SEVERE GASTROINTESTINAL BLEEDING GUIDELINE

INTRODUCTION

Severe GI bleeding is defined as bleeding associated with hemodynamic instability and/or a rapid decline in Hb concentration.

Consider consulting Gastroenterology, Hematology and General Surgery.

RESUSCITATION

Initial investigations should include CBC, coagulation studies, LFTs, renal function tests and blood group and crossmatch of 1-4 Units of packed RBCs depending on the size of the child.

Rapid correction of any coagulopathy should be undertaken. INR > 1.5 and/or platelets count < 50,000 should be corrected. Platelets should also be considered for patients receiving anti-platelet medication such as aspirin. Warfarin can be reversed more rapidly with Octaplex® (prothrombin complex) and Vitamin K than with fresh plasma and Vitamin K.[1] [2]

Unless the patient is exsanguinating, a restrictive transfusion strategy (transfusion threshold of Hb < 7 g/L has been shown to reduce the need for transfusions, reduce the number of transfusions, reduce rebleeding and reduce mortality in adults with acute upper GI bleeding mostly of peptic ulcer and variceal etiology, provided that endoscopy is performed with 5 hrs of presentation.[3] A higher threshold for transfusion of < 9 g/L is appropriate for patients at risk of complications of anemia e.g. underlying heart disease.

Patients with variceal bleeding should not be transfused to a Hb > 10 g/L, as worsening bleeding can be precipitated.[4]

Consider activation of the massive transfusion protocol when bleeding exceeds half of blood volume (40 ml/kg in infant) within 3 hrs and/or exceeds 0.5 ml/kg/MIN.[5]

Large bore IV or IO access x 2 should be obtained as soon as possible. A large single bore > 5F CV catheter (e.g. 6F pacing sheath/cordis) may be required to allow for rapid infusion rates.

If resuscitation with blood and fresh plasma ± platelets using the RAPID TRANSFUSER (Fast Flow Fluid Warmer Level 1 – see PICU website 'Equipment' section for manual) cannot maintain hemodynamic stability, consider intermittent boluses of epinephrine or an epinephrine infusion.

Severe upper GI bleeding may precipitate hepatic encephalopathy in patients with liver disease – see ACH PICU Hepatic Encephalopathy Guideline.

UPPER GI BLEEDING IN CHILDREN

Upper GI bleeding is defined as bleeding proximal to the duodenojejunal junction (ligament of Trietz). It usually presents with hematemesis and/or melena. Only 20% of all cases for GI bleeding in children arise from the upper GI tract. The incidence is not well established, but in the PICU population may be as common as 6-25% of all admission when defined as any amount of new or old blood visualized in the NG tube.

ETIOLOGY BY AGE:

Neonate

- Swallowed maternal blood
- NG tube irritation/erosion
- Hemorrhagic disease of the newborn or DIC
- Stress gastritis or ulceration
- Necrotizing enterocolitis
- Congenital vascular abnormalities of GIT
- Milk protein allergy

Infants and Children

- Swallowed URT or LRT blood
- NG tube irritation/erosion
- Mallory Weiss tear
- Gastritis and ulcers – usually caused by NSAIDs
- Esophagitis
- Variceal bleeding
- Foreign body ingestion
- Helicobacter pyloric infection
- Vascular abnormalities e.g. hemangioma or telangectasia

The most common causes of severe upper GI bleeding in children are esophageal varies and ulceration.

Apart from the comments in the introduction, severe upper GI bleeding may require airway management to prevent blood aspiration. In such cases at least 2 large bore suction catheters should be available during intubation to allow visualization of the airway in the presence of orophargnygeal blood.

Specific Management

- Proton pump inhibitors in high doses reduce rebleeding rate, need for transfusion and hospital stay in adults with peptic ulcer disease related bleeding.[6] H2 receptor antagonists are less effective.[7] No studies exist in children. Omeprazole has been the most studied in adult patients, but is only available in IV form by special access.
  START IV pantoprazole loading dose of 2 mg/kg (MAX 80 mg) followed by infusion of 0.2 mg/kg/HR (MAX 8 mg/HR) for 72 hours.
- Octreotide reduces the risk of rebleeding in variceal haemorrhage and non-variceal haemorrhage and may reduce active bleeding.[8] [9] Optimal dose and duration of therapy is unclear. Octreotide can cause heart block and asystole even at low doses and in the absence of heart disease.[10] It may have a role in peptic ulcer bleeding as well.[11] [12] Terlipressin is considered by some to be the drug of choice in adults as it is the only drug shown to decrease mortality, but it is not available in Canada. START IV octreotide 1 mcg/kg bolus followed by 1 mcg/kg/HR infusion (range 0.5 - 2 mcg/kg/HR).

