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ORIGINAL RESEARCH

Upper gastrointestinal haemorrhage: diagnostic, therapeutic, and prognostic aspects at the national teaching hospital Hubert Koutoukou Maga in Cotonou from 2016 to 2020

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Introduction: Upper gastrointestinal haemorrhage (UGH) is a frequent gastroenterology emergency. Our study aims to describe the epidemiological, diagnostic, therapeutic, and prognostic profile of UGH at a central hospital in Cotonou, Benin.

Material and methods: This study is both retrospective and prospective, with data collected from January 2016 to November 2020.

Results: The hospital frequency of UGH was estimated at 0.86%. The mean age was 52 ± 17 years, with a 2.9 male-to-female ratio. The most frequent aetiology was gastric and duodenal ulcers (GDU) in 35%. In a univariate analysis, the factors associated with bleeding recurrence were cirrhosis ($p = 0.03$), an abundance of bleeding ($p < 0.001$), and a Rockall score > 2 ($p < 0.001$). In a univariate analysis, age, recurrence, and a Rockall score < 2 were associated with mortality.

Conclusion: UGH is uncommon in Cotonou. In our study, an age above 50, the notion of rebleeding, and a Rockall score < 2 were risk factors associated with death.

Keywords: upper gastrointestinal bleeding, aetiologies, mortality, associated factors

Introduction

Upper gastrointestinal haemorrhage (UGH) is a serious gastroenterological emergency. By definition, UGH is bleeding from a lesion in the digestive tract upstream of the angle of Treitz.[1] There has been an overall reduction in the incidence of UGH, although this varies from one study to another.[2] In the event of UGH, endoscopy performed within 24 hours of bleeding enables an aetiological diagnosis in over 90% of cases.[3] UGH is a potentially serious, life-threatening condition. The mortality rate for UGH varies between 2% and 10%, depending on the cause.[2]

The main aetiologies of UGH are gastric and duodenal ulcers (GDU) disease, bleeding associated with portal hypertension, and acute gastroduodenitis secondary to gastropathy medication, e.g. nonsteroidal anti-inflammatory drugs (NSAIDs). Managing these haemorrhages requires multidisciplinary collaboration. New endoscopic techniques and therapies have improved immediate management and reduced the risk of recurrence.[2,4,5]

Some data exist from previous work in Benin, notably at the Central National University Teaching Hospital Hubert Koutoukou Maga (CNHU-HKM).[6] However, we felt it important to reassess the management of this condition and update the various data. This work aims to describe the epidemiological, diagnostic, therapeutic, and prognostic profile of UGH at the CNHU-HKM in Cotonou from 2016 to 2020.

Material and methods

Data collection was both retrospective and prospective, including all patients who presented with UGH. It took place over four years and 11 months, divided as follows: a retrospective phase of four years and eight months from 1 January 2016 to 16 August 2020 and a prospective phase of three months from 17 August 2020 to 17 November 2020. The study was conducted in the emergency, intensive care, and hepato-gastroenterology university clinics of the HKM-CNHU in Cotonou, Benin.

The study included patients admitted to one of the three abovementioned departments who presented with objective clinical signs of acute externalised UGH (haematemesis and/or melena and/or profuse haematochezia) or non-externalised UGH (hypovolaemic shock or acute anaemia associated with upper gastrointestinal bleeding) on admission or during hospitalisation. In addition, an upper gastrointestinal endoscopy must have been performed, and patients must have given verbal consent (during the prospective phase) for inclusion. We did not include patients with incomplete medical records and unknown outcomes or those with chronic anaemia without external bleeding.

At endoscopy, the aetiological diagnosis of UGH was made when a lesion was found to be bleeding or likely to have bled upstream of the angle of Treitz. We conducted exhaustive recruitment, considering all cases of UGH corresponding to our inclusion criteria during the study period. Epidemiological data, clinical information, endoscopic findings, treatment received, and

patient progress during hospitalisation were collected using a standardised questionnaire.

We used the Rockall score, a pre-endoscopic and endoscopic score assessing the risk of recurrence and death after admission. The score is calculated by assigning points (0, 1, 2, or 3) to each variable (age, systolic blood pressure, heart rate, comorbidity, diagnosis at endoscopy, signs of bleeding at endoscopy). The total score was calculated by simple addition and ranged from 0 to 11. If the score was ≤ 2, the prognosis was good. If the score was > 5, the risk of death remained high.

