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Digestive Hemorrhages at the Bogodogo University Hospital Center: Patient Therapeutic Pathway and Interest of the Rockall Clinical scores and the Oakland score in their Management

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ABSTRACT

Introduction: *Gastrointestinal bleeding constitutes a life-threatening medical-surgical emergency that requires prompt recognition, assessment, and management.*

Objectives: *To study the management pathway of patients presenting with gastrointestinal bleeding and to determine the impact of clinical scoring systems on their care at the Medical Emergency Department of the Bogodogo University Hospital (CHU).*

Materials and Methods: *This was a descriptive cross-sectional study involving retrospective data collection over a two-year period, from July 2021 to July 2023. It was an exhaustive study, including all patients admitted for gastrointestinal bleeding during the study period who had complete medical records. The Rockall and Oakland scores were calculated to assess patient severity. The management pathway was considered "normal" if the patient received emergency care and follow-up, and "abnormal" if the patient was discharged without receiving care.*

Results: *Fifty-five (55) cases of gastrointestinal bleeding were included in the study: 42 (76.4%) were upper gastrointestinal bleeds and 13 (23.6%) were lower gastrointestinal bleeds. The 30–50 age group was the most represented (50.9% of cases), with a male predominance of 67.3%. Hematemesis and rectorrhagia were the most frequent reasons for consultation, accounting for 56.4% and 23.6% of cases, respectively. Based on the Rockall scores, 64.3% (27/42) of patients had a favorable prognosis, while 9.5% (9/42) were at high risk of death. Based on the Oakland score, 30.8% (4/13) of patients were at low risk for complications, while 69.2% (9/13) were at high risk. Upper and lower gastrointestinal endoscopy identified gastroduodenal ulcers, esophageal varices, and hemorrhoids as the most frequent etiologies, accounting for 25.5%, 12.7%, and 11% of cases, respectively. Only one patient underwent endoscopic hemostasis. The clinical management pathway was standard for 89.1% of patients.*

Conclusion: *Using clinical scores to monitor patients admitted for gastrointestinal bleeding could help streamline patient management. Interventional endoscopy remains underutilized in our setting, even though it could further improve the management of complications and significantly reduce mortality.*

Keywords
Upper and lower gastrointestinal bleeding, Clinical management pathway, Interventional endoscopy, CHU-Bogodogo, Burkina Faso.

Introduction
Gastrointestinal hemorrhage refers to bleeding from the digestive tract. It is classified into upper gastrointestinal hemorrhages, which are the most common, and lower gastrointestinal hemorrhages. The hospital prevalence in Ouagadougou was estimated at 2.1% of all gastrointestinal disorders requiring hospitalization. Among 96 documented cases of gastrointestinal hemorrhage, upper hemorrhages accounted for 88.5%, lower hemorrhages for 6.25%, and a combination of both for 5.25% [1].

They constitute a medical-surgical emergency that often poses a life-threatening risk in our context, as illustrated by the mortality rates reported in Burkina Faso: 8.5% by Ouédraogo et al., 17% by Sombié et al., and 21.43% by Nikiéma et al.. The Rockall and Oakland scores are validated tools used to assess risk and guide the management of gastrointestinal bleeding; however, their calculation must not delay the resuscitation of an unstable patient. The Rockall score, used primarily for upper gastrointestinal bleeding (manifesting as hematemesis or melena), estimates the risk of rebleeding and mortality. It consists of a pre-endoscopic score followed by a complete score that integrates endoscopic findings. Although a low score suggests a lower risk, it does not replace clinical judgment. Conversely, the Oakland score is utilized for lower gastrointestinal bleeding (manifesting as hematochezia) to estimate the probability of a safe discharge for outpatient follow-up versus the need for hospitalization. Ultimately, these scoring systems facilitate the appropriate triage of emergency patients requiring blood transfusion or therapeutic endoscopy, thereby helping to reduce mortality [5-7].

