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Therapeutic Profile and Prognostic Factors of Patients Suffering from Upper Digestive Bleeding at Sikasso Regional Hospital

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Abstract

Introduction: Upper digestive hemorrhage is one of the main digestive emergencies and remains a major cause of morbidity and mortality in Mali. The aim of this study was to describe the therapeutic profile and outcome of patients suffering from upper digestive haemorrhage. **Methodology:** This was a prospective study carried out in the internal medicine department of the Sikasso Regional Hospital from August 2022 to July 2023. All adult patients presenting with upper digestive haemorrhage and having given their consent, were included. Data were analyzed using SPSS version 21 software. **Results:** Sixty-three patients were enrolled. The mean age was 49.7 ± 18.99 years, with a male-female sex ratio of 2.2. Ruptured esophageal varices (37.5%) and peptic ulcer (25%) were the main etiologies. Pharmacological treatment was dominated by proton pump inhibitors (85.7%). Hemostasis endoscopy accounted for 3.17%. The evolution was marked by hemorrhagic arrest (69.84%), recurrence of hemorrhage (11.11%) and death (19.04%), the main cause of which was hemorrhagic shock (58.3%). We found no statistically significant relationship between prognosis and etiologies (P = 0.11), and length of hospital stay

(P = 0.18). **Conclusion:** Hemostasis endoscopy remains a challenge for Sikasso Hospital. A holistic strategy of communication and community awareness-raising, combined with adequate technical facilities, will help to improve patient care and outcomes.

Keywords

Digestive Hemorrhage, Digestive Endoscopy, Treatment, Outcome

1. Introduction

Upper digestive hemorrhage (UDH) is defined as any bleeding from the mouth following efforts to vomit (hematemesis) or from the anus (melena) whose lesion is located upstream of the angle of TREIZE. UDH in adults is one of the main digestive emergencies, and remains a major cause of morbidity and mortality. Its annual incidence is estimated at between 40 and 150 cases per 100,000 inhabitants per year. [1] [2]. The most frequent etiology of upper digestive bleeding is peptic ulcer, accounting for around 36% [3]. Despite advances in medical, endoscopic and intensive care management over the last 20 years, the mortality rate remains high, at around 5% - 10% [4]. Deaths linked to upper digestive haemorrhage are often favoured by the decompensation of a pre-existing pathology, particularly in elderly subjects [5].

In Africa, reported hospital frequencies vary from country to country. They were estimated at 7.3% in Togo in 2012, 5.3% in Tunisia in 2010, 3.6% in Morocco in 2009, 3.1% in Madagascar in a study conducted between 2007 and 2009, and 1.2% in Burkina Faso in a study published in 2015 [6] [7].

In Mali, the hospital incidence of upper digestive haemorrhage was estimated at 6.7% in a study carried out in 2018 at the Centre hospitalier universitaire (CHU) Gabriel Touré [8].

In the region, very little statistical data on upper digestive hemorrhage has been published.

The aim of the present study was to describe the therapeutic profile and prognostic factors of patients admitted to the internal medicine department of the Sikasso regional hospital for upper digestive haemorrhage.

2. Methodology

Type of study: this was a prospective analytical study aimed at describing the therapeutic profile and prognostic factors of patients suffering from upper digestive haemorrhage.

Study site and period: the internal medicine department of the Sikasso Regional Hospital, which served as the study site, had only 9 staff, including 2 hepato-gastroenterologists.

Regional hospitals are the 2nd level of patient referral in Mali's health pyramid. The study ran from August 1, 2022 to July 31, 2023.

Population: the source population consisted of adult subjects admitted to the Sikasso Regional Hospital. The target population consisted of adult patients admitted to the internal medicine department of the Sikasso hospital for upper digestive bleeding.

Inclusion and non-inclusion criteria: all patients at least 18 years of age with confirmed upper digestive bleeding who had given verbal consent to participate in the study were included. Patients with lower digestive haemorrhage, those with uninvestigated upper digestive haemorrhage, patients with ENT haemorrhage and subjects who did not give verbal consent to participate were excluded from the study.

Sampling: the simple random sampling method was used, and the sample size was calculated according to the following formula:

$$n = (Z\alpha)^2 \frac{PQ}{I^2} = \frac{1.96^2 \cdot 0.039x(1-0.039)}{0.05^2} = 58$$

n: desired sample size;

Zα: Z = 1.96 for α = 95% in the Z-score table;

p: prevalence of the event of interest = 3.9;

$$Q = 1 - p$$

I: degree of precision = 5%.

