231/2394-6776.2019.0001>
- Kashyap R, Mahajan S, Sharma B, Jaret P, Patial RK, Rana S,

- et al. A clinical profile of acute upper gastrointestinal bleeding at moderate altitude. *JACM*. 2005;6(3):224-228.
16. Limboo LB, Dhakal M and Dhakal OP. Clinical presentation, etiology and outcome of upper gastrointestinal bleed from a tertiary care hospital of East Sikkim: An observational study. *J Evol Med Dent Sci*. 2013;2(20):3568-3577.
<https://doi.org/10.14260/jemds/728>
 17. Kamat AG and Hesarur V. Clinical and laboratory profile of sputum positive pulmonary tuberculosis among HIV seropositive and HIV seronegative patients-a cross-sectional study. *J Evid Based Med Healthc*. 2017;4(41):2461-2467.
<https://doi.org/10.18410/jebmh/2017/486>
 18. Chandail VS, Kotwal SK, Koul S, Gupta R and Mahajan A. Non-invasive markers for prediction of varices in patients with portal hypertension. *Int J Res Med Sci*. 2017;5(3):1007-1010.
<https://doi.org/10.18203/2320-6012.ijrms20170652>
 19. Bhandary NM and Samaga S. An abstruse case of refractory hypokalemia-a cabalistic diagnosis. *J Adv Med Dent Sci Res*. 2021;9(2):75-78.
 20. Lakhwani MN, Ismail AR, Barras CD and Tan WJ. Upper gastrointestinal bleeding in a Kuala Lumpur hospital, Malaysia. *Med J Malaysia*. 2000;55(4):498-505.
 21. Anand D, Gupta R, Dhar M and Ahuja V. Clinical and endoscopic profile of patients with upper gastrointestinal bleeding at tertiary care center of North India. *J Dig Endosc*. 2014;5(4):139-143.
 22. Baradaran F, Norouzi A, Tavassoli S, Baradaran A and Roshandel G. Factors associated with outcome in patients with acute upper gastrointestinal bleeding in a tertiary referral center in Northern Iran. *Middle East J Dig Dis*. 2016;8(3):201-205.
<https://doi.org/10.15171/mejdd.2016.32>

Authors' Contributions:

A- Concept and design of the study, prepared first draft of manuscript; **SCJ-** Statistical analysis and interpretation, reviewed the literature and manuscript preparation; **VS,YS,AJ-** Interpreted the results, preparation of manuscript and revision of the manuscript.

Work attributed to:

Dr. Susheela Tiwari Memorial Hospital and College, Haldwani - 263 139, Uttarakhand, India.

Orcid ID:

Dr. Alka- <https://orcid.org/0000-0002-6393-8114>

Dr. Vivekanand Satyawali - <https://orcid.org/0000-0001-9946-8460>

Dr. Subhash Chandra Joshi- <https://orcid.org/0000-0002-8856-0664>

Source of Funding: None, **Conflicts of Interest:** None.