Diagnostic and therapeutic digestive endoscopy has reduced mortality from gastrointestinal bleeding in high-risk patients in Western countries [8,9]. But in Sub-Saharan Africa, many studies reveal a low use of endoscopy in the management of digestive hemorrhage [5,10]. A study in Burkina in 2015 showed a lack of recourse to therapeutic endoscopy and found a mortality related to digestive hemorrhage of 17% [5]. In 2026, in the city of Ouagadougou, out of 3 public hospitals, only the one in Bogodogo is not equipped with therapeutic endoscopy equipment. In the other two hospitals, accessibility to procedures remains limited due to the limited number of practitioners capable of performing these procedures and the high cost of services.

The purpose of this study was to study the therapeutic pathway of patients with digestive hemorrhages and determine the impact of Rockall and Oakland clinical scores in the management of digestive hemorrhages at Bogodogo University Hospital.

Patients and Methods
This was a cross-sectional descriptive study with retrospective data collection over the period from January 1, 2021 to December 31, 2021. It took place at the Bogodogo University Hospital Center. All patients admitted to the emergency department for externalized gastrointestinal haemorrhage in the form of hematemesis and/or melaena and/or rectal bleeding or not externalized (acute **anemia**) were included. Patients with incomplete clinical information were excluded from the study (Figure 1).

Data collection was carried out using an individual and anonymous electronic form that identified the following variables: age, sex, occupation, time to emergency room after the first episode of bleeding, reasons for admission, the patient's pathological history, functional signs at admission, general signs, constants (temperature, pulse, respiratory rate, peripheral oxygen saturation, heart rate, weight, height), physical signs, biological and endoscopic data, the therapeutic data and evolution.

Operational definitions: the signs of hemodynamic shock were defined by a systolic blood pressure lower than 100 mmHg associated with a heart rate higher than 100 beats per minute. Severe anaemia corresponded to a haemoglobin level below 7 g/dL. A complete Rockall score of 0 = very low risk of recurrence and death, 1-2 = low risk, 3-4 = intermediate risk, 5-6 = high risk, ≥ 7 = very high risk of mortality [6]. An Oackland score less than or equal to 8 indicates a risk of adverse events, an outpatient follow-up may be considered; 9-10 = intermediate risk, individualized decision; > 10 = increased risk, hospitalization generally to be considered [7].

The data was analyzed by the software Epi info in its French version 7.2.6.0. The descriptive analysis was done for qualitative variables with absolute and relative frequencies. For quantitative variables, the mean with standard deviation was used. The study was approved by the institutional ethics committee of CHU-B. The data were collected anonymously and confidentially.

Results
A total of 59 patients were admitted for gastrointestinal bleeding out of the 3,351 patients referred during the study period, representing a hospital prevalence of 1.8%. Figure 1 illustrates the flow diagram of patients received in medical emergencies during the study period.

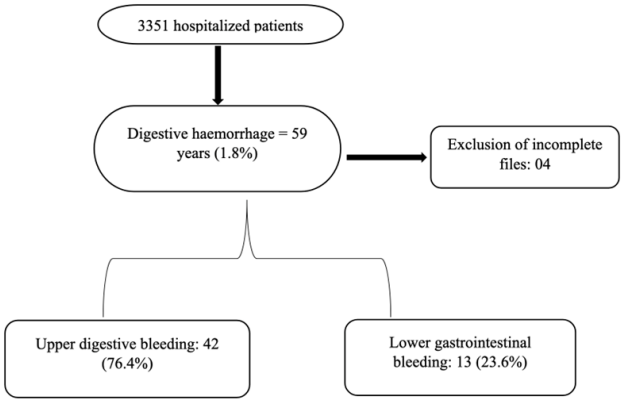


Figure 1: Flow diagram of patients received in medical emergencies during the study period.

Our analysis included 55 patients with a mean age of 45.4 ± 15.2 years (range: 18–81 years). A male predominance was observed, accounting for 67.3% of the cohort. Private-sector employees were the most represented subgroup, comprising 30.9% of cases. A history of epigastralgia was reported by 17 patients (31%). Regarding the time from symptom onset to emergency department admission, 28 patients (50.9%) were admitted within 24 hours, while 14 (25.5%) were admitted between 24 and 72 hours. Hematemesis was the most common reason for admission (31 cases, 56.4%), followed by hematochezia (13 cases, 23.6%)."