To increase the power of the study, we added 5% of the sample size calculated to have a representative workforce, which corresponds to 63 patients suffering from UDH.

Data sources, procedure and means of collection: after verbal consent, all patients underwent a thorough clinical and paraclinical examination. Some data sources were hospitalization, digestive endoscopy and medical record. Clinical data and paraclinical findings were collected using a standardized questionnaire. The questionnaire was used to collect data from 20 participants, data from consultation registers, digestive endoscopy, and medical files during the pilot phase of the study, and it was then validated by the research team. The research team included two (2) hepato-gastroenterologists, one (1) epidemiologist and the doctoral student.

Some information was collected at the bedside and/or from accompanying persons. The data were then entered into Microsoft Excel.

Variables collected: data were collected on:

1) Sociodemographic characteristics (age, sex, marital status);

2) Clinical and paraclinical data (medical history, reasons for consultation;

3) Signs of clinical examination, results of paraclinical examinations);

4) Treatment administered;

5) Patient outcome data (cure, recurrence, death, causes of death and associated factors).

Data entry and analysis:

After correction of outliers, data were entered into Microsoft Excel and analyzed using SPSS version 21.

The analysis plan comprised two stages. First, we carried out a descriptive analysis of the study sample. Quantitative variables were described in terms of mean and standard deviation, and qualitative variables in terms of percentage. Secondly, an association was sought between prognosis (cessation of bleeding, recurrence of bleeding and death) and certain potential explanatory variables (etiologies, time to treatment). The analysis was limited to univariate analysis, and the Chi2 test was used for this purpose. The significance level was set at 5%.

Ethical considerations:

This article is from a medical thesis whose protocol was approved by the scientific committee of the Faculty of Medicine and Pharmacy of Mali. The purpose of the study was explained to all patients, and their verbal agreements to the use of their medical data to help enrich the literature were obtained. Anonymity and confidentiality were respected throughout the study process.

3. Results

3.1. Patient Socio-Demographic Characteristics (Table 1)

Table 1. Patients' socio-demographic characteristics.

Variables	Number (N)	Percentage (%)	Mean ± Standard Deviation
Age (years)			49.7 ± 1899
Sex			
Male	43	68.3	
Female	20	31.7	
		Profession	
Farmer	23	36.5	
Housewife	18	28.6	
Other*	22	34.9	

Other*: Stockbreeders, Tailors, Shopkeeper Teacher.

A total of 63 patients were included. The mean age was 49.7 ± 18.99 years. Males predominated, with a sex ratio of 2.2.

The hospital frequency of upper digestive hemorrhage was 8.99% (63/701 hospitalized patients).

Farmers and housewives accounted for 36.5% (n = 43) and 28.6% (n = 18) respectively. Other professions (breeders, tailors, shopkeepers and teachers) accounted for 34.9% (n = 22).

3.2. Medical and Surgical History and Reasons for Consultation

Medical history was much more frequent, with 84.2% (n = 42) including 50.8% (n = 32) for epigastric pain, 17.5% (n = 11) for jaundice, 9.5% (n = 6) for liver disease, 4.8% (n = 3) for hypertension and 1.6% (n = 1) for digestive bleeding. Surgical history accounted for 11.1% (n = 7).

The mode of onset of bleeding was hematemesis in 34 cases (54%), melena in 16 cases (20.6%) and anemia in 6 cases (9.5%).

The time between onset of the first signs and admission to hospital was less than 24 hours in 4.8% (n = 3), between 24 and 48 hours in 36.5% (n = 23), between 48 and 72 hours in 31.7% (n = 20) and more than 72 hours in 27% (n = 17).

3.3. Patients' Clinical Symptoms (Figure 1)

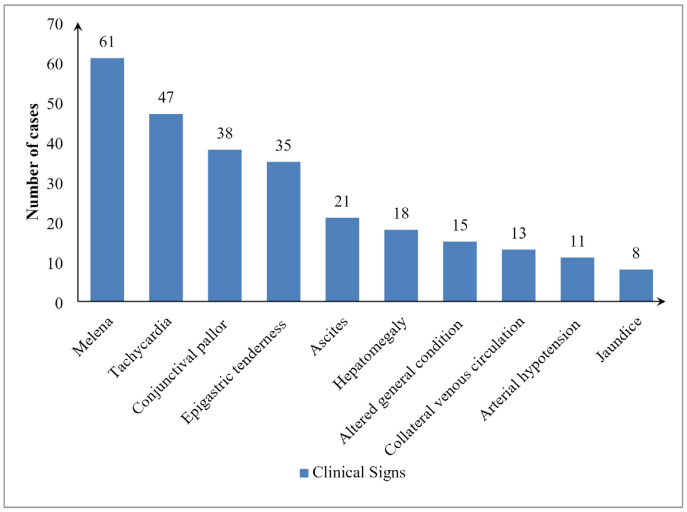

Figure 1. Distribution of patients according to clinical symptoms.

