A Clinical Profile of Acute Upper Gastrointestinal Bleeding at Moderate Altitude


Abstract

Introduction: Upper gastrointestinal bleeding (UGIB) is one of the commonest gastrointestinal emergencies. In the available studies done at high altitude, there is increased incidence of peptic ulcer with increased incidence of bleeding from it. There is limited data about upper gastrointestinal bleeding in relation to altitude, particularly of people living in the Himalayan and sub-Himalayan belt in India corresponding to high-to-moderate altitude. This is perhaps the first study of UGIB in this state and that too at moderate altitude of sub-Himalayan region.

Material and methods: All the criteria for UGIB were defined according to American Society of Gastrointestinal Endoscopists (ASGE). After initial resuscitation with intravenous fluids and/or blood transfusion, patients were considered for endoscopy or endoscopic therapy and specific therapy.

Results: Among one hundred and eleven patients, 87 (78.4%) were males. Largest number of patients were in the age group of 41-60 years (47.7%). Maximum patients, 63 (56.8%) had clinical presentation of both haematemesis and melena. History of drug intake within two days of UGIB was present in 38.7% of patients, and alcohol intake was present in 5(4.5%). History of past UGIB was present in 11.7% of the patients. Fifty-eight (59.5%) patients were given blood transfusion and 42 (37.8%) patients were haemodynamically unstable at the time of admission. Peptic ulcer disease was the commonest cause of UGIB.

Conclusion: In this clinical profile of UGIB at moderate altitude there are some similarities with UGIB at high altitude and other to low altitude data. The high incidence of peptic ulcer, high male preponderance and haemodynamical instability are similar to high altitude studies but other factors are similar to low altitude.

Introduction

The common causes of upper gastrointestinal bleeding (UGIB) include duodenal ulcer (DU), gastric ulcers (GU), erosive mucosal disease (EMD), varices of portal hypertension (PHTN) and Mallory-Weiss syndrome (MWS). Less common causes include oesophagitis, neoplasm, and angiodysplasia. With a systematic management approach, nine out of ten patients with massive upper gastrointestinal bleed can ultimately be saved. In the available data, at high altitude the incidence of peptic ulcer and haemorrhage from it is more as compared to the sea level. The incidence of peptic ulcer disease rises in the winter season and declines in summer as reported in duodenal ulcer calendar by Hall et al. The temperature at moderate altitude and at high altitude remains low, for each 150 metres rise in height, the temperature falls by 10 degrees Celsius, mimicking a prolonged winter season. It may be a physiological factor and alongwith altered blood rheology may be a contributing factor to high incidence of peptic ulcer at high altitude; though, splanchnic blood flow and metabolism are not modified by the life-long exposure to hypoxia. The problem of upper GI bleeding is quite common, and our institution is situated at a moderate altitude of 2,200 metres from mean sea level (MSL), in the sub-Himalayan ranges of North India. It is a tertiary institute and most of the patients coming to it, are from an altitude of 2,000-3,000 MSL. There is limited data about upper gastrointestinal bleeding in relation to altitude, particularly of people living in Himalayan and Sub-Himalayan belt corresponding to high-to-moderate altitude (2,000-3,000 MSL ) of North India. This study was undertaken to know the various aspects of acute upper GI bleeding at our institution.

Material and methods

All the patients who were native to the area, and satisfying...
the criteria of acute upper gastrointestinal bleed, and presented to our institution i.e., Indira Gandhi Medical College hospital from March, 1999 to February, 2000 were studied prospectively. All the terminologies like upper GI bleeding, continuous bleeding, rebleeding, haematemesis, melena, haematochezia, and severity of bleeding were defined according to the criteria of American Society of Gastrointestinal Endoscopists (ASGE)6. A detailed history was taken, general physical, and systemic examination was done, and investigations like complete haemogram, blood grouping and cross matching, blood glucose, coagulation profile, renal and liver function tests, and relevant tests for associated co-morbid conditions were done and recorded alongwith day-to-day monitoring. A set protocol for resuscitation, empirical treatment, and treatment of specific cause was made by mutual agreement between the treating team of physicians, gastroenterologists and surgeons. In resuscitation2, the planning was to put two good intravenous lines of saline, rapid assessment of patient for severity of gastrointestinal bleed, vital signs monitoring, and to get blood grouping and cross matching at the earliest. Blood transfusion indications were: shock, continuous bleeding and a haematocrit (Hct) of less than 30%. The aim was to restore a systolic blood pressure of 100 mm Hg, and an Hct of 30 - 35%, once the bleeding stops.