The associated symptoms were dominated by clinical signs of anemia, including pallor in 49 patients (89.1%), while epigastralgia was reported in 42 patients (76.4%).

The socioeconomic, clinical and biological characteristics of patients are illustrated in Table 1.

The risk of death or occurrence of adverse events in patients was assessed according to the clinical Rockall score and the Oackland score. Of the 42 patients (76.36%) with upper gastrointestinal

Table 1: Socio-demographic, clinical and biological characteristics of patients (N=55).

Socio-Demographic Characteristics	Staff (N)	Percent (%)
Gender		
Men	37	67,3
Women	18	32,7
Age		
[18 – 30]	8	14,5
[30 – 50]	28	50,9
[50 – 70]	14	25,5
[70 – 90]	5	9,1
Occupation		
Salarie from the private sector	17	30,9
Housewives	13	23,7
Growers	6	10,9
Pensions	6	10,9
Pupils/students	2	3,6
Official	1	1,8
Unspecified	10	18,2
Medical history (A patient could have several medical histories and lifestyles)		
Epigastralgia	17	31
HTA	8	14,5
Diabetes	7	12,7
MUGD	5	9,1
Hemorrhoidal disease	4	7,3
Haematemesis	4	7,3
Melena	2	3,6
Rectorragie	2	3,6
Viral hepatitis B	1	1,8
Hepatocellular carcinoma	1	1,8
Lifestyles		
Alcohol	9	16,4
Tobacco	6	10,9
Phytotherapy	5	9,1
NSAIDs	2	3,6
reasons for hospitalization		
Haematemesis	31	56,4
Rectorragie	13	23,6
Haematemesis + melena	5	9,1
Melena	6	10,9
Functional signs*		
Sign of anemia intolerance	35	63,6
Epigastralgia	29	52,7
Diffuse abdominal pain	14	25,5
Pain in the right hypochondrium	3	5,5

General signs*		
Paleness	49	89,1
Shock state	37	67,3
Tachycardia	36	65,5
Polypnea	19	34,5
Altered consciousness	5	9,1
Icterus	3	5,5
IMO	4	7,3
Desaturation	2	3,6
Physical signs*		
Induced epigastric pain	42	76,4
Pain in the right hypochondrium	5	9,1
Hepatomegaly	7	12,7
PH syndrome	5	9,1
Mass at TR	1	1,8
Biology		
Severe anemia (Hb < 7g)	35	63,6
Moderate anaemia (7g-9g)	14	25,5
Mild anemia (>9g)	6	10,9
High blood sugar	9	16,4
High serum creatinine	14	25,5
Hepatitis B	7	12,7
Hepatitis C	4	7,3
Positive total anti-HBc activity	4	7,3

*A patient could present several signs at once.

bleeding, 4 were at risk of death by Rockall score (Table 2).

Table 2: Distribution of patients with upper gastrointestinal bleeding according to the Rockall score.

Rockall's score	Staffing (n)	Percent (%)
<3: Low and very low risk	27	64,29
3-4 Moderate risk	11	26,19
5-7 High Risk	2	4,76
8-11 Very high risk	2	4,76
Total	**42**	**100**

Of the 13 patients with low gastrointestinal hemorrhage, according to the Oakland score, 9 (69.2%) had a low risk of complications (score ≤ 8) and 4 (30.8%) had a high risk of major bleeding (score ≥ 8).

The digestive endoscopy was carried out in different time frames for the patients. It was 24 hours for 4 patients (7.3%), 48-72h for 25 patients (45.4%) and more than 72h for 26 patients (47.3%). The results of digestive endoscopy were dominated by peptic ulcers (36%), followed by gastropathies and esophagitis (24%).

Table 3 shows the lesions identified during upper and lower endoscopy.