Clinical symptoms were marked by melena in 96.8% (n = 61), tachycardia in 74.6% (n = 47), conjunctival pallor in 60.3% (n = 38), epigastric tenderness in 55.6% (n = 35), ascites in 33, 3% (n = 21), hepatomegaly in 28.7% (n = 18), altered general condition in 23.8% (n = 15), collateral venous circulation in 20.5% (n = 13), arterial hypotension in 17.4% (n = 11) and jaundice in 2.7% (n = 8).

3.4. Results of Additional Tests Performed

Table 2. Distribution of patients according to digestive endoscopy results and time to completion.

Oesogastroduodenal Fibroscopy (n = 40)	Number	Percentage (%)
Type of Lesions		
Esophageal Varices (EV)	15	37.5
Ulcer	10	25
Gastric Tumor	8	20
Esophagitis	1	2.5
Erosive Gastropathy	3	7.5
Erythematous Gastropathy	3	7.5
Time to Completion of Oesogastroduodenal Fibroscopy (OGDF) (Hours)		
48 - 72	16	40
>72	24	60

Hemoglobin levels at admission were below 10 and 7 g/dl in 25.4% and 60.3% of patients, respectively (n = 16 and 38). Only 9 patients (14.3%) had hemoglobin levels above 10 g/dl. Creatinemia was normal in 79.4% (n = 50). Viral markers assayed in 59 patients revealed positive hepatitis B virus antigen (Hbs Ag) in 25 (42.4%) and positive hepatitis C virus antibody (HCV Ac) in 2 (3.4%).

Oesogastroduodenal fibroscopy was performed in 40 cases (63.5%), with a delay of more than 72 hours in 60% (n = 24) from the first bleeding episode. The types of endoscopic lesions were esophageal varices (37.5%), gastric ulcers (25%), gastric tumors (20%), esophagitis (2.5%), erosive gastropathies and erythematous gastropathies in 7.5% each **(**Table 2**).**

3.5. Therapeutic Aspect of Patients (Table 3)

Table 3. Distribution of patients according to treatment administered.

Treatment	Number	Percentage (%)
Blood Transfusion	43	68.3
Number of Pellets (n = 43)		
500 CC	12	27.9
1000 CC	22	51.2
Greater Than 1000 CC	9	20.9
Antibiotic	33	52.4
Proton Pump Inhibitors (PPIs)	54	85.7
Beta-Blockers	14	22.2
Macromolecules	8	12.7
Endoscopic Treatment	2	3.17

All patients were hospitalized, with a length of stay of over 72 hours in 84.1% (n = 53).

Blood transfusions were administered in 43 patients (68.3%), antibiotics in 52.4% (n = 33), proton pump inhibitors in 85.7% (n = 54), antihypertensive (beta-blockers) in 22.2% (n = 14), macromolecules in 12.7% (n = 8) and hemostasis endoscopy in 3.17% (n = 2).

3.6. Outcome of Patients on Treatment (Table 4)

Table 4. Distribution of patients according to outcome.

Variable	Number	Percentage (%)
	Evolution	
Bleeding Stopped	27	79.4
Recurrence of Bleeding	7	20.6
Death	12	19

Continued

Cause of Death (n = 12)		
Encephalopathy	5	41.7
Hemorrhagic Shock	7	58.3

The prognosis of patients undergoing treatment was marked by hemorrhagic arrest in 27 patients (79.4%), recurrence of hemorrhage in 20.6% (n = 7) and death in 12 cases (19%). The main cause of death was hemorrhagic shock, accounting for 58.3% (n = 7).

3.7. Analysis of Patient Prognosis (Table 5)

Table 5. Univariate analysis of patient evolution according to prognostic factors.

