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ADVANCES IN EMERGENCY TREATMENT FOR UPPER DIGESTIVE BLEEDINGS: A REVIEW OF RECENT DEVELOPMENTS

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Abstract: Goal: This study aims to analyze recent advances in the treatment of upper gastrointestinal bleeding (UDB) in emergency settings, focusing on efficacy, safety and impact on clinical outcomes. Methodology: A literature review was carried out in the PubMed database, using the terms "Upper gastrointestinal bleeding", "Emergency treatment", and "Advancements". After rigorous application of the inclusion and exclusion criteria, 1 were selected3articles published between 2019 and 2024. Review: The review highlighted the relevance of immediate endoscopic interventions and introduced innovative techniques such as the use of Hemospray and 'Over the Scope Clips' (OTSC) for effective control of bleeding. The importance of differentiating between variceal and non-variceal bleeding and of appropriately managing pre-endoscopic anticoagulation was highlighted. Conclusion: Advances in endoscopic and pharmacological techniques have significantly improved the treatment of UGIB. The necessity of agile and precise interventions, particularly in patients with multiple comorbidities, remains a significant challenge. The training and experience of healthcare professionals are crucial to improving clinical outcomes.
Keywords: High digestive bleeding, endoscopic treatment, emergency interventions.

INTRODUCTION

The UGIB, located above the ligament of Treitz, is recognized as one of the most complex and challenging medical emergencies, with manifestations ranging from acute and potentially lethal episodes to chronic forms of less obvious blood loss. Peptic ulcer disease is emerging as the most common cause of UGIB, despite significant advances in Helicobacter pylori eradication therapy and continued use of proton pump inhibitors. Although the incidence of UGIB is declining

due to improvements in pharmacological and endotherapeutic interventions, these cases still cause emergency presentations, with mortality rates ranging between 2% and 10% (Beggs et al., 2014).

The clinical variability of UGIB, influenced by the origin and intensity of bleeding, as well as the patient's comorbidities, represents a significant challenge for diagnosis and effective treatment. Endoscopy performed early, preferably within the first 24 hours after the onset of symptoms, is crucial to improving clinical outcomes. This practice not only serves for diagnosis but also plays a vital therapeutic role in the management of acute UGIB (Naseer et al., 2020).

The distinction between variceal and non-variceal bleeding is critical given that variceal bleeding is associated with increased mortality and requires a rapid approach that includes administration of antibiotics and vasopressors prior to endoscopic intervention (Orpen-Palmer and Stanley, 2022). Furthermore, management of UGIB extends beyond endoscopic interventions to include pharmacological therapies and, in some cases, surgical or radiological procedures to treat refractory bleeding.

The advances in endoscopic techniques and pharmacological options have been crucial in the management of UGIB, providing more effective bleeding control and accurate identification of bleeding sources. However, UGIB remains a serious clinical emergency, the complexity of which is exacerbated by the aging of the population, the increase in the use of antithrombotic medications, and the challenges inherent in treating patients with multiple comorbidities (Naseer et al., 2020).

In this context, the present literature review aims to analyze the most recent advances in the treatment of upper digestive hemorrhages in emergency scenarios, focusing on practices that optimize clinical results and the prevention of complications, in order to contribute to improving the quality of patients' lives.

METHODOLOGY

This study consists of a meticulously developed literature review using the PVO strategy, adapted to include: Population or research problem (upper gastrointestinal bleeding), Intervention (treatment in emergency situations), and Outcome (outcome, evaluating efficacy, safety and clinical results). The guiding research question was: "What are the most recent advances in the treatment of upper gastrointestinal bleeding in emergency situations, and how do these innovations impact efficacy, safety and clinical outcomes, as evidenced by contemporary scientific literature?"

To collect data, an extensive search was carried out in the PubMed - MEDLINE (Medical Literature Analysis and Retrieval System Online) database. The search strategy included the use of the terms "Upper gastrointestinal bleeding", "Emergency treatment", "Emergency management" and "Advancements", combined with the Boolean operators "AND" and "OR". This initial search resulted in the identification of 115 articles.

The defined inclusion criteria were: articles published between 2019 and 2024, which addressed topics relevant to the research question, including reviews, meta-analyses, observational studies and experimental studies, all available in full. The exclusion criteria applied were: publications available only in abstract form, and those that did not directly address the proposed question or that failed to meet the other inclusion criteria.

After rigorous application of the inclusion and exclusion criteria, the set of articles was reduced to 45. Of these, 13 articles were selected to form the basis of analysis for the present study, with the aim of deepening the

understanding of advances in emergency treatment for upper gastrointestinal bleeding, focusing on its efficacy, safety and impact on clinical results.