The clinical pathway was as follows: among the 55 patients admitted for gastrointestinal hemorrhage, 46 (83.6%) followed the standard care pathway. Consequently, these patients underwent emergency severity assessment, laboratory testing (including a complete blood count [CBC] and blood typing), and emergency blood transfusion within 24 to 48 hours for those with hemoglobin levels below 7 g/dL. They were subsequently transferred to the internal medicine department.

Table 3: Endoscopic lesions on upper and lower digestive endoscopy.

Endoscopic lesions	Staffing (n)	Percent (%)
Upper digestive endoscopy*		
Oesophagitis	10	24
Gastric erosion	8	19
Esophageal varice	5	12
Peptic ulcer	15	36
Gastropathie	10	24
Gastric varices	1	2
Esophageal tumor	1	2
Hiatal hernia	8	19
Mycosis	2	5
Lower digestive endoscopy*		
Hemorrhoids	7	54
Diverticula	2	15
Rectal erosion	1	8
Traces of blood without injury	1	8

*A patient could have several endoscopic lesions.

Once hospitalized, patients underwent gastrointestinal endoscopy within 72 hours (47.3%) if it had not already been performed, and were discharged following stabilization and treatment of the underlying cause of bleeding, when identified. Furthermore, six patients (10.9%) experienced an atypical clinical course: one

patient was discharged against medical advice, and five patients absconded during monitoring—prior to undergoing endoscopy—while awaiting additional blood transfusions. Figures 1 and 2 illustrate the planned clinical pathway versus the one actually followed by our patients.

Initial management consisted of fluid resuscitation using crystalloids and/or colloids. A total of 38 patients (69.1%) received blood transfusions. Proton pump inhibitor (PPI) therapy was administered to 50 patients (90.9%), while analgesics were prescribed in 26 cases (47.3%). No patient required vasopressor support. One patient (1.8%) underwent endoscopic therapy via esophageal variceal ligation. Regarding clinical outcomes, five patients died during hospitalization. The length of hospital stay was less than 72 hours for 15 patients (27.3%) and exceeded 72 hours for 40 patients (72.7%).

Discussion

The mean age of our patients was 45.4 years, which is consistent with the higher occurrence of gastrointestinal hemorrhage among younger populations in sub-Saharan Africa [5,11–13]. In contrast, Western cohorts typically present with this condition after the age of 60. A male predominance has similarly been reported in several other studies on gastrointestinal bleeding. This disparity could be explained by a greater exposure of young African men to gastrotoxic substances, such as alcohol and tobacco, alongside a frequent reliance on self-medication, including herbal medicine and NSAIDs.

Admission within 24 hours of symptom onset was observed in half of our patients. This early hospitalization is directly linked to the clinical presentation of the gastrointestinal hemorrhage, which was dominated by hematemesis and clinical signs of severe anemia. The dramatic and alarming nature of hematemesis typically prompts patients and their families to seek immediate medical attention.

Nevertheless, some patients presented late (defined as more than 24 hours after onset), which significantly worsens the prognosis and increases mortality risk. In our cohort, delayed admission was primarily associated with lower gastrointestinal bleeding presenting as hematochezia. The primary cause for this delay was the time lost during patient transfer from peripheral health facilities to the emergency department of the referral center (CHU Bogodogo).

The high percentage of patients who followed a standard clinical pathway could be attributed to significant improvements in the management of gastrointestinal hemorrhage within the emergency department at CHU-B. Indeed, continuous communication is maintained between hepatogastroenterologists and emergency physicians to ensure optimal triage and care for these acute cases. In contrast, six patients (10.9%) experienced an atypical clinical course that warrants closer examination. These individuals left the hospital prior to undergoing gastrointestinal endoscopy, thereby preventing an etiological investigation of their bleeding. Since University Teaching Hospitals represent the tertiary level of the healthcare pyramid, establishing a baseline standard of care, including the definitive identification of the bleeding source, is

