

CLINICAL STUDY

Upper gastrointestinal system hemorrhage in the emergency department

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Abstract: *Objective:* In the present study, we aimed to investigate demographic and clinical characteristics of the cases presented to the Emergency Department with an acute upper gastrointestinal system hemorrhage, and to identify the initial evaluation and treatments along with explaining possible causes of hemorrhage.

Materials and methods: This prospective study was conducted between October 1, 2006 and September 30, 2007. Characteristics of the patients were evaluated in terms of age, gender, presenting symptoms, medical history, risk factors, coexisting symptom and diseases, results of the rectal examination and nasogastric evaluation, endoscopy findings, received treatments, duration of Emergency Department stay, admitting departments, and outcomes.

Results: 128 patients who presented to the Emergency Department during the study period were included in the study. As 27.3 % of the patients were female, 72.7 % were male. The mean age was 59.3 (± 16). 51.6 % of patients had a history of NSAID and aspirin use. Endoscopy was performed in 111 (86.7 %) patients. The most common finding among endoscopy results was gastric ulcer with a rate of 20.4 % followed by duodenal ulcer in 18.3 %. The mean hospitalization period in the Emergency Department was found to be 18 hours.

Conclusion: In conclusion, acute upper gastrointestinal hemorrhages are first evaluated and treated in Emergency Departments. Endoscopy was carried out on most of the patients during the monitoring in the Emergency Department. NSAIDs and aspirin are still the most important risk factors and peptic ulcer is the most frequently encountered underlying cause (Tab. 4, Fig. 1, Ref. 27). Full Text in free PDF www.bmj.sk.

Key words: upper gastrointestinal hemorrhage, emergency department, endoscopy.

Upper gastrointestinal system hemorrhage is a life-threatening and commonly encountered condition, which requires an immediate approach and careful monitoring (1). The incidence of acute gastrointestinal system hemorrhage (AUGIH) is reported to vary between 100–150/100.000 (1–7). Despite recent developments in diagnosis and treatment methods, upper gastrointestinal system hemorrhages are still associated with high mortality rates (8).

There are only a few studies focused on epidemiology of patients with acute upper gastrointestinal system hemorrhage who were treated in the Emergency Department. Most of the studies on gastrointestinal system hemorrhages have been performed in the Gastroenterology Department (8). However, the acute upper gastrointestinal hemorrhage cases first present to Emergency Department. Therefore, initial evaluations and treatments are carried out in the Emergency Department.

In the present study, we aimed to investigate demographic and clinical characteristics of the cases presented to the Emer-

gency Department with acute upper gastrointestinal system hemorrhage, and to identify the initial evaluation and treatments along with explaining possible causes of hemorrhage.

Materials and methods

The current prospective study was conducted in the Erciyes University, Medical School, Emergency Department between October 1, 2006 and September 30, 2007. Patients above 16 years of age presenting with acute upper gastrointestinal system hemorrhage were enrolled in the study. Lower gastrointestinal system hemorrhages were excluded from the study. Characteristics of the patients were evaluated in terms of age, gender, presenting symptoms, medical history, risk factors, coexisting symptom and diseases, results of the rectal examination and nasogastric evaluation, endoscopy findings, received treatments, duration of Emergency Department stay, admitting departments, and outcomes. The data obtained in the study were evaluated by the SPSS 11.5 program.

Results

One hundred and twenty-eight patients, who presented to the Emergency Department with AUGIH complaint within the study period, were enrolled in the study. As 27.3 % of the patients

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Tab. 1. Demographic features of the cases.

Sex	n	%
Female	35	27,3
Male	93	72,7
Age		
Mean±SD	59±16,1	
Range	(min19-max85)	
History of patients	n	%
Peptic ulcer	56	43,8
Erosive gastritis	18	14,1
Esophageal varices	10	7,8
Malignity	7	5,5
Hemorrhoid	2	1,6
Anal fissure	1	0,8
Drugs use in patients	n	%
NSAID and aspirin	66	51,6
Antiaggregants	15	11,7
Glucocorticoids	2	1,6
Habits	n	%
Alcohol	19	14,8
Cigarette	65	50,8
Symptoms	n	%
Hematemesis	73	57
Melena	102	79,7

Tab. 2. Examination with nasogastric catheter and rectal examination of the patients.

