

## Emergency Management of Upper GI Variceal Bleeding

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### ABSTRACT

**Background:** Upper gastrointestinal bleeding is the most common gastrointestinal cause of admission in emergency departments worldwide with about 10% inpatient mortality rate that has not decreased during the last three decades.

**Aim:** In this review, we aim to study the pathophysiology behind the development of upper gastrointestinal bleeding, and explore the approach to its management in emergency situation.

**Materials and Methods:** We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 2001, through February 2017. The following search terms were used: upper gastro intestinal bleeding, variceal bleeding, emergency management of gastrointestinal hemorrhage, varices, esophageal bleeding.

**Results:** Managing patients with bleeding varices must have two goals that should be considered: to stop the bleeding, and to prevent rebleeding since 60% of patients will rebleed after the acute bleeding was stopped leading to a mortality rate of 33%, unless adequately treated.

**Conclusion:** Bleeding varices are always considered urgent emergencies due to associated morbidity and mortality. Moreover, bleeding varices can cause hemodynamic instability and end-organ failure. The most important intervention is therapeutic endoscopy. Other approaches include vasoactive drugs, and prophylactic antibiotics. After acute management of the bleeding, patients should undergo further evaluation and treatment to prevent the recurrence of another bleeding.

**Keywords:** emergency management of gastrointestinal hemorrhage, varices, esophageal bleeding, upper gastro intestinal bleeding, variceal bleeding.

### INTRODUCTION

About 150 per 100,000 persons every year suffer from upper gastrointestinal bleeding (UGIB), making it a major health problem. UGIB is the most common gastrointestinal cause of admission in emergency departments worldwide with about 10% inpatient mortality rate that has not decreased during the last three decades, despite all improvements in the medical field. Recent research reported a significant mortality rates following bleeding (0.64%), compared to mortality after myocardial infarction (0.77%), after adjustment for other confounders. Hemorrhage from a bleeding varices is a fatal outcome of cirrhosis, and thus a serious emergency<sup>[1]</sup>.

Bleeding varices in cirrhotic patients have an overall mortality rate that ranges between 10-20%. Before 1980, mortality from varices was about 40%, but it has since decreased, especially with improvements in the intensive care resuscitation

techniques, emerge of drugs with vasoactive affects, endoscopy, and prophylactic antibiotics. When managing cirrhotic patients with bleeding varices, there are two goals that must be considered: to stop the bleeding, and to prevent rebleeding. About 60% of patients will rebleed after the acute bleeding was stopped with 33% mortality rate, unless it was treated adequately<sup>[2]</sup>.

### METHODOLOGY

#### • Data Sources and Search terms

We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 2001, through February 2017. The following search terms were used: upper gastro intestinal bleeding, variceal bleeding, emergency management of gastrointestinal hemorrhage, varices, esophageal bleeding.

**The study was done after approval of ethical board of Dammam university.**

**• Data Extraction**

Two reviewers have independently reviewed the studies, abstracted data, and disagreements were resolved by consensus. Studies were evaluated for quality and a review protocol was followed throughout.

**Management of acute bleeding**

A multifactorial approach must be taken into consideration when managing acute bleeding. This multifactorial approach must include resuscitation, blood transfusion, vasoactive drugs administration, diagnostic and therapeutic endoscopy performed within 12 hours of admission, prophylaxis with antibiotics, and assessment of the need of a transjugular intrahepatic portosystemic shunt (TIPS). However, not all these steps are usually done in this order in patients with acute bleeding, and they need to be done simultaneously in order to succeed [3].

**Evaluation and resuscitation**

When managing acute variceal bleeding, the first step is proper evaluation and resuscitation. This must ideally occur in the intensive care unit, by a team of specialists including hepatogastroenterologists/endoscopists, intensivists, and nurses. Unfortunately, this is not always the case, and many patients are treated in the emergency department rather than the intensive care unit, before being moved their later. Therefore, the physicians' team in the emergency department must be adequately trained to deal with variceal bleeding cases, and a gastroenterologist should always be present [3].

After admission of these patients, the next essential step is to confirm the presence of cirrhosis as an etiology for the bleeding. This can be done using either information from the patient's history, or from laboratory investigations that will show coagulopathy, thrombocytopenia, and/or elevated liver enzymes. When the patient is in a high-risk group, immediate intervention should be provided [4].

It is essential to assess airway, but no strong evidence supports prophylaxis with endotracheal intubation, as this did not decrease the rates of cardiovascular events, aspiration pneumonia, or mortality. Some physicians recommend endotracheal intubation before endoscopy in cases with acute

bleeding with hemodynamic instability, agitation, and/or coma. After providing airway protection, a peripheral venous access should be established with placing a venous central line. In order to maintain a systolic blood pressure higher than 100 mmHg, volume replacement will be administrated. Physicians must always be careful not to overload patients, as that will lead to hemodynamic instability, with failure of management and risk of rebleeding [5].

Patients' hemoglobin levels should be kept between 7-8 g/dl. In order to maintain this, blood transfusion can be administrated in selected patients. This is sometimes associated with decreased rates of rebleeding and complication rates. Blood transfusion can also improve survival rates, as proved by recent studies [4].

**Vasoactive therapy**

Ideally, vasoactive drugs should be given on the way to the hospital, or immediately after admission and before performing endoscopy. In cases of suspected varices, treatment with vasoactive drugs should continue for five days. This procedure solely will achieve hemostasis and decrease mortality in up to 80% of patients [6].