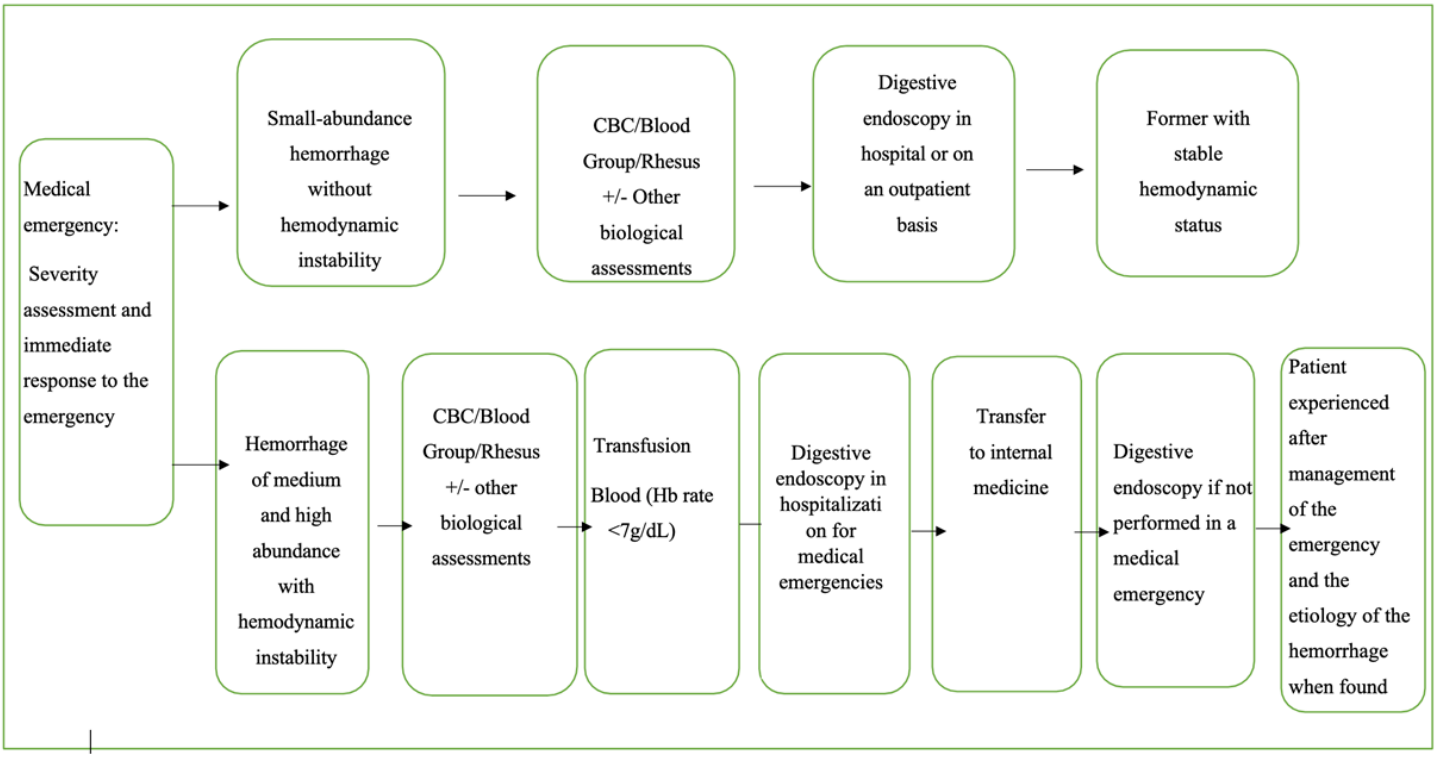


Figure 1: Standard therapeutic circuit planned for any patient coming for digestive hemorrhage at CHU Bogodogo.

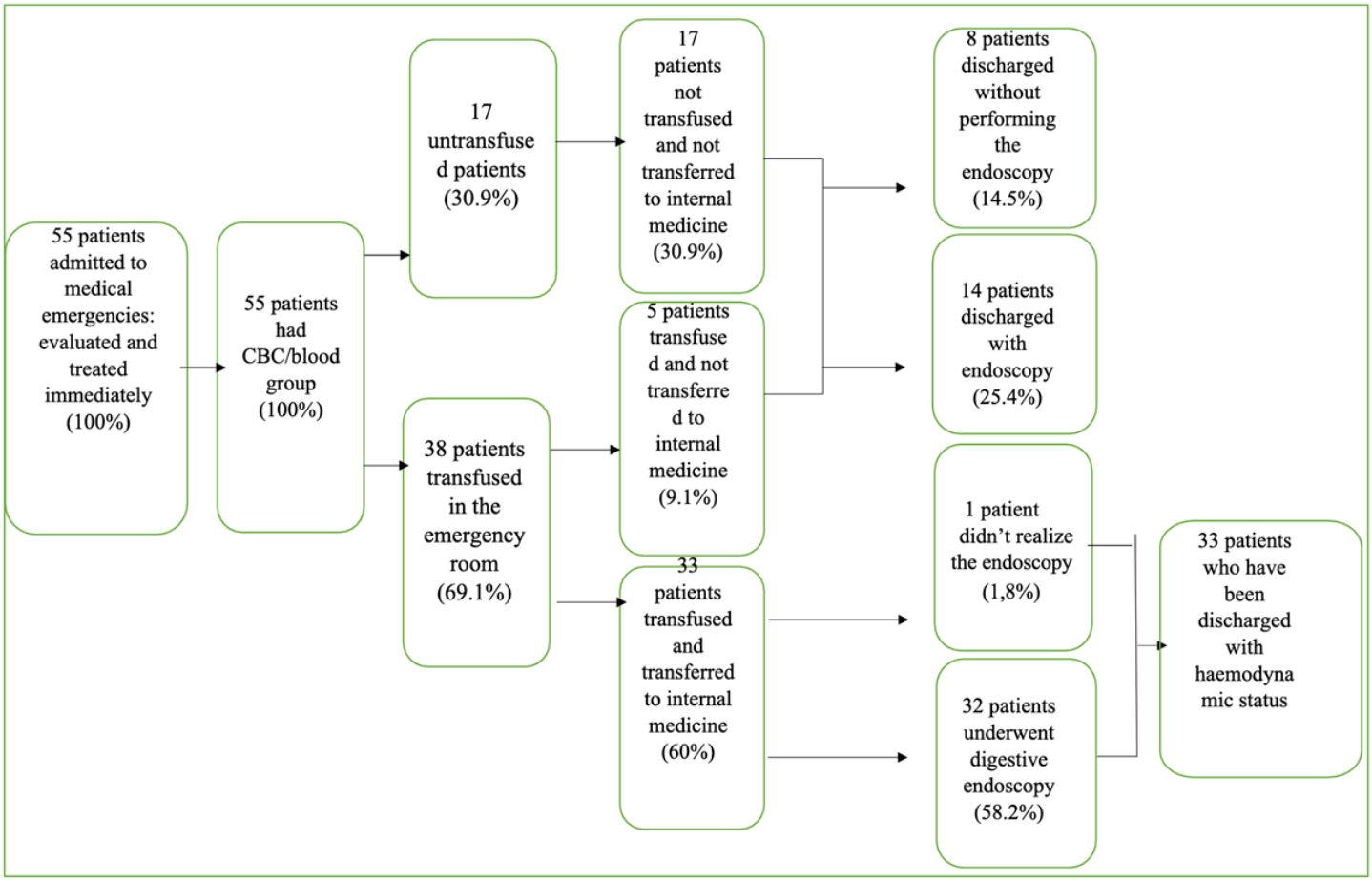


Figure 2: Therapeutic pathway of the patients in our study who came for haemorrhagic.

imperative. Consequently, every patient admitted to the emergency department with gastrointestinal bleeding should have timely access to these diagnostic interventions.

On admission, the majority of our patients (n = 27, 64.3%) had a favorable prognosis, defined as a Rockall score lower than 3, which aligns with the findings reported by Tham et al.. In contrast, according to the Rockall score, four patients (9.5%) were identified as being at high risk of mortality. However, the initial management of these acute patients must not be delayed by score calculations and should be initiated immediately.