The empirical treatment was planned once the patient was haemodynamically stable. All the patients underwent upper GI endoscopy by fibreoptic endoscope to know the site and cause of upper GI bleed. Specific therapy was given depending upon the cause. In peptic ulcer diseases, the proton pump inhibitor omeperazole 40 mg twice daily for three to five days was given7, and endoscopic haemostatic therapy of saline, or 1: 10,000 adrenaline was given surrounding the bleeding vessel or in stigmata of recent haemorrhage. Surgery was planned whenever bleeding continued, or there was recurrent bleeding, or in case of difficulty in obtaining sufficient quantity of compatible blood. In drug-induced erosive mucosal disease, the offending drug was stopped, and gastric acid inhibitors (omeprazole 20 mg OD for 2 weeks, or famotidine 20 mg BID for 4 weeks) were given. In variceal bleeding, endoscopic sclerotherapy (EST) with intra-variceal injection of 1 to 5 ml of 1 in 10,000 diluted adrenaline or absolute alcohol, or endoscopic variceal band ligations (EVL) were done at the time of diagnostic endoscopy or later. If re-bleeding occurred, then maximum two sittings of EST within a week was given. If EST/EVL fail, then octreotide 50 - 100 gm IV bolus dose followed by an infusion at 25 - 50 gm/hr, or somatostatin 250 gm IV bolus followed by 250 gm/hr in infusion for 48 hours to five days was given. Precipitating factor(s) or complication(s) of cirrhosis were managed with the standard protocols. In Mallory-Weiss tear, gastric acid inhibitors were given and if the bleeding vessels were visible, then endoscopic haemostatic therapy planned. In reflux oesophagitis, metoclopramide 10 mg TID orally or IV, and gastric acid inhibitors were planned. Statistical analysis was done using Mantel-Haenszal and Yates corrected methods to find out the Chi-squares and p-values. A p-value of < 0.05 was considered statistically significant.

Results

One hundred and eleven patients were admitted in our hospital during the period of study with acute upper GI bleeding. All of them formally consented to participate in the study. There were 87 (78.4%) males. The largest number, i.e., 47.7% of patients were in the age group of 41 - 60 years (Table I). Maximum numbers, i.e., 77 (69.3%) were in the winter months, (Fig. 1). Clinical presentations were both – haematemesis as well as melena in 63 (56.8%) patients. Only haematemesis occurred 28.8%, and only melena in 14.4%.

Drug intake within last two days of UGIB was present in 38.7% of patients; 26.1% had taken NSAIDs, 8.1% had taken aspirin, and 4.5% had taken other drugs. Alcohol intake within last 48 hours was present in 7.2%. Drug intake within 2 - 7 days of the UGIB was: NSAIDs in 14.4%, aspirin 5.4% and others in 1.8%. Alcohol intake within 2 - 7 days was in 5 (4.5%) patients.

On clinical examination, UGIB was graded as severe bleeding in 62 (59.9%) patients; and 58 (59.5%) were given blood transfusion. Twenty (18%) patients required more than 4 units of blood, out of which 10 (11.1%) required more than 5 units of blood, and 38 (40.5%) required less than 4 units of blood. Forty two (37.8%) patients were haemodynamically unstable at the time of admission. In 56.8% patients, symptoms of upper GI bleeding stopped after one day of admission, in 19.8% on day two, and in 9% on day three, and in the rest 24.4%, it stopped on variable days after the admission.
Table I: Relation of various causes of upper GI bleeding with age.