Variable	Prognosis						P-Value
	HA*		HR*		Death		
	n	%	n	%	n	%	
Etiologies							
Esophageal Varices	12	80	1	6.7	2	13.3	0.11
Ulcers	10	100	0	0	0	0	
Gastric Tumors	7	87.5	0	0	1	12.5	
Esophagitis	1	100	0	0	0	0	
Erosive Gastropathies	3	100	0	0	0	0	
Erythematous Gastropathies	3	100	0	0	0	0	
Time to Treatment (hours)							
≥72	35	79.6	5	71.4	8	66.7	0.18
<72	9	20.4	2	28.6	4	33.3	
Comorbidity							
Diabetes	2	3.7	1	1.6	4	33.3	0.03
High Blood Pressure	3	100	0	0	0	0	
Clinical Condition							
Hemorrhagic Shock	0	0	0	0	7	58.3	0.007
Encephalitis	2				5	41.7	0.02
Sex							
Male	10	15.8	24	38.1	9	75	0.002
Female	12	19	5	7,9	3	25	
Residence							
Urban	13	48.1	0	0	0	0	
Rural	12	19.1	41	65.1	10	83.3	0.001
History of Taking Traditional Medicines							
Yes	10	15.8	49	77.7	4	33.3	
Non	11	63.4	44	68.2	8	66.6	0.07

Annotation: HA*: Hemorrhagic arrest; HR*: Hemorrhagic recurrence.

Statistical analysis of prognostic factors was limited to univariate analysis. This analysis shows a statistically significant association between the evolution and certain prognostic factors such as diabetes comorbidity ($P < 0.03$), hemorrhagic shock ($P < 0.007$), encephalitis ($P < 0.02$) and rural residence ($P < 0.001$).

4. Discussions

This study was carried out in the internal medicine department of the Sikasso regional hospital in Mali. It took place from August 1, 2022 to July 31, 2023 and included a total of 63 patients with upper digestive hemorrhage.

4.1. Frequency of the Pathology

The hospital frequency of UDH recorded in our series was higher than those reported by some authors [9]-[11]. This difference could be explained, on the one hand, by the under-frequentation of the regional hospital where this study took place and, on the other hand, by the smaller size of our study sample linked to the underestimation of the frequency of UDH in our regions. Indeed, UDH are considered pathologies linked to bad spells according to certain traditions, which leads communities to seek traditional solutions rather than resorting to health services.

4.2. Socio-Demographic Characteristics

The average age of our patients was close to the average age reported in the Western series [12]-[14], but higher than those reported in certain studies carried out in Mali [9] [10] and elsewhere in Africa [7] [15]-[17]. As in several studies in the literature [13] [17]-[20], males predominated in our study. This predominance of males could be explained by the fact that men are more exposed to stress linked to unemployment, poverty and family responsibilities. To cope, they often resort to different types of products such as narcotics, traditional stimulants and other gastro-aggressive products from multiple sources, which are established risk factors for the occurrence of upper GI hemorrhage [18] [21]. The socio-professional strata most affected were farmers and housewives, who had difficulty in accessing care due to poverty, ignorance of the disease, low levels of education and self-medication, which is a factor in aggravation and delayed diagnosis. This same finding has been reported in a number of studies [22] [23].

4.3. Clinical and Paraclinical Data

In our series, as in those reported by some authors, hematemesis and melena were the main reasons for consultation [15] [22] [23]. This indicates irregular use of health facilities by the population, or late recourse to health services due to poverty or low level of knowledge of the pathology.

Concerning the results of complementary examinations, more than half of the patients had severe anemia on admission, with Hb levels below 7 g/dl.

This high proportion of anemia is partly explained by patients' late recourse to

healthcare. This rate of severe anemia is higher than those reported in some African studies [22]-[24]. Endoscopic examination revealed that the main etiological lesions were esophageal varices and peptic ulcer disease, which is in line with some of the data in the current literature [10] [11]. Over the past decade, the incidence of ulcerative digestive bleeding has fallen by more than 20% [25] [26], while therapeutic methods have evolved remarkably. However, the causes reported in our study differed from those reported by some authors, where peptic or gastric ulcers were the predominant etiologies [22] [24] [25] [27]-[29]. The time taken to perform a digestive endoscopy was over 3 days. This is close to that reported by Sombié *et al.* in Burkina Faso (24). Turnaround time is an important factor in the diagnostic profitability of endoscopy, since the earlier it is performed, the more effective it is. The delay observed in performing endoscopy in our study was attributable in the majority of cases to the patients' behavior or their parents'. Indeed, in the general context of our country, patients first begin the treatment with traditional therapists during the first episodes of digestive bleeding and it is only in the event of failure that they seek treatment from modern medicine and generally beyond the first 72 hours. This unfortunate observation whose explanation would be linked to the social interpretation of digestive hemorrhage considered as an act of bad fate. This fact requires the implementation of holistic awareness and communication strategies for social and behavior change at all levels (community, health structures) so that populations understand the importance of early recourse to health care and the dangers linked to self-medication.