Another study conducted in Ouagadougou by Sombié et al. [5] found that, among 265 patients, the clinical and complete Rockall scores ranged from 0 to 6 and 0 to 9, respectively. Their mean clinical Rockall score was 2.0 ± 0.1 and the complete score was 3.2 ± 0.1, with 101 patients (38.1%) presenting a complete score ≤ 2. In our series, 11 patients (26.2%) had a Rockall score between 3 and 4, placing them in a moderate-risk category that requires close monitoring. Furthermore, Sombié et al. demonstrated that a high clinical score (> 0) and complete score (> 2) were significantly associated with blood transfusion requirements ($p < 0.0001$; respective Odds Ratios [OR]: 5.7; 95% CI: 3.1–10.8 and 5.4; 95% CI: 3.2–9.3). Hemorrhagic recurrence was noted in 45 cases (11.7%) in their study. In multivariate analysis, the predictive factors for rebleeding were male sex (OR: 3.1; 95% CI: 1.1–9.2; $p = 0.032$), hemoglobin levels below 10 g/dL at admission (OR: 6.2; 95% CI: 1.4–26.9; $p = 0.006$), and a complete Rockall score greater than 2 (OR: 2.8; 95% CI: 1.1–7.2; $p = 0.022$) [5].

More than two-thirds (69.2%) of patients admitted for lower gastrointestinal bleeding had an Oakland score less than or equal to 8. These patients were considered to have experienced minor bleeding and to be at low risk of complications [7].

The time required for endoscopy was greater than 48 hours in 92.8% of cases. We find this delay in most studies in sub-Saharan Africa [3,14,15]. This timeframe does not meet international recommendations [8,9,16] and will reduce the cost-effectiveness of endoscopic examinations [9]. To date, only medical care is possible in emergency 24/24 hours in hospitals in the city of Ouagadougou, as endoscopy units do not offer services in the afternoons and nights, which significantly limits the quality of care.

Lesions identified on upper gastrointestinal endoscopy were dominated by peptic ulcers, esophagitis, and gastropathies, which is consistent with conventional findings reported for non-variceal upper gastrointestinal bleeding [14,17–19]. Esophageal varices

accounted for 12% of these lesions. Conversely, hemorrhoids comprised the majority (54%) of findings on lower endoscopy. This outcome differs from the study by Amani et al., who reported a predominance of colorectal cancers. This discrepancy is likely attributable to the type of examination performed, which was dominated by anoscopy and sigmoidoscopy in our study.

In the absence of therapeutic endoscopy, clinical management relies heavily on medical therapy. In our cohort, proton pump inhibitors and blood transfusions were administered to 50 (90.9%) and 38 (69.1%) patients, respectively, in accordance with international guidelines.

Because access to interventional endoscopy remains severely restricted, medical management is the most widely utilized approach across many sub-Saharan African nations. Notably, no patient received vasoactive therapy due to either cost-related barriers, product unavailability, or both within our healthcare context.

The mortality rate in our study was 9.1%, which is close to that of several studies on digestive hemorrhages in countries where therapeutic endoscopy is practiced [9,2,17,19]. For other African authors, this rate ranged from 22 to 36% [11,3,21]. This difference could be explained by the fact that the majority of our patients were young, had few comorbidities and were admitted early to a hospital.

Our study has limitations and constraints such as its retrospective nature and the presence of missing data in the files. Indeed, the endoscopy was not performed by several patients for various reasons.

Conclusion

The management of gastrointestinal bleeding remains mainly medicinal in our context, despite advances in endoscopic management. Despite a mortality comparable to European studies, the organization of endoscopy services and the acquisition of therapeutic endoscopy equipment would allow better patient care with a reduction in morbidity and mortality.