<table>
<thead>
<tr>
<th>Age in yrs</th>
<th>DU</th>
<th>GU</th>
<th>PHTN</th>
<th>EMD</th>
<th>MWS</th>
<th>Reflux</th>
<th>Tumors</th>
<th>Total</th>
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<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
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<td></td>
<td>2</td>
</tr>
<tr>
<td>21 - 30</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>31 - 40</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>41 - 50</td>
<td>11</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>51 - 60</td>
<td>10</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>61 - 70</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
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<tr>
<td>&gt; 71</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>12</td>
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<tr>
<td>Total</td>
<td>48</td>
<td>19</td>
<td>12</td>
<td>13</td>
<td>12</td>
<td>3</td>
<td>4</td>
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</table>

(6.3%) patients died – one had duodenal ulcer, 2 had carcinoma of the stomach, and 4 died of variceal bleeding ($X^2 = 32.37, p < 0.01$ for death).

In our report, variceal bleed was in 10.8% and is uncommon above 60 years of age, but was common (75%) in 31 - 60 years age. The clinical evidence of portal hypertension was present in 66.7%, and 8.3% had a past episode of UGIB. Associated illness was present in 41.7%. Haemodynamic instability was present in 58.3%, and severe bleed was present in 75%. Endoscopic sclerotherapy was given to 16.6%, somatostatin and octreotide to 16.6%. There were 4 deaths in this group, which constitute 30% of this group and 3.6% of the overall report. This occurred despite the sclerotherapy and EVL of varices.

Associated illness of the cardiovascular system was present in 7 (6.3%), respiratory system in 12 (6.3%) and renal disease in 4 (3.6%). History of liver diseases other than portal hypertension was present in 2 (1.8%) and other illnesses in 4 (3.6%) of the patients.

**Discussion**

In this study of acute UGIB, males were three times more commonly affected than females. A similar male preponderance of 98% is described in another study from high altitude, although the incidence among men is approximately double that of women in other studies. The largest numbers of patients (47.7%) were in the age group of 41 to 60 years, which is not similar to other studies of high altitude where it is 38% in 30-39 years age group. The maximum number of patients, i.e., 77 (69.3%) were...
seen in the months November through April, which coincide with the coldest times of the year in this region, and is similar to the duodenal ulcer calendar as reported by Hall et al. The commonest presentation was haematemesis and melena in over half of the patients like other studies from high altitude8,9 or low altitude3, which predict massive bleeding. Forty-two (37.8%) patients were haemodynamically unstable at the time of admission – most of them from DU, GU, or portal hypertension group. Sixty-six (59.5%) patients required blood transfusion – similar to the Villanueva J et al9 study at high altitude. The number of blood transfusions is the index of severity; 20 (18%) required more than four blood transfusions, and 13.8% five or more than five blood transfusion. Again, most of them were in DU, GU, and variceal bleed. Clinical presentation of haematemesis and melena, haemodynamical instability, and requirement of more blood transfusions are the indicators of excessive bleeding.

Clinical assessment is rather poor at predicting the source of upper GI bleeding; physicians are correct in only 40% of cases2, but in our study, the relationship between clinical impression and final diagnosis after upper GI endoscopy was highly significant with $x^2 = 236.47$ and $p = < 0.001$. None of the patients had negative endoscopy, which is unexplainable. The frequency with which stigmata of recent bleeding are seen varies from series to series (4 - 39%)10,11. In our study there were 11 (9.9%) patients with stigmata of recent haemorrhage in peptic ulcer disease; out of them 10 were given endoscopic injection therapy. Only 5 (4.5%) patients had rebleeding in hospital, and 3 (2.7%) were taken for surgery. The low percentage of surgical intervention in our study may be due to early endoscopic intervention for oesophageal varices and peptic ulcers. There were 7 (6.3%) deaths only, and this is similar to an overview of upper GI bleeding by F. Van de Mierop in 199612, and to a high altitude study9 where it was 4.3%.