Rectal examination	n	%
Melena	107	83,6
Normal stool	10	7,8
Hematochezia	6	4,7
Empty rectum	5	3,9
Examination with nasogastric catheter	n	%
Normal gastric content	67	52,3
Hematemesis	32	25
Active hemorrhage	20	15,6
Nasogastric catheter was not applied	9	7

were female, 72.7 % were male. The mean age was 59.3 (±16) (Tab. 1). While hemorrhage was determined for the first time in 84 (65.6 %) of cases, 44 (34.4 %) had a history of previous hemorrhage. 45 (35.2 %) of the patients with a history of previous hemorrhage had used gastroprotective drugs, whereas 3 (2.3 %) had received sclerotherapy, 2 (1.6 %) ligation, 3 (2.3 %) both sclerotherapy and ligation, and 8 (6.3 %) previous operations. The medical history of the patients revealed gastric, duodenal, and stromal ulcers in 56 (43.8 %), erosive gastritis in 18 (14.1 %),

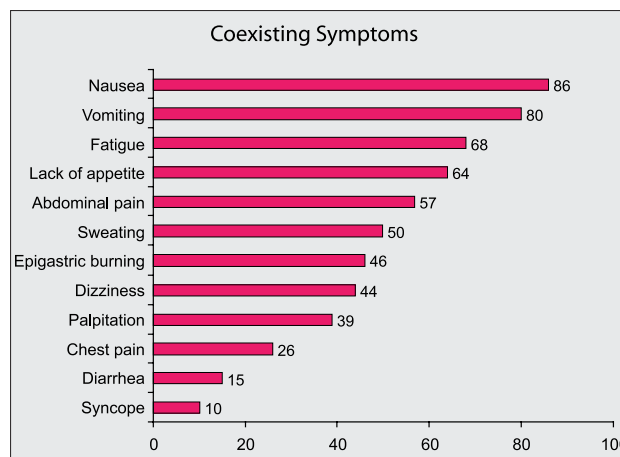


Fig. 1. Coexisting Symptoms.

esophageal varices in 10 (7.8 %), malignity in 7 (5.5 %), hemorrhoid in 2 (1.6 %) patients, and anal fissure in 1 (0.8 %) case. As 66 (51.6 %) of patients had a history of NSAID and aspirin use, 15 (11.7 %) and 2 (1.6 %) had a history of antiaggregant and glucocorticoid use, respectively. Alcohol history was present among 19 (14.8) patients and cigarette history was present among 65 (50.8) patients (Tab. 1). Twenty (15.6 %) of the cases mentioned the presence of chronic anemia. While 73 (57.0 %) cases described hematemesis, 102 (79.7) cases described melena. 61 (47.7 %) of those patients presented to the Emergency Department with both hematemesis and melena. Coexisting symptoms and complaints are shown in Figure 1. The most common coexisting disease was cardiac and coronary artery diseases showing up in 35 patients (27.3 %), followed by high blood pressure in 31 (24.2 %), liver diseases in 15 (11.7), chronic obstructive pulmonary disease (COPD) in 4 (3.1), chronic renal failure (CRF) in 4 (3.1 %), and extra-gastrointestinal malignancy in 5 (3.9 %) patients.

While 67 (52.3 %) patients were found to be normal after the examination with nasogastric catheter, 20 (15.6 %) patients demonstrated active hemorrhage, and 32 (25 %) displayed hematemesis. Nasogastric catheter was not applied in 9 (7 %) patients (Tab. 2).

Rectal examination of the patients showed melena in 107 (83.6 %) and hematochezia in 6 (4.7 %) cases (Tab. 2). Hypotension was found in 23 (76.6 %) and tachycardia was found in 35 (27.3 %) patients.

The number of patients with a hematocrit value below 30 was 68 (53.1 %). Prothrombin time was determined to be between 30–60 secs in 47 (36.7 %) patients (Tab. 3).

Endoscopy was performed on 111 (86.7 %) patients during monitoring in the Emergency Department. Endoscopy was not applied in 17 (13.3 %) patients in total because 4 didn't give consent, 7 were discharged by their own request, and 6 were immediately admitted to the ICU. The most common finding among endoscopy results was gastric ulcer with a rate of 20.4 % followed by duodenal ulcer in 18.3 %. Other results are outlined in Table 4.

Tab. 3. Laboratory findings of cases.

Hematocrit	n	%
<20%	14	10,9
20–29%	54	42,2
30–39%	51	39,8
≥40%	9	7
Prothrombine time	n	%
<30	80	62,5
30–60	47	36,7
≥60	1	0,8
BUN/creatinine ratio	n	%
<20	22	17,2
20–29	39	30,5
30–39	21	21,1
≥40	40	31,3

Tab. 4. Endoscopy findings of patients.