References

1. Marion Y, Lebreton G, Le Pennec V, et al. The management of lower gastrointestinal bleeding. J Visc Surg. 2014; 151: 191-201.
2. Hearnshaw SA, Logan RFA, Lowe D, et al. Acute upper gastrointestinal bleeding in the UK: patient characteristics, diagnoses and outcomes in the 2007 UK audit. Gut. 2011; 60: 1327-35.
3. Ngami RS, Mikolele Ahoui Apendi PC, Moulene P, et al. Risk factors for mortality from upper digestive hemorrhage at the Brazzaville hospital. Mali Med. 2026; 36: 27-30.
4. Tham T, James C, Kelly M. Predicting outcome of acute non-variceal upper gastrointestinal haemorrhage without endoscopy using the clinical Rockall Score. Postgrad Med J. 2006; 82: 757-759.
5. Sombié R, Tiendrébéogo A, Guingané A, et al. Upper digestive hemorrhage: epidemiological aspects and prognostic factors in Burkina Faso (West Africa). J Afr Hepato-Gastroenterology. 2015; 9: 154-159.
6. Imperiale TF, Dominitz JA, Provenzale DT, et al. Predicting Poor Outcome From Acute Upper Gastrointestinal Hemorrhage. Arch Intern Med. 2007; 167.
7. Oakland K, Chadwick G, East JE, et al. Diagnosis and management of acute lower gastrointestinal bleeding: guidelines from the British Society of Gastroenterology. Gut. 2019; 68: 776-89.
8. Adler DG, Leighton JA, Davila RE, David Hambrick R, et al. ASGE guideline: the role of endoscopy in acute non-variceal upper-GI hemorrhage. Gastrointest Endosc. 2004; 60: 497-504.
9. Kohn A, Ancona C, Belleudi V, et al. The impact of endoscopy and specialist care on 30-day mortality among patients with acute non-variceal upper gastrointestinal hemorrhage: An Italian population-based study. Dig Liver Dis. 2010; 42: 629-634.
10. Diakité M, Toth'o A, Assi C, et al. Epidemiology and prognostic factors of upper digestive hemorrhage in Côte d'Ivoire: a prospective multicenter observational study. J Afr Hepato-Gastroenterology. 2016; 10: 80-84.
11. Diarra M, Soucko-Diarra A, Dolo M, et al. Upper acute digestive hemorrhages: Experience in a rural setting. Acta Endosc. 2007; 37: 321-326.
12. Rakotovao M, Fanantenantsoa R, Rasamoelina N, et al. Epidemic-clinical and therapeutic aspects of digestive hemorrhages seen at the Tambohobe Fianarantsoa University Hospital. Rev Medical Madag. 2016; 6.
13. Kamenge, Amani M, Nizigama J, et al. Epidemiological aspects and causes of low-level digestive bleeding at the Kamenge University Hospital in Burundi. J Afr Cas Clin Rev. 2025; 9: 147-151.
14. Okon AJB, Thot'o AS, Diakité M, et al. Results and predictive factors of mortality from gastrointestinal bleeding during hospitalization: multicenter study in Côte-d'Ivoire. Acta Endosc. 2015; 45: 285-290.
15. Zohoun PI, Sosso PM, Akpona PSA, et al. Reading committee (REFEREES). 2023.
16. Barkun AN, Bardou M, Kuipers EJ, et al. International Consensus Recommendations on the Management of Patients with Nonvariceal Upper Gastrointestinal Bleeding. Ann Intern Med. 2010; 152: 101-113.
17. Ben Chaabane N, Ben Youssef H, Ghedira A, et al. Epidemiology of upper digestive hemorrhages in Tunisia. Acta Endosc. 2010; 40: 176-182.
18. British Society of Gastroenterology Endoscopy Committee. Non-variceal upper gastrointestinal haemorrhage: guidelines. Gut. 2002; 51: iv1-6.

19. Van Leerdam ME. Epidemiology of acute upper gastrointestinal bleeding. Best Pract Res Clin Gastroenterol. 2008; 22: 209-224.

20. Gralnek I, Dumonceau JM, Kuipers E, et al. Diagnosis and management of nonvariceal upper gastrointestinal hemorrhage: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. Endoscopy. 2015; 47: a1-46.

21. Sangaré D, Sanogo A, Diarra A, et al. Epidemiological and prognostic aspects of upper digestive hemorrhages at the Nianankoro Fomba (HfN) hospital in Segou. Mali Med. 2022; 37: 53-55.

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