Data entry was performed using EpiData 4.6 software. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 25 software. We also used the Fisher's exact test to analyse quantitative variables, then performed a multivariate analysis using logistic regression to identify factors predictive of haemorrhagic recurrence and mortality. Differences in results were considered significant with a probability of $p < 0.05$.

Results

A total of 202 patients with UGH were identified, of whom 198 were included in the retrospective study and four in the prospective study. There were 113 excluded cases: 10 were not found, 41 had incomplete records (missing sociodemographic, diagnostic, or therapeutic data), and 61 patients had not undergone an upper endoscopy. The final analyses included 89 UGH cases.

Socio-economic characteristics

The hospital frequency of UGH was estimated at 0.86% (202 among all 23 488 patients). The mean age was 52 ± 17 years. Age ranged from eight to 90 years old. Regarding gender, male predominance was 74% (n = 66), with a 2.9 sex ratio. All socio-professional categories were represented in the study population, although a lower socio-economic start was evident, with 59% having a monthly salary of less than 159.62 USD.

Clinical and biological aspects

The most frequent clinical expression in this series was haematemesis in 85% (n = 76), with both haematemesis and melena present in 46% of patients (n = 41) (Table I). Haematemesis only was the most frequent mode of presentation (35%) (Table I).

Table I: Breakdown of patients by mode of onset

	n	%
Haematemesis and melena	41	46
Haematemesis	31	35
Melena	9	10
Melena and rectorrhagia	8	9
Hematemesis, melena and rectal bleeding	7	8
Rectorrhagia	2	2
Acute anaemia	1	1

UGH occurred at home in 93% of patients (n = 83), while 7% bled during hospitalisation (n = 6). The average admission time was 12.2 ± 4.7 hours, with a minimum of one hour and a maximum of three days. Concerning estimated blood loss volume, 53% bled less than 750 ml. The dominant risk factor was NSAID use (37%, n = 33). Epigastric pain was the most important physical manifestation (53%, n = 47). Of the study population, 81% had a haemoglobin level below 10 g/dl (n = 72), and 79% had a haematocrit level below 30% (n = 72).

Aetiological aspects

Most patients (94%) underwent endoscopy more than 24 hours after the onset of UGH. The average delay was 9.7 ± 7 days, with outliers of one and 60 days. The origin of bleeding was found in 83% of our patients (n = 74). The most frequent causes were GDUs in 35%, oesophageal varices (EV) in 28%, and gastritis in 12% (Table II).

Table II: Distribution of patients according to causal lesions objectified by oesophago-gastro-duodenal endoscopy

	n	%
Gastritis	38	43
Gastric and duodenal ulcer	38	43
Oesophageal varices	25	28
Portal hypertension gastropathy or gastric varices	14	16
Oesophagitis or oesophageal ulcer	13	15
Hiatal hernia	8	9
Gastroduodenal erosions or ulcerations	4	4
No lesion identified	4	4
Gastric tumour	3	3
Others	25	28

NB: The other lesions were mainly represented by pangastritis (7%); the rest were oesophageal candidiasis, bulbar diverticula, oesophageal polyps, gastric polyps, ulcerative-budding lesions of the pylorus, and ulcerative-budding antro-pyloric lesions.

Therapeutic aspects

UGH management was initiated within 24 hours of the onset of bleeding in 70% of patients (n = 62). Patients with haematemesis were in the majority among those who came earlier within 24 hours.

Proton pump inhibitors (PPI) were the most used (94%, n = 84). Furthermore, tranexamic acid was used in 72% of patients. The mean number of red blood cells transfused was 2.65 ± 1.25 U. All patients with diagnosed ulcers (gastric/duodenal) and suspected *Helicobacter pylori* infection were prescribed eradication therapy.

Patients with EV or gastric varices (GV) and no contraindications were given a beta blocker (Propranolol). In addition, three endoscopic haemostasis procedures were performed: two EV ligations and one clip placement in the case of gastric ulcer. Surgery was not performed in any case.

Outcomes

The average number of in-hospital days was 7 ± 5.7 days, ranging from one to 30 days. Repeat endoscopy was performed in 10 patients (11%). Over one month after admission, most patients had a favourable outcome (81%). Recurrences of UGH occurred

Table III: Multivariate analysis study of the association between prognostic factors and UGH recurrence

	Multivariate analysis		*p*-value
	OR	95% CI	
Abundance of bