Acute Upper Gastrointestinal Bleed (AUGIB): clinical review.

Published in Gastrointestinal Nursing 20 (5), 20-26 (June 2022)

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Abstract:

Acute upper gastrointestinal bleeding (AUGIB) is one of the commonest medical emergencies, with around 85,000 cases per year in the UK (The National Confidential Enquiry into Patient Outcome and Death (NCEPOD), 2015) and carries a 10 percent hospital mortality rate (National Institute for Health and Care Excellence (NICE), 2016). Despite significant improvements in treatments this mortality rate has not improved significantly in the last 50 years (British Society of Gastroenterology (BSG), 2015). Interestingly, deaths are rarely directly associated with exsanguination but are related to poorly tolerated blood loss and resultant shock, aspiration, and complications of therapeutic procedures. As such, mortality from AUGIB is strongly associated with advanced age and presence of severe comorbidity (Holster and Kuipers 2012). This clinical review will define what AUGIB is, and discuss the treatment, and management. In addition, it will consider and critique the available scoring systems utilised for risk stratification of this condition as well as offer insight into the research underpinning the relevant guidelines and to service provision across the NHS.

Definition

AUGIB can be defined anatomically as bleeding proximal to the ligament of Treitz, (image 1) to differentiate it from lower gastrointestinal bleeding involving the colon, and middle gastrointestinal bleeding involving the small intestine distal to the ligament of Treitz (Cappell 2008). AUGIB can be further sub-divided into variceal and non-variceal bleeding.

Variceal Bleeding and Non- Variceal Bleeding

Variceal bleeding is more often associated with liver cirrhosis due to increased portal pressures and accounted for eleven percent of all AUGIB admissions in 2007 and is on the increase in the United Kingdom (UK) (Kurien and Lobo 2015: NCEPOD 2015). Non-variceal bleeding has various causes, most commonly peptic ulcer disease (PUD), although this is on the decline in the UK due to decreased prevalence of helicobacter pylori and increased use of proton pump inhibitors (PPI), (Kurien and Lobo 2015). Other risk factors of PUD remain, including use of non-steroidal anti-inflammatories (NSAIDs) or aspirin and other anti-platelet medications, alcohol consumption and smoking (Cappell 2008: Rotondana 2014). Further causes of non-variceal AUGIB include Mallory Weiss tear, malignancy, vascular abnormalities and angiodysplasia (Cappell 2008: NCEPOD 2015).

Clinical assessment:

Clinical assessment of the patient, to include a detailed history, examination and initial laboratory results and ongoing observations are important to accurately assess the need for initial resuscitation, timely intervention, and prognostication (Cappell 2008). A thorough ABCDE approach to assessing the patient is advocated in emergency presentation (Stanley and Laine 2019). It is important to recognise that while many patients will present early with haematemesis due to the perceived urgency of the symptom, they can rapidly deteriorate (Stanley and Laine 2019). Haematemesis can vary in quantity and quality, from fresh blood to coffee grounds and patients may also present with melaena or haematochezia (Holster and Kuipers 2012). Observation of physiological parameters such as respiration rate, blood pressure, pulse rate, temperature can give vital early indication to the deteriorating patient (Holster and Kuipers 2012).

Scoring Tools

The NHS has adopted a verified and standardised tool called the National Early Warning Score (NEWS2), improving detection and response to clinical deterioration in adult patients and is a key element of patient safety and improving patient outcomes (NHS England, 2017). It has been reported in a study by Siau *et al* (2020) that a raised NEWS2 on admission is strongly correlated with poorer outcomes and an increased mortality risk.

NICE guidelines recommend the use of risk stratifying scores to plan care in AUGIB, namely the Glasgow Blatchford Score (GBS) on initial assessment, and the Rockall Score (RS) after endoscopy (NICE 2016). The BSG (2015) recommends the GBS and advises its use to aid clinical decision making for early intervention or discharge and includes it in the care bundle they produced.

Proper identification of high-risk patients can help identify appropriate candidates for early endoscopy or management in a higher-level care setting. Patients who are at low risk for these outcomes, can potentially be discharged safely, thereby allowing more efficient use of resources (Cheng *et al* 2012). The GBS (Figure 1) is based on simple clinical and laboratory parameters which are available soon after the patient presents. The study by Stanley *et al* (2011) found that the GBS was accurate in predicting both the need for urgent intervention and overall mortality in AUGIB. In 2012, BSG guidelines recommended that a GBS of zero could be used to identify very low risk patients who could avoid admission and be offered outpatient endoscopy. Working in acute and same day emergency care the lead author has been involved in discussion with senior clinicians to make discharge decisions utilising the GBS, referring patients to outpatient pathways that have scores of zero.

In contrast, the RS requires endoscopic results to predict mortality and is therefore not useful in planning treatments or discharge (Stanley *et al* 2011). Tang *et al* (2018) highlighted that the GBS was superior in emergency presentation due to its simplicity, lack of subjective parameters and rapid utilisation. Rockall *et al* (1996) said of their own model it should be used as an adjunct to clinical judgement in acute presentations and hoped that it would be used in the creation of treatment pathways and aid in the audit cycle and measuring performance in care standards. They also hypothesised that the RS would be able to, with further testing, be used to predict other risks of AUGIB such as rebleeding and the need for surgery, in part due to the inextricable link

with increased mortality. In 2013, Wang *et al*, undertook a retrospective analysis of cases and confirmed that the RS was indeed accurate in predicting rates of rebleeding and the need for surgical intervention in an elderly patient population.

Blood transfusion

There has been much debate in the literature and amongst clinicians for some time regarding the correct strategy for transfusion in AUGIB emergencies. In the patient that presents as haemodynamically stable there is of course time to make proper assessments and monitor blood loss and laboratory testing of the haemoglobin. The NICE guidance (2016) recommends appropriate use of blood products during resuscitation in the patient that presents with major haemorrhage. The guideline does however leave room for clinical judgment recognising that overuse of blood products may be as harmful as under use. A Cochrane database review by Jaraith *et al* (2010) found a limited number of studies examining the differences between a liberal and a restrictive transfusion strategy, with results favouring a restrictive transfusion policy. A small, randomised control study by Al-Jaghbeer and Yende (2013) found that a liberal transfusion policy was associated with higher mortality as well as higher incidence of complications such as rebleeding, repeat interventions, and cardiopulmonary adverse effects. An observational study by Restillini *et al* (2013) came to the same conclusions, hypothesising that the negative outcomes may be associated with rapid changes in circulating volume affecting cardiac output, clot rupture, coagulopathy, changes in stored red blood cells, and immunomodulation. A further study by Villanueva *et al* (2013) went a stage further and extrapolated from their results, confirming that a restrictive transfusion policy was associated with better patient outcomes, reduced the incidence of transfusion reactions and length of hospital stay, an outcome that is both favourable to patients but also cost effective. The BSG care bundle advocates transfusing patients with a haemoglobin (Hb) less than 70g/L with an aim for 70-100g/L, while NICE gives no figure to aim for. Local trust guidelines also suggest Hb of less than 70g/L, or 80g/L in patients with severe hypoxaemia or myocardial ischaemia, to consider transfusion in the patient that is compromised or unstable but

recommends a “less is more” approach, recognising that over transfusion may be harmful (KOHA 2020). It is the authors experience in practise that initial resuscitation with limited blood product use to stabilise the patient’s condition prior to endoscopy is utilised.

Pharmacological treatment

Medicinal interventions in the early resuscitation and ongoing care of patients can cause some controversy, with the risk benefit of each drug needing to be weighed up carefully. The use of pre-endoscopy PPI does not currently feature in UK guidelines as the evidence suggests that it may limit the diagnostic findings at endoscopy (Holster and Kuipers 2016) and does not reduce overall mortality (Sreedharan *et al* 2010). Kurien and Lobos (2015) point out that where endoscopy is delayed or not possible there may be a role for early PPI. This can be attributed to the action of PPI, which works quickly to neutralise gastric acid which has a stabilising effect on blot clots and in the longer term promotes mucosal healing (Holster and Kuipers 2012). Both the BSG and NICE guidelines recommend the use of PPI post endoscopy in patients with proven stigmata of recent haemorrhage on endoscopy, varying from intravenous or high dose oral regimens dependent on individual risk factors (Siau *et al* 2019: Sreedharan *et al* 2010).

The guidelines in the UK do not advocate the use of prokinetic medication prior to endoscopy despite reported reduction in the need for repeated intervention in patients that receive this therapy pre-endoscopy (Holster and Kuipers 2012). In patients undergoing very early endoscopy or those thought to have a high gastric burden of blood product it may be useful to use a prokinetic drug like erythromycin or metoclopramide to aide visualisation of the mucosa (Kurien and Lobos 2015), reducing the need for second procedures, use of blood products and length of hospital stay. The administration of drugs should not be a delay to definitive investigation/treatment with endoscopy (Siau *et al* 2019).

Endoscopy

Endoscopy is a valuable and indispensable tool for diagnosis and treatment of AUGIB. It allows for identification and diagnosis of the source of bleeding and the application of treatments to achieve haemostasis in a single session (Holster and Kuipers 2012). At one time there was much debate on timing of endoscopy in AUGIB, but today the BGS (2015) and NICE guidelines (2016) are both in agreement. Patients with a GBS score of one or less should be considered for outpatient management, and patients with a score of greater than one should be offered inpatient endoscopy within 24hours of presentation, relying on clinical judgement by a senior clinician that has assessed the patient. Where some debate still exists is in those patients with high risk factors, the clinically unstable patient and those with a GBS of greater than 12 (Alexandrino *et al* 2019). Bjorkman *et al* (2004) suggested that very early endoscopy leads to a higher probability of detecting high-risk lesions, warranting endoscopic intervention but without improved clinical results. A later study by Lim *et al* (2011) found that there was a lower mortality risk benefit in patients with a GBS of greater than 12, warranting very early endoscopy intervention.

The aim of therapeutic endoscopy is to stop active bleeding and reduce the risk of further bleeding (Holster and Kuipers 2012). It has become an invaluable tool as it allows identification and diagnosis, providing information for utilising tools such as the RS to facilitate prognostication and risk assess for rebleeding, whilst being able to apply treatments in the same session (Kurien and Lobo 2015). Endoscopy should be carried out by experience clinicians, in the urgent care setting as there is suggestion in the literature that in this scenario less skilled practitioners have higher complication and mortality rates (Tsoi *et al* 2009). It has been proven with standardisation and accreditation of training programs for endoscopists in the UK there has been an overall improvement in clinical outcomes, waiting lists and cost reductions (Siau *et al* 2018).

Pharmaceutical and mechanical interventions during endoscopy

Conventional treatments for non-variceal AUGIB include adrenaline injection, heater probes, and mechanical measures. It is recommended to treat bleeding PUD with combination therapy, using targeted adrenaline injections as an aid to gain haemostasis to further identify and treat the source with one of the other methods forementioned (Kurien and Lobo 2015). Adrenaline's action promotes haemostasis by

vasospasm and local tamponade and is short acting (Holster and Kuipers 2012). A Cochrane review (Vergara *et al* 2014) meta-analysis found that dual modal therapy had significantly better outcomes over adrenaline alone and now appears in all the guidelines discussed in this essay. Stanley *et al* 2019 commented that with advances in technologies and additions to the endoscopists "toolkit", including haemostatic sprays and powders, treatment options are continually increasing and require further studies to fully assess the advantages of these over the more traditional methods.

In 2007, a UK wide audit was undertaken to establish what service provision was available for AUGIB out of hours (Hearnshaw *et al* 2010), the results showed that just 52 percent of hospitals had a formal consultant led out of hours endoscopy service, and this was reportedly linked to lower rebleeding and mortality risks. The challenge the NHS faces is to provide equity of access and service provision, one that endoscopy professionals agree will improve patient safety and optimise care. That National Patient Safety Agency (NPSA) commissioned the BSG and the Royal College of Physicians to undertake a project to describe models of best practice in out of hours endoscopy. This resulted in a guidance document – Upper Gastrointestinal Bleeding Toolkit (2010), which outlined nine standards, including one which specifies that 'for patients who require more urgent intervention either for endoscopy, interventional radiology or surgery, formal 24/7 arrangements must be available'. In 2014, an up-to-date survey showed marginal improvements with 62 percent of hospitals now able to provide 24-hour endoscopy services (NHS improving quality 2014). The NCEPOD report (2015) recommends that hospitals that are unable to provide full out of hours services should have a robust network with neighbouring trusts that includes referrals and transfers, repatriation and adequate communication and information sharing to facilitate the same. The BSG (2015), NICE (2016) and NCEPOD (2015) are all in agreement that there should be a designated senior clinician, ideally a gastroenterologist, available 24 hours a day to discuss cases to aid risk stratification and care planning.

Post endoscopy treatment and care

Post endoscopy care will primarily be guided by the findings at endoscopy, but the Forrest classification can be utilised to assess risk of rebleeding and need for further intervention (Forrest *et al* 1974). Typically, it is this classification that is used to support

clinicians' decisions on when to restart anti-platelet and anticoagulation medications (Siau *et al* 2019). With the ever-increasing ageing population, and more complex mixed comorbidities the use of antiplatelet medications such as aspirin and clopidogrel are on the rise (Ahmed and Stanley 2012). Platelet disfunction is not limited to those on medication but can also be seen in the renal dialysis population and those that have had recent cardiac bypass surgery (Stanley and Laine 2019). Siau *et al* (2019) found that when aspirin was used as secondary prevention in cardiovascular disease and was discontinued on admission with AUGIB, there was up to a three-fold increased risk in cardiovascular events in the following 7-10 days. Whilst the risks of rebleeding and needing second look endoscopy were higher in patients that did not discontinue single antiplatelet therapy, the overall all-cause mortality was lower in this patient group, suggesting that therapy should be continued (Siau *et al* 2019: Ahmed and Stanley 2012). Where dual antiplatelet therapy is recommended, such as in the case of coronary artery drug-eluting stents, support should be sought from the Cardiology specialist as the risks of thrombosis, infarction and death in this patient group is greater than 40 percent (Kurien and Lobo 2015). This is reflected in both local and the NICE and BGS guidelines, but there remain some differences internationally, with United States (US) guidelines recommending platelet transfusions in patients on antiplatelet medications (Saiu *et al* 2019).

Warfarin and direct oral anticoagulants (DOAC) use is also increasingly prevalent in the population. Siau *et al* (2019) suggest that the interruption of warfarin is not detrimental due to the long-acting nature of the drug, but attention should be focused on correction of the international normalised ratio (INR) to below 2.5m to safely proceed with attempting to achieve haemostasis. Dependent on the reason for anticoagulation then reintroduction can be rapid or slow reloading once the patient's condition has stabilised (Ahmed and Stanley 2015). DOAC specific data remains limited, but the consensus is that due to their short half-life, time is the best antidote to a DOAC (Stanley and Laine 2019). Local policy (KOHA 2019) suggests discussion with haematology specialists to make a patient centred plan of care that may include use of blood products or prothrombin complex concentrate.

A short period of observation in high-risk patients with consideration of the need for second look endoscopy is recommended in all the guidelines discussed in this essay. Charatcharoenwitthaya *et al* (2011) report that factors such as pre-endoscopy blood

transfusion and high RS are accurate predictors of rebleeding and mortality and this should be factored into post endoscopy care and discharge planning. Local guidelines advocate that outpatient follow up should include clinical nurse specialist review as a minimum, with certain patient groups having repeat endoscopy (KOHA 2019).

Conclusion

The role of the advanced clinical practitioner (ACP) in specialist medicine in secondary care means that they may be exposed to patients either admitted directly with AUGIB, or it become a secondary presentation or complication of other treatments. Throughout the authors' careers as a registered general nurse and as a trainee and trained ACP, they have taken part in the care provision, assessment, and treatment of patients with AUGIB. It is important as the clinical practitioner assessing the patient to take a thorough history and perform competent clinical examinations within their scope of practise (HEE 2017). The skills acquired through studies and clinical supervision have proven essential in delivering care to this patient group.

The purpose of this review was to collate the current literature and guidelines together and provide a clearer understanding of the evidence and research that underpins them. National and International guidelines are largely in agreement on how to manage the patient presenting with AUGIB and present clear treatment pathways, including risk assessment scoring systems and appropriate and timely senior reviews. This optimise the patient experience and appropriate use of resources, whilst also providing benchmarks against which care provision can be audited and improved upon.

When evaluating the evidence base, the practitioner must also consider their own clinical experience, patient characteristics and preference when making clinical decisions regarding treatment and management of patients. As Nurses take on more advancing roles, it is vital that they underpin their work with relevant knowledge, and evidence this in their portfolio via continuing professional development.

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