This methodology allowed for a comprehensive and updated review, essential to critically evaluate innovations in the treatment of upper gastrointestinal bleeding in emergency settings, facilitating the understanding of the practical implications of these advances in medical practice.

DISCUSSION

EMERGENCY ENDOSCOPIC INTERVENTIONS IN THE CONTROL OF UPPER GASTROINTESTINAL BLEEDING

Upper gastrointestinal bleeding (ADH) is a clinical condition with high prevalence and significant mortality, representing an important challenge for health systems globally. Due to the severity associated with UGIB, evidence-based medicine has constantly sought to refine and align emergency endoscopic interventions. As research advances, new techniques and devices have been developed to improve survival rates after episodes of gastrointestinal bleeding (Abe et al., 2021).

Upper gastrointestinal endoscopy is the procedure of choice for both the diagnosis and treatment of acute upper gastrointestinal hemorrhage. This method has established itself as fundamental in reducing mortality and rebleeding rates, allowing control of bleeding in high-risk injuries and reducing the need for subsequent surgical intervention. As described by Ejtehadi et al. (2021), endoscopic hemostatic treatment is effective in reducing further bleeding in such injuries. It is recommended that endoscopy be performed within 24 hours of the onset of symptoms in patients with acute upper gastrointestinal bleeding. However, studies indicate that performing urgent endoscopy — set at varying intervals from 2 to 12 hours after presentation — in unselected patients did not reduce mortality. This suggests the need to refine other aspects of clinical management in addition to focusing on the technical details of the intervention (Ejtehadi et al., 2021).

Ejtehadi et al. (2021) also emphasize that endoscopy must be performed immediately after resuscitation in situations of severe upper gastrointestinal bleeding. It is imperative that all patients with cirrhosis or a history of liver disease, especially those at risk for variceal bleeding, undergo an endoscopy within the first 12 hours of presentation. Furthermore, it is important to highlight that the two most common causes of upper gastrointestinal bleeding are peptic ulcers and variceal bleeding, which reinforces the need for guidelines that cover these underlying conditions.

The management of UGIB has been significantly transformed by the development of minimally invasive techniques and technologies. As pointed out by Shrestha et al. (2019), the evolution of surgery from open approaches to laparoscopic procedures has changed the landscape of surgical treatment, despite challenges such as longer operative time, a steep learning curve for surgeons. This study is based on a systematic review and meta-analysis of data from 60 patients who underwent surgical treatment to repair giant paraesophageal hernias with a biological prosthesis between 2010 and 2014 in an upper gastrointestinal unit of a large district hospital, with final clinical follow-up in mid 2017.

Furthermore, Cañamares-Orbís and Chan (2019) highlight that effective treatment of UGIB involves a series of critical steps, including the appropriate use of pre-endoscopic medications, determining the appropriate time to perform endoscopy,

choosing the endoscopic treatment and the selection of post-procedure medications. The authors noted that anticoagulation management before endoscopy did not increase mortality in patients with active bleeding.

The hemospray is an emerging technique that shows great potential in the treatment of upper gastrointestinal bleeding. This method involves the application of a powder based on an inert mineral, which is released through the endoscope directly at the source of bleeding, forming a mechanical hemostatic barrier. Hemospray is effective for both ulcers and bleeding tumors, including in cases of varicose upper digestive bleeding, and has low rebleeding rates (Awadalla, Desimone, Wassef, 2019).

Emerging treatments for UGIB include the use of 'Over the Scope Clips' (OTSC), endoscopic suturing and 'Coagrasper'. OTSC, in particular, offers a superior hemostatic method compared to injectable or thermal techniques, establishing itself as a first-line treatment for non-variceal upper gastrointestinal bleeding. Endoscopic suturing, on the other hand, also shows excellent results in controlling bleeding, especially in ulcers, with advantages over OTSC and Hemospray, although it must be avoided in malignant ulcers (Naseer, Lambert, Hamed, Ali, 2020).

Finally, 'Coagrasper', which combines thermal and mechanical mechanisms, is minimally invasive and has advantages over conventional methods, such as hemoclips. According to Naseer et al. (2020), due to its unique properties, 'Coagrasper' is considered one of the most effective and safe modalities for endoscopic hemostatic treatment.

Dieulafoy's Lesion, a rare condition characterized by the erosion of vessels in the mucosa of the gastrointestinal tract, is particularly challenging due to its tendency to cause profuse and intermittent hemorrhages, manifesting as melena and hematemesis. These hemorrhages can lead to hemodynamic instability if not treated appropriately. Alfonso-García et al. (2021) highlight that upper digestive endoscopy is the diagnostic and therapeutic method of choice for Dieulafoy's Lesion. However, they also point to a recurrence rate of 12.5-20% of cases. In situations where hemorrhage cannot be contained with conservative treatments, resection of the portion of the gastrointestinal tract with aberrant vessels is considered the last management option (Alfonso-Garcia et al., 2021).