Gastric ulcer	29	20,4
Duodenal ulcer	26	18,3
Esophageal varices	17	12
Non-erosive gastritis	14	9,9
Erosive gastritis	13	9,2
Esophagitis and Esophageal ulcer	11	7,7
Malignity	8	5,6
Angiodysplasia	3	2,1
Atrophic gastritis	2	1,4
No pathologic finding	2	1,4
Endoscopy was not applied	17	12

In the Emergency Department, 100 (78.1 %) patients received blood and blood products, whereas 126 (98.4 %) received omeprazole, 70 (54.7 %) received antiemetic, and 17 (13.3 %) received somatostatin. Four (3.1 %) patients were immediately operated on. During endoscopy, 15 (11.7 %) patients received sclerotherapy and 14 (10.9 %) patients received band ligation.

The mean hospitalization period in the Emergency Department was found to be 18 hours (Std 23, min3–max144). As 72 (56.3 %) patients were admitted to the Gastroenterology Department, 24 (18.8 %) were admitted to the ICU, 18 (14.1 %) were discharged from the Emergency Department following their monitoring and treatment in the same Department. Seven (5.5 %) patients left the Emergency Department on their own will, 3 (2.3 %) were transferred to another in-patient healthcare center, and another 3 (2.3 %) patients were hospitalized in other departments. One patient died in the Emergency Department.

Discussion

AUGIH is one of the most common emergency conditions associated with digestive system, and it exhibits significant morbidity and mortality rates (9, 10). The incidence of AUGIH has been reported to be 60–70 % higher among males (3, 10, 11). In

the current study, parallel with the literature, 73 % of our patients were male.

In the present study, 34 % of patients presented to the Emergency Department due to gastrointestinal system hemorrhage, had a history of previous bleeding. Fiore et al. reported the rate of patients with a previous AUGIH as 19–23 % (10). Recent studies reported a decreasing trend in this number (1, 3, 10). Thomopoulos et al. conducted a study and found the same rate as 33 % between 1986–1987, while finding it as 6 % between 2000 and 2001 (3). Compared to those studies, the rate found in our study was observed to be high.

Many studies have shown a relationship between NSAID and aspirin use, and AUGIH (8, 12–16). NSAID and aspirin demonstrate an increase in use. Parallel to the increase of NSAID use against advancing age and coexisting diseases, hemorrhage complications exhibit a rise, as well (1). Fiore et al. reported the rate of aspirin use in 1996 and 2000 as 27 % and 33 %, respectively (10). Recent studies demonstrate those rates to be around 40–65 % (1, 3). In the current study, the rate of NSAID and aspirin use was 52 %.

As well as drug use, alcohol and smoking habits have an important place among risk factors of AUGIH (17, 18). Fiore et al. found alcohol habit in 70 % of cases having AUGIH (10). In the present study, the rates of alcohol and smoking were 15 % and 51 %, respectively.

In the study of Cohen et al, while 73 % of patients described melena, 32 % described hematemesis symptom with accompanying vomiting–stomach ache, and nausea (19). In the current study, 57 % described hematemesis and 80 % described melena. Nausea, vomiting, and fatigue were the most common coexisting symptoms.

Chassaignon et al determined hematemesis in 39 %, melena + hematemesis in 28 %, and solely melena in 25 % of their cases (8). Theocaris et al found the rate of hematemesis in both periods of their study as 22 % and 28 %, respectively (1). In the present study, the rates of hematemesis and melena were 40 % and 84 %, respectively. Only 93 % of our cases were subjected to nasogastric catheter. There were patients with varices among them. There is no study that indicated an aggravation of the hemorrhage due to nasogastric catheter placement in cases with AUGIH associated with varices (8).

The most common underlying cause of AUGIH is peptic ulcer (9, 10, 20, 21). Studies have shown that peptic ulcers were the underlying reason in 45–60 % of patients across the world who presented with AUGIH (1, 3, 8, 10). In more than 90 % of cases with AUGIH, hemorrhagic focus could be determined by endoscopy (19). Chassaignon et al performed endoscopy in 88 % of their patients in their study and determined varices in 37 %, ulcer in 34 %, and hemorrhage due to gastritis in 21 % among their 160 patients subjected to endoscopy (8). Theocharis et al conducted a study in 2005 and found gastric ulcer in 31.8 %, duodenal ulcer in 32.8 %, variceal hemorrhage in 6.1 %, malignity in 8 %, and gastroduodenitis in 9.1 % of their cases (1). Van Leerdam et al. performed endoscopy in 80 % of their patients in 2000 (22). They determined peptic ulcer in 46 % of the cases,

while gastroduodenal lesion in 20 % and varices in 7 %. In the present study, we applied endoscopy to 87 % of our patients, and parallel with the literature, 30 % of the patients demonstrated peptic ulcer as the most common underlying cause of the hemorrhages, followed by gastritis in 19 % and esophageal varices in 12 %.

