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Upper Gastrointestinal Hemorrhage: A Narrative Review

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1. Abstract

Upper gastrointestinal bleeding is the most common gastrointestinal emergency with a mortality rate of 2-10% reported in the literature. H. pylori and NSAID therapy are the two most common causes of upper GI bleeding. Fortunately, anti-H. pylori regimen and proton pump inhibitors respectively are the most effective strategies for the treatment of UGIB. If Glasgow- Blatchford score is ≤1 consider outpatient management and endoscopy. After hemodynamic assessment and resuscitation with fluids and blood transfusion as indicated, a proton pump inhibitor with a prokinetic agent may be considered. Patients with varices secondary to cirrhosis should receive vasoactive drugs, antibiotics followed by endoscopic variceal band ligation. Endoscopy for identifying the cause and Endoscopic intervention for treatment of UGIB should be done within 24hrs. Early assessment and management of comorbidities are associated with better outcomes.

2. Introduction

Acute upper gastrointestinal (GI) haemorrhage is the most common gastrointestinal emergency accounting for 50-170 admissions to hospitals per 100000 of the population each year in the UK. Mortality rates vary between 2 and 15 per cent. There is some evidence that outcome is better when individuals are treated in specialized units. Upper gastrointestinal bleeding (UGIB) is defined as any blood loss from a gastrointestinal source above the ligament of treitz. It can present as hematemesis (bright red emesis or coffee-ground emesis), melena or hematochaezia. Rarely patients can also present as syncopal episodes, fatigue, and weakness secondary to blood loss [1].

3. Etiology

Common etiologies include Peptic Ulcer Disease (PUD) (40-50%), erosive esophagitis (11%), duodenitis (10%), Varices (5%- 30%), Mallory-Weis tear (5%-15%) and vascular malformations (5%). PUD can be caused by NSAIDs, Helicobacter pylori, and stress-related mucosal demage [2, 3].

4. Epidemiology

The most common cause of gastrointestinal bleeding is upper GI bleeding accounting for 75% of cases. Incidence varies between 80-150 per one lakh population annually. An increased number of cases with GI bleeding has been reported in patients taking aspirin/aspirin + clopidogrel. It's not surprising to find that risk increases further with the triple combination (Aspirin, clopidogrel and vitamin k antagonist) [4].

5. Presentation

Common presentations (table 1) include hematemesis, melena and rarely hematochezia (brisk UGIB). Hematemesis is the vomiting of blood or clots. Melena is the passage of dark and tarry appearing stools. Hematochezia refers to the passage of fresh blood per rectum. Patients may report epigastric pain secondary to peptic ulcers. In Mallory-Weiss tear, vomiting or coughing precedes hematemesis. In esophageal varices, patients have stigmata of liver disease such as jaundice, weakness, fatigue, anorexia and ascites. In cases of underlying malignancy in the GI tract, patients present with weight loss, decreased appetite or difficulty in swallowing [5]. History of previous episodes as well as identification of comorbidities is important in the medical management of bleeding. GI bleeding secondary to intake of NSAIDs, antiplatelet's and drugs associated with esophagitis can be identified by taking medication history and modifying treatment accordingly.

Table 1: Typical presentation of GI Bleed

Upper GI Bleed	Non-specific GI bleed	Lower GI Bleed
• Hematemesis	• Hemodynamic instability	• Hematochezia
• "Coffee ground" emesis	• Epigastric pain	
• Melena	• Fatigue/lethargy	
	• Syncope anemia	
Hematemesis-vomiting of fresh blood *"Coffee ground" emesis- vomiting of dark, gastric acid-exposed blood* *Melena-black, tarry stools* *Hematochezia-passage of fresh blood in feces*		

6. Clinical Assessment

Prognostic score assessments such as Blatchford score (table 2) and Rockall scale (table 3) are used to stratify patients as low or high risk. Low scores are associated with less risk of adverse outcomes. These scoring systems predict the risk of rebleeding and mortality using clinical, laboratory and endoscopic parameters. Initial investigations such as CBC, LFT, Coagulogram help us to make timely interventions by identifying severity. Patients with severe blood loss may develop shock. Hence, volume resuscitation to improve hemodynamic stability is done. Factors associated with poor outcomes include advanced age, diabetes, hypertension, immunosuppression, hypovolemic shock and raised INR [7].

Table 2: Blatchford Score

Admission criteria	Score
BUN (mg/dl)	
≥18.2 to <22.4	2
>22.4 to 28.0	3
>28.0 to 70.0	4
>70.0	6
Hemoglobin men (g/dl)	
≥12.0 to <13.0	1
≥10.0 to <12.0	3
<10.0	6
Hemoglobin women (g/dl)	
≥10.0 to 12.0	1
<10.0	6
SBP (mmHg)	
100 to 109	1
90-99	2
<90	3
Other markers	
Pulse ≥100bpm	1
Presentation with melena	1
Presentation with syncope	2
Hepatic disease	2
Cardiac failure	2
Score 0: minimum risk for needing transfusion, endoscopy or surgery • *Consider out patient management* *Score >0: increased risk for needing transfusion, endoscopy or surgery* *Consider inpatient management*	
BUN-blood urea nitrogen, bpm-beats per minute	

Table 3: Rockall score

Component	Score			
	0	1	2	3
Age 9years)	<60	60-79	>80	
Shock	No shock	SBP ≥100mmHg Pulse ≥100bpm	SBP <100mmHg Pulse ≥100bpm	
Comorbidities	None		CHF, IHD, other major morbidity	Renal failure, liver failure or disseminated malignant disease
Diagnosis Evidence of bleeding	Mallory-Weiss None	All other diagnoses GI bleeding	GI malignancy Blood, adherent clot, Spurting vessel	
Interpretation-Rates by Complex Risk Score				
	Score	**Rebleed**	**Deaths (total)**	
	0	4.90%	0%	
	1	3.40%	0%	