A study carried out by Garrido et al. (2021) in a university hospital in Colombia compared the effectiveness of UGIB treatment using video capsule endoscopy and single or double balloon endoscopy. The results showed similar effectiveness between the techniques in the management of hemorrhage, with greater diagnostic agreement between the methods, especially in hemorrhages caused by inflammatory lesions of the gastrointestinal tract. This study reinforces that both approaches are effective and proven choices for the diagnosis and treatment of UGIB (Garrido et al., 2021).

The training and experience of healthcare professionals are also crucial in the effective management of HDA emergencies. Allo et al. (2024) show that the failure rate in the treatment of hemorrhages decreases significantly when conducted by endoscopists with extensive experience in emergencies. The study reveals that professionals who performed more than 51 urgent and emergency procedures present better results compared to those who performed up to 10 procedures. Therefore, in addition to educational preparation, practical experience in highly complex situations is essential for professionals to be truly able to act in cases of unstable or high-risk patients (Allo et al., 2024).

INNOVATIVE PHARMACOLOGICAL AND THERAPEUTIC APPROACHES FOR HEMODYNAMIC STABILIZATION AND CONTROL

Therapeutic approaches for hemodynamic stabilization and control of UGIB include several transfusion strategies. The restrictive strategy, which sets the post-transfusion hemoglobin target value between 7-9 g/dL, and the liberal strategy, which seeks a post-transfusion hemoglobin target of ≥10 g/dL, are widely discussed.

The restrictive strategy, in particular, has become standard of care in non-life-threatening cases of UGIB and is endorsed by all major guidelines. For patients with underlying cardiovascular disease, however, a more liberal transfusion approach may be indicated, as a meta-analysis involving 11 studies outside the context of UGIB suggested a lower risk of cardiovascular events for the liberal treatment group, despite not there are significant differences in relation to mortality (Orpen-Palmer; Stanley, 2022).

Alali and Barkun (2023) highlight that platelet transfusion is not recommended in the absence of thrombocytopenia (platelet count <100,000/μL), since its use may be associated with increased mortality and has not demonstrated benefit in reducing additional hemorrhages. Antithrombotic management in the setting of UGIB is also a crucial concern. An international study revealed that 45% of 568 patients evaluated with UGIB were using these medications (Orpen-Palmer; Stanley, 2022). Suspension of these antithrombotic agents implies risks of thrombotic events, requiring a careful assessment of the need and duration of interruption.

Specifically, for the use of antiplatelet agents such as aspirin, discontinuation in cases of primary cardiovascular prevention is recommended, but must be maintained in secondary prevention scenarios. A meta-analysis that included 50,279 patients showed that those who stopped taking aspirin for secondary cardiovascular prevention had a three-fold increased risk of major cardiac events. This risk increased 89-fold in patients with stents. Furthermore, a randomized clinical trial involving 156 patients showed that although there was an increased risk of recurrent bleeding in the group that continued aspirin, 30-day mortality was significantly higher among those who discontinued the medication (Orpen-Palmer; Stanley, 2022).

In the case of patients with UGIB using anticoagulants such as warfarin, European and North American guidelines recommend the suspension and reversal of the anticoagulant in situations of severe UGIB, while for less severe cases, the decision must be individualized, weighing the pros and cons of withdrawal of the anticoagulant agent. Finally, erythromycin, evaluated for its prokinetic properties in the pre-endoscopic context, demonstrated significant benefits for visualization of the gastric mucosa, reduced need for secondary endoscopy and decreased hospital stay, according to results of a meta-analysis of randomized studies controlled (Alali and Barkun, 2023).

FINAL CONSIDERATIONS

This study provides a review of recent advances in the management of UGIB in emergencies, highlighting the importance of rapid interventions to optimize clinical outcomes. Endoscopy within the first 24 hours is vital for diagnosis and treatment, reducing mortality and subsequent surgeries. New technologies such as Hemospray and 'Over the Scope Clips' (OTSC) show effectiveness in controlling non-variceal hemorrhages. However, the management of variceal bleeding requires an integrated approach, with the use of vasopressors and antibiotics. Advances in pharmacological strategies are

essential in the management of anticoagulants, with critical decisions about continuation or discontinuation based on the balance between thrombotic and bleeding risks. The endoscopist's experience significantly improves the effectiveness of treatment, highlighting the need for specialized training. Although progress has been made, challenges remain, especially for patients with multiple comorbidities. Future research must focus on developing new technologies and therapeutic methods to continue improving clinical practices and improving patients' quality of life.

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