The rate for requirement of general surgery in AUGIH varies between 2.8–30 % (20). As a result of the dramatic reduction in surgical indications of AUGIH, the rate of admittance to the Department of Surgery has decreased below 10 % (23, 24). Thomopoulos et al. conducted a study and found the rate of cases admitted to the Department of Surgery in 2000 as 5.2 % (3). In the current study, only 4 patients were admitted to the General Surgery and operated on. Recently, the number of patients referred to the Department of Surgery in our hospital has been reduced due to the developments in endoscopy in emergency settings.

An early medical treatment, particularly practice of pharmacological therapy in patients with cirrhosis, helps to control the hemorrhage and increases the survival rates (25). Using sclerotherapy in combination with somatostatin has been reported to be more efficient than single application of sclerotherapy (2, 26). In the present study, we used somatostatin in 17 patients with hemorrhages associated with esophageal varices. Intravenous omeprazole therapy reduces the risk of hemorrhage recurrence among patients that were subjected to endoscopic treatment (9). We started omeprazole treatment in 98 % of our cases in the Emergency Department.

Recently, especially the elevated incidence of ischemic heart disease and the consequent usage of certain drugs have increased the frequency of AUGIH (3). Studies have shown that 26 % of patients with AUGIH demonstrated ischemic heart disease (3). In the current study, this rate was found to be 27 %. In one study, while 22 % of patients were hospitalized in the ICU, 29 % were admitted to Gastroenterology Department, 27 % were admitted to Emergency Department, and 4 % were referred to the Department of Surgery (8). In the present study, 56 % of the patients were admitted to the Gastroenterology Department and 19 % were admitted to the ICU while 14 % were monitored and treated in the Emergency Department. The number of patients referred to the General Surgery was four. Studies across the world reported various mortality rates associated with AUGIH (3). Previous studies reported a mortality rate of 10–15 % (3, 6, 7, 22, 27). Rockall et al performed a study in 74 hospitals across England and reported mortality rates varied between 0 % and 29 % (24). Thomopoulos et al. reported a mortality rate of 3–5 % while finding low mortality rates in patients below 60 years of age who had no coexisting disease (3). In the present study, only one case of mortality was determined due to admittance of patient with serious condition to the ICU within a short period of time.

In the current study, the mean hospitalization period in the Emergency Department was found to be 18 hours. This shows the important role of Emergency Department in monitoring and treatment of AUGIH.

In conclusion, AUGIH is first evaluated and treated in Emergency Department. Most of the patients receive endoscopy during the monitoring in the Emergency Department. NSAIDs and aspirin continue to be the most important risk factors. Peptic ulcer is the most frequently encountered underlying cause. Endoscopic treatments have reduced the number of patients referred to the Department of Surgery.

References

1. **Theocharis GJ, Thomopoulos KC, Sakellaropoulos G, Katsakoulis E, Nikolopoulou 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: 128–133.
2. **Overton DT.** Gastrointestinal bleeding. In: Tintinalli JE, Kelen GD, Stapczynski JS, editors. *Emergency medicine: a comprehensive study guide*. New York: Mc Graw Hill Company; 2004, 505–508.
3. **Thomopoulos KC, Vagenas KA, Vagianos CE et al.** Changes in aetiology and clinical outcome of acute upper gastrointestinal bleeding during the last 15 years. *Eur J Gastroenterol Hepatol* 2004; 16: 177–182.
4. **Witting MD, Magder L, Heins AE, Mattu A, Granja CA, Baumgarten M.** ED predictors of upper gastrointestinal tract bleeding in patients without hematemesis. *Am J Emerg Med* 2006; 24: 280–285.
5. **Almela P, Benages A, Peiro S et al.** A risk score system for identification of patients with upper-GI bleeding suitable for outpatient management. *Gastrointest Endosc* 2004; 59: 772–781.
6. **Rockall TA, Logan RFA, Devlin HB, Northfield TC.** Incidence of and mortality from acute upper gastrointestinal bleeding in the UK. *Br Med J* 1995; 311: 222–226.
7. **Vreeburg EM, Snel P, de Bruijne JW, Bartelsman JF, Rauws EA, Tytgat GN.** Acute upper gastrointestinal bleeding in the Amsterdam area: incidence, diagnosis, and clinical outcome. *Am J Gastroenterol* 1997; 92: 236–243.
8. **Chassaignon C, Letoumelin P, Pateron D, Group HD** 2000. Upper gastrointestinal haemorrhage in Emergency Departments in France: causes and management. *European J Emerg Med* 2003; 10: 290–295.
9. **Palmer K.** Management of haematemesis and melaena. *Postgrad Med J* 2004; 80: 399–404.
10. **Fiore FD, Leclerie S, Merle V et al.** Changes in characteristics and outcome of acute upper gastrointestinal haemorrhage: a comparison of epidemiology and practices between 1996 and 2000 in a multicentre French study. *Eur J Gastroenterol Hepatol* 2005; 17: 641–647.
11. **Courtney AE, Mitchell RMS, Rocke L, Johnston BT.** Proposed risk stratification in upper gastrointestinal haemorrhage: Is hospitalisation essential? *Emerg Med J* 2004; 21: 39–40.
12. **Hernandez-Diaz S, Garcia Rodriguez LA.** Association between nonsteroidal anti-inflammatory drugs and upper gastrointestinal tract bleeding/perforation. *Arch Intern Med* 2000; 160: 2093–2099.
13. **Henry D, Lim LLY, Garcia Rodriguez AG et al.** Variability in risk of gastrointestinal complications with individual non-steroidal anti-inflammatory drugs: results of a collaborative meta-analysis. *BMJ* 1996; 312: 1563–1566.
14. **Kaufman DW, Kelly JP, Sheehan JE et al.** Nonsteroidal anti-inflammatory drug use in relation to major upper gastrointestinal bleeding. *Clin Pharmacol Ther* 1993; 53: 485–494.