- Erythromycin given as a single IV dose 30-90 min before endoscopy reduces the need for a relook endoscopy and improves visualization of the stomach in adults.[13]

CONSIDER IV erythromycin 3 mg/kg single dose.

- Antibiotics (prophylactic) reduce infectious complications and rebleeding in adults with cirrhosis and variceal bleeding and may reduce mortality e.g. ceftriaxone 1 g/day.[14]
- Endoscopy for diagnosis and application of thermal coagulation (ulcers) or sclerotherapy or banding (varices) – there are several adult studies of early (< 12-24 hrs versus later endoscopy suggesting a mortality benefit from early intervention for both variceal and ulcer bleeding.[15]
- Interventional Radiology – some sources of bleeding that are not amenable to an endoscopic approach may be localized and treated via IR. Also the TIPS procedure to relieve portal hypertension in uncontrolled variceal bleeding is a consideration, but can lead to severe hepatic encephalopathy.[16]
- Surgery – surgical intervention (e.g. portosystemic shunt or mesenterico – left portal shunt) is rarely required urgently.

Insertion of NG tube to aspirate gastric contents and detect further bleeding is required, but nasogastric lavage is not thought to be useful.[17]

Balloon tamponade (Sengstaken-Blakemore,[18] Minnesota and Linton tubes[19]) may be considered as a bridge to TIPS or in other forms of refractory distal esophageal bleeding.[20] STARS carry the Linton tube.

Tranexamic acid has not been shown to be effective in adults with acute upper GI bleeding.[21]

There are several adult scoring systems to predict mortality is the context of acute upper GI hemorrhage (Rockall, Glasgow Blatchford, modified Glasgow Blatchford, AIM65) but they are not likely to accurately predict mortality in pediatric patients.

LOWER GI BLEEDING IN CHILDREN

Lower GI bleeding presents as hematochezia (bright red blood per rectum).

ETIOLOGY:

Note: Melena can be from proximal small bowel bleeding if the rate of bleeding is slow.

- Fresh red blood per rectum (hematochezia) can occur after severe upper GI bleeding, especially in small infants.
- Anal fissure.
- Intussusception (classically red currant jelly stool).
- Meckel's diverticulum.
- Enterocolitis (infectious, inflammatory bowel disease, NEC and obstructive (Hirschsprung's, volvulus), neutropenia induced (typhilitis), allergic (cow's or soy milk protein sensitivity), gut duplication cysts with gastric tissue and fistula connection to GI tract.
- Coagulopathy (e.g. haemophilia).
- HUS
- Henoch-Schonlein purpura.
- Juvenile polyps, adenomatous polyps and other stromal tumors (GIST).

SPECIFIC MANAGEMENT:

Resuscitation is the first priority, followed by establishing the diagnosis and operative management of conditions requiring urgent surgery (e.g. volvulus, Meckel's, perforated NEC) and medical management of the underlying medical condition (e.g. HUS).

There is no proven role for octreotide in lower GI bleeding, but cases of massive lower GI bleeding in children post hematopoietic stem cell transplantation have been successfully treated with octreotide sometimes in combination with rFVIIa.[22] Its use in bleeding from Meckel's diverticum is described.[23] There are also case reports of adults with portal hypertensive colopathy successfully treated with octeotide.[24]

After stabilization, the role of urgent versus more elective colonoscopy is debated in the adult literature, though adult patients often present with bleeding diverticular disease, a condition rare in children. It remains unclear if urgent colonoscopy is routinely required.[25] If the bleeding source is not located and managed by colonoscopy, then further imaging with CT angiography, radionuclide imaging (99m Tc colloid or labelled rbc), or angiography can be helpful.

IR embolization of severe intestinal bleeding is reported to be successful, but is associated with up to a 20% rate of intestinal infarction.[26]

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