4.4. Therapeutic Aspect

Therapeutically, almost all patients (54/63) had access to proton pump inhibitors. This approach to the pharmacological treatment of non-variceal hemorrhage seems rational to us since it was based on the number of cases recorded and is in line with the literature. Hemostasis endoscopy for variceal hemorrhage was rarely performed, despite its proven efficacy. Only two out of fifteen patients suffering from this condition benefited from this method of management. This discrepancy can be explained by the precarious availability of hemostasis devices (esophageal variceal ligation kits, hemostatic glues, clips, plasma-silver, vasoactive substances etc.), frequent breakdowns of the endoscope and the lack of financial resources of patients who were for the most part not enrolled in compulsory health insurance.

As for antibiotic prophylaxis, more than half of patients had access to it, and it was in line with indications which was not the case in the study by Bigoumba at all, where antibiotic prophylaxis in cirrhotic came up against the presumed risk of germ selection expressed by some practitioners [15]. In compliance with contraindications, beta-blocker treatment was prescribed for cirrhotic patients. Forty-three out of sixty-three patients (68.3%) were transfused. This high transfusion rate can be explained by the high rate of severe anemia in our series, where 60.3% of patients had an Hb level of less than 7 g/dl on admission. Because of the non-permanent availability of red blood cells in the hospital blood bank, whole blood

was very often prescribed. Systematic calculation of the Rockall score as part of the clinical routine in emergency medicine in our context would help prevent the deleterious effects of delayed or absent blood transfusion and correlate with the need for transfusion.

4.5. Evolution of Patients Under Treatment

Patient outcome was marked by cessation of bleeding in 79.7%, hemorrhagic recurrence in 20.6% and death in 19%. The rates of hemorrhagic recurrence and death observed in our series are comparable to those reported by Diarra M *et al.* and Koumaré M *et al.* [10] [11], but significantly higher than those of several other authors in studies conducted in Africa and elsewhere [7] [15] [17] [22]-[24] [28] [30]. Our high proportion of hemorrhagic recurrence and death could be explained by several factors, including the high number of cases of hemorrhage due to rupture of esophageal varices, renowned for its high lethality in countries where the technical platform is not up to scratch, the high proportion of hyponatremia, comorbidity, late recourse of patients to health services and the high number of cases of cirrhosis in our series. The causes of death were hemorrhagic shock and encephalopathy, in line with the literature [11] [31].

4.6. Prognostic Factors

Statistical analysis of prognostic factors was limited to univariate analysis. This analysis shows a statistically significant association between the evolution and certain prognostic factors such as diabetes comorbidity ($P < 0.03$), hemorrhagic shock ($P < 0.007$), encephalitis ($P < 0.02$), sex male ($P < 0.02$) and rural residence ($P < 0.001$). These results are close to those reported by Chaabane *et al.*, Sombié *et al.* and Razafimahefa *et al.* where hemorrhagic shock, encephalitis, comorbidities and male sex were associated with the evolution of the disease, particularly the occurrence of deaths and Hemorrhagic recurrence [18] [24] [27].

5. Conclusions

This study shows that the hospital frequency of upper digestive hemorrhage and its lethality remains high at the Sikasso regional hospital, despite under-frequentation.

Pharmacological treatment was dominated by proton pump inhibitors. Hemostasis endoscopy for variceal hemorrhage was rarely performed, despite its proven efficacy, and represents a major challenge for the hospital.

A holistic strategy of communication and community awareness-raising on the dangers of self-medication and the importance of early recourse to health services, as well as strengthening the technical facilities of health centers, are needed.

1) Contribution of study:

One of the advantages of this study, which is the first to be carried out at the Sikasso regional hospital, is that it enables us to carry out a preliminary analysis of the pathology, so that we can make recommendations based on the difficulties

encountered. The study provided an epidemiological, clinical, therapeutic and prognostic profile of UDH treated in the internal medicine department of the Sikasso hospital. The methodology used will enable us to compare our results with those of the literature.

2) Study limits:

Its main limitations were the non-possibility of carrying out of emergency endoscopy outside working hours, the absence of a pre-established protocol for the management of patients on admission to the emergency department, and the non-calculation of the Rockall score.

Also, the impossibility of performing hemostasis endoscopy despite the indication as well as the relatively small sample size constituted a limitation of this study.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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