- 15. Lanas A, Bajador E, Serrano P et al.** Nitrovasodilators, low-dose aspirin, other nonsteroidal anti-inflammatory drugs, and the risk of upper gastrointestinal bleeding. *N Engl J Med* 2000; 343: 834–839.
- 16. Savage RL, Moller PW, Ballantyne CL, Wells JE.** Variation in the risk of peptic ulcer complications with nonsteroidal anti-inflammatory drug therapy. *Arthr Rheum* 1993; 36: 84–90.
- 17. Kaufman DW, Kelly JP, Wiholm BE et al.** The risk of acute major upper gastrointestinal bleeding among users of aspirin and ibuprofen at various levels of alcohol consumption. *Am J Gastroenterol* 1999; 94: 3189–3196.
- 18. Moshkowitz M, Brill S, Kornikoff FM, Averbuch M, Arber N, Halpem Z.** Additive deleterious effect of smoking on gastroduodenal pathology and clinical course in helicobacter pylori-positive dyspeptic patients. *Isr Med Assoc J* 2000; 2: 892–895.
- 19. Cohen M, Sapoznikov B, Niv Y.** Primary and secondary nonvariceal upper gastrointestinal bleeding. *J Clin Gastroenterol* 2007; 41: 810–813.
- 20. Kayacetin E, Polat H.** Üst gastrointestinal sistem kanamaları: 52 vakanin incelenmesi. *Genel Tip Derg* 2003; 13: 119–122.
- 21. Boonpongmanee S, Fleischer DE, Pezzullo JC et al.** The frequency of peptic ulcer as a cause of upper-GI bleeding is exaggerated. *Gastrointest Endosc* 2004; 59: 788–794.
- 22. van Leerdam ME, Vreeburg EM, Rauws EA et al.** Acute Upper GI Bleeding: Did Anything Change? *Am J Gastroenterol* 2003; 98: 1494–1499.
- 23. Millat B, Hay JM, Valleur P, Fingerhut A, Fagniez PL.** French associations for surgical research. Emergency surgical treatment for bleeding ulcer: oversewing plus vagotomy versus gastric resection, a controlled randomized trial. *World J Surg* 1993; 17: 568–574.
- 24. Rockall TA, Logan RFA, Devlin HB, Northfield TC.** Variation in the outcome after acute upper gastrointestinal haemorrhage. *Lancet* 1995; 346: 346–350.
- 25. De Ledinghen V, Heresbach D, Fourdain O et al.** Anti-inflammatory drugs and variceal bleeding: a case-control study. *Gut* 1999; 44: 270–273.
- 26. Avgerinos A, Nevens F, Raptis S, Fevery J.** Early administration of somatostatin and efficacy of sclerotherapy in acute oesophageal variceal bleeds: The European Acute Bleeding Oesophageal Variceal Episodes (ABOVE) randomized trial. *Lancet* 1998; 351: 911–912.
- 27. Lanas A, Perea-Aisa MA, Feu F et al.** A nationwide study of mortality associated with hospital admission due to severe gastrointestinal events and those associated with nonsteroidal antiinflammatory drug use. *Am J Gastroenterol* 2005; 100: 1685–1693.

Received November 17, 2009.

Accepted August 18, 2011.