Duodenal ulcers were the commonest cause (43%) of upper GI bleed in this series and this finding is unlike other high altitude studies where gastric ulcers (31%) were the commonest cause of it; however, our results are similar to studies from the low altitude4,13 regions. Duodenal ulcer bleed was also the commonest cause of UGIB in 41 - 60 years of age. It presented commonly (64.6%) with haematemesis and melena. It has been estimated that more than 30 million people all over the world consume NSAIDs daily14 and numerous studies have documented the toxic effect of NSAIDs on the gastrointestinal mucosa. In this series, 37.5% patients gave history of NSAIDs, aspirin, and other drugs intake within 48 hours, the probable precipitating factors. Extending this duration to 7 days, the percentage was further increased by 18.76%. NSAIDs, aspirin, can cause bleeding ulcer and also increase the chances of bleeding from pre-existing ulcers15. Alcohol was a probable precipitating factor in 12.5% of DU patients. In other studies, an overall 18% of patients of upper GI bleed had alcohol as a precipitating factor15. In 78.4% patients, ulcer-like symptoms were present before onset of UGI bleeding. Laszlo et al16 found frequent absence of preceding symptoms in upper GI bleeding patients regardless of NSAIDs use.

The final diagnosis of gastric ulcer was in 19% of the patients, and it is less than the other high altitude studies3,8,9, but the overall incidence of peptic ulcer disease was 67% and is more than the studies at low altitude. In our study at moderate altitude, in gastric ulcer patients, there was history of drug intake in the last 48 hrs in 36.9% of patients and in 31.6% in the last 7 days, but none of the patients had taken alcohol.

Large ASGE survey6 reported erosive mucosal disease as a cause of upper GI bleed in 23% of patients; a similar incidence is reported by the high altitude study8. In our study EMD was the cause of UGIB in 11.7%, affecting all ages, and is similar to another study from high altitude8 in which low incidence of 6.1% was reported. Thus the incidence of UGIB due to EMD in our clinical profile lies in-between the high and low altitude. The incidence of bleeding from stress ulcer-related gastric mucosal injury or ulceration appears to have decreased dramatically since 1980, most likely as a result of better intensive care of critically ill patients17.

Portal hypertension is responsible for several sources of upper and lower gastrointestinal bleeding, including oesophageal varices, gastric varices, ectopic varices in the small and large intestine, congestive gastropathy, and a higher incidence of peptic ulcer. We found 12 (10.8%) patients of bleeding varices but no bleeding gastropathy,
and this is similar to the ASGE survey\textsuperscript{6} that found 10% of patients of bleeding from varices. No data is available in reference to varices at various altitudes.

Mallory-Weiss syndrome was the causes of upper GI bleed in 10.8% and was present in all ages; it is similar to other studies\textsuperscript{18}. Nearly 50% of MW tear bleeders were 21 to 40 years of age, and it is a common age for the MW tear\textsuperscript{18}. Other studies at high altitude have not reported the incidence of MWS.

**Conclusion**

This clinical profile of acute upper gastrointestinal bleeding at moderate altitude is a non-randomised study. It revealed some similarities with other studies of UGIB at high altitude, and some studies with UGIB at low altitude. The similarities with published high altitude studies were high incidence of peptic ulcer, duodenal ulcer, very high male preponderance, haemodynamic instability, and requirement of more blood transfusions. The dissimilarity with the high altitude studies was lower incidence of gastric ulcer despite peptic ulcer being the commonest cause. The gastric ulcer had no relation to the alcohol intake. The incidence of MWS, incidence and mortality of oesophageal varices, overall mortality, and need for surgery were similar to low altitude. There is high prevalence of UGIB in the winter season at moderate altitude.

**References**