	2	5.30%	0.20%	
	3	11.20%	2.90%	
	4	14.10%	5.30%	
	5	24.10%	10.80%	
	6	32.90%	17.30%	
	7	43.80%	27.00%	
	8+	41.80%	41.10%	

Bpm-beats per minute, CHF-congestive heart failure, GI-gastrointestinal, IHD-ischemic heart disease, SBP-systolic blood pressure

7. Management

Analyzing hemodynamic parameters and performing resuscitation is the initial goal of treatment. Patients with hypovolumic shock require prompt action by administering crystalline or colloid fluids to restore blood pressure. In case of ongoing haemorrhage or continuous blood loss, blood transfusion should be started. It is recommended to commence transfusion in patients with haemoglobin level ≤7 g/dl; however, some patients have a higher threshold such as patients with severe bleeding and hypotension. For patients presenting with coagulopathy having an INR>1.5, appropriate fractionated blood products to correct INR should be given [22]. Comorbidities in patients presenting with UGIB cause most deaths, so assessment and identification of these comorbid conditions is key in the management of these patients.

In nonvariceal UGIB Proton Pump Inhibitors (PPIs) should be given. Patients reporting significant bleed must be instituted 80 mg bolus of PPI followed by a continuous infusion at the rate of 8 mg per hour. If Endoscopy reveals high-risk lesions, PPI infusion should be continued for 72 hrs. Stop the infusion if endoscopic studies are normal or reveal low-risk lesions and the patient can be discharged on oral PPIs [21].

In patients with cirrhosis, it is recommended to start vasoactive drugs such as Terlipressin, somatostatin or its analog octreotide and vapreotide when variceal hemorrhage is suspected. These drugs cause splanchnic artery vasoconstriction which helps to control bleeding [20]. If variceal bleed is suspected. Octreotide is given as bolus dose of 20 mcg to 50mcg followed by continuous infusion at a rate of 25mcg to 50mcg per hour [21]. In addition, patients with cirrhosis and UGIB antibiotics should be continued for up to seven days to prevent spontaneous bacterial peritonitis. TIPS should be considered in patients with recurrent Variceal hemorrhage [8-12, 18].

8. Endoscopy

It has been seen that 80% of UGIB resolves spontaneously without any intervention and 20% of cases tend to recur. Patients deemed to be at low risk based on assessment can be managed as outpatients; however, patients falling in moderate to the high-risk group should undergo endoscopy within first 24 hrs. Endoscopy helps in identifying the source of the bleed and assess for stigmata of residual hemorrhage. Intervention is done if necessary to stop bleeding. At times to remove particulate matter including blood and get a clear picture, nasogastric lavage is performed before endoscopy. Nasogastric lavage is found useful in patients who have no hemodynamic compromise with no signs of hematemesis. High-risk lesions often present with evidence of fresh blood in the nasogastric aspirate [23].

Predictors of high risk of rebleeding [13] in patients with non-variceal UGIB are:

a) Ongoing bleed.

b) Visible vessel with no bleeding

c) Ulcer ≥2cm

d) Ulcers found on the posterior aspect of the duodenum or posterior part of lesser gastric curvature. [13]

Endoscopic interventions such as ligation and tissue glue for esophageal and gastric varices respectively should be done to stop the ongoing bleed. Trans-Jugular Intrahepatic Portosystemic Shunt (TIPS) is preferred in recurrent cases of variceal bleed. For high risk non variceal bleed procedures such as injections, clips, thermal probes are used to stop the bleeding from culprit vessel. [19] For recurrent ulcer bleeding interventional radiology or surgery is done as indicated. For peptic ulcer bleeding not controlled by endoscopic therapy meta-analyses of two recent observational studies that compared surgery with radiological intervention reported lower rebleeding with surgery but similar mortality and need for further interventions, although patients receiving radiological intervention were older and in worse general health. [17] In patients who require antithrombotic agents, early reintroduction of these medicines appears to produce better outcomes [15, 16].

8.1. Emerging Treatments

Hemostatic powder spray is effective in controlling hemostasis for active non-variceal bleed but rebleeding rates are relatively high which suggests a temporary effect [24]. A randomised controlled trial of 66 patients who had recurrent bleeding ulcer after achieving hemostasis showed that significantly fewer patients treated with over the scope clips had further bleeding compared with those on standard therapy (15% v 58%) [25].

9. Conclusions

Upper gastrointestinal bleeding is a common medical emergency presenting to hospitals worldwide. The evidence of improved outcomes from a relatively restrictive approach to blood transfusion and risk stratification into low and high risk have recently altered clinical practice and these alterations to management are recommended by international guidelines. Studies have confirmed a benefit from pre-endoscopy antibiotics and vasoactive drugs in patients with cirrhosis and post-endoscopy high dose PPIs for high-risk peptic ulcer bleeding. Endoscopic therapy has advanced with recent additions including hemostatic powder spray, over-the-scope clips, and dop-

pler probes in addition to widely studied injection therapies, thermal probes, and clips used for non-variceal bleeding. Also, endoscopic band ligation as well as tissue adhesive injection is used for variceal bleeding. Interventional radiology for persistent or recurrent upper gastrointestinal bleeding that is refractory to endoscopic treatment is used as a rescue therapy. Surgery is reserved for situations in which interventional radiology is unavailable. Recent data suggests early re-introduction of antithrombotic/antiplatelet drugs once hemostasis has been achieved is the best approach in those with appropriate cardiovascular indications.

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