Vasoactive drugs should be administered immediately, ideally during transport to the hospital or on admission, before endoscopy, if variceal bleeding is suspected, and should be continued for 5 days. This is one of the most important procedures to diminish mortality and it achieves hemostasis in 80% of patients [7].

Vasoactive is not anymore used in bleeding varices because of various adverse events. Other vasoactive drugs include octreotide, terlipressin, vapreotide, and somatostatin. These drugs differ between countries. The only approved vasoactive drugs in the USA in cases of bleeding varices is octreotide. These drugs act by causing vasoconstriction in splanchnic vessels causing a decrease in portal pressure, and leading to stoppage of the bleeding [8].

Somatostatin acts by inducing splanchnic vasoconstriction causing reduced portal pressure. For trials compared somatostatin with placebo and proved benefit with somatostatin use, with an overall decrease in the risk by 17%. Vasopressin showed similar efficacy when compared with somatostatin. However, it caused a significant increase in adverse events rate. When a regimen of somatostatin alone

was compared with somatostatin and sclerotherapy, this combination therapy showed the best results <sup>[9]</sup>.

Octreotide is a somatostatin analog that has similar effects of somatostatin but a longer half-life. No sufficient evidence is present in literature to support its use alone, with sclerotherapy, or with balloon tamponade. Most studies on octreotide were not of high quality, not randomized, and not adequately powered. However, a recently published meta-analysis of available data has concluded that octreotide was more efficient than placebo, vasopressin, or sclerotherapy, when managing acute bleeding varices. Moreover, octreotide has a relatively safe profile and can be given outside the intensive care unit <sup>[10]</sup>.

Octreotide works by decreasing the flow of splanchnic blood and portal pressure. Therefore, it is effective in the setting of acute bleeding. Until the source of bleeding is detected with endoscope, octreotide is administered to all patients with active hematemesis <sup>[11]</sup>.

### **Antibiotic prophylaxis**

Over the last twenty years, it has been established that cirrhotic patients with active bleeding varices are at an increased risk of bacterial infections. These infections are associated with higher rates of early rebleeding, and higher mortality rates, especially in cases of decompensated cirrhosis. In recent years, the rate of bacterial infections following variceal bleeding has been decreasing due to the routine administration of antibiotics prophylaxis. Consequently, this caused a significant decrease in rebleeding and mortality rates <sup>[12]</sup>.

Recommended prophylactic antibiotics protocols include 200 mg of IV ciprofloxacin, or 400 mg of oral norfloxacin, both are given twice a day. When patients have advanced decompensated cirrhosis, ceftriaxone showed better outcomes than norfloxacin <sup>[13]</sup>.

### **Endoscopic treatment**

Ideally, upper GI endoscope is better performed within the first twelve hours of admission. When a diagnosis of bleeding varices is made, endoscopic therapy is performed. The diagnosis must follow these criteria: the presence of active variceal bleeding, the presence of fibrin clot (white nipple), the presence of fresh blood in the stomach, and the absence of another cause of bleeding <sup>[6]</sup>.

After confirming the diagnosis, endoscopic band ligation is performed and is preferred due to higher efficacy and fewer side effects than sclerotherapy. However, endoscopic band ligation is associated with superficial ulcerations, esophageal strictures, and rebleeding sometimes. In cases where band ligation is difficult, sclerotherapy can be performed. These cases include the presence of large amount of blood. Moreover, sclerotherapy provides a less expensive technique. The best and most effective treatment is the combination of endoscopic therapy and vasoactive drugs. This was proved in many trials and meta-analyses <sup>[14]</sup>.

### **Failure of bleeding control or rebleeding**

When all previous approaches fail in bleeding control, a change in treatment is indicated. If the patient is stable, a second therapeutic endoscopy is an option. However, in cases of gastric varices, a second endoscopy is contraindicated, and another approach should be performed. High doses of vasoactive drugs can be given <sup>[15]</sup>.

In unstable cases, a balloon tamponade should be considered as an attempt to control the bleeding, until definitive therapy is performed. This approach is effective and successful in up to 80% of cases. However, without further management, up to 50% of patients will rebleed as soon as the balloon deflates. Complications of balloon tamponade include aspiration, necrosis, esophageal perforation, and migration. These complications can be reduced by keeping the balloon for 24 hours. In conclusion, this technique is only a temporary therapy until another definitive treatment is performed <sup>[16]</sup>.

In severe cases, where bleeding varices could not be controlled with all previously mentioned approaches, or bleeding recurs, covered TIPS is used as a salvage therapy. Late intervention of these patients is associated with higher mortality and lower survival <sup>[15]</sup>.

### **CONCLUSION**

Acute gastrointestinal bleeding continues to be a common cause for gastrointestinal emergency admissions, and can be associated with severe fatal outcomes. The commonest bleeding source in cirrhotic patients is variceal bleeding caused by portal hypertension. Bleeding varices are always considered urgent emergencies due to associated morbidity and mortality. Moreover, bleeding varices can cause hemodynamic instability and end-organ

failure. Other complications include aspiration and/or suffocation. Hepatic encephalopathy can be exacerbated with accumulation of blood in the gastrointestinal tract. Proper management of acute gastrointestinal bleeding needs multifactorial approach with highly trained physicians and stepwise protocols. The most important intervention is therapeutic endoscopy. Other approaches include vasoactive drugs, and prophylactic antibiotics. After acute management of the bleeding, patients should undergo further evaluation and treatment to prevent the recurrence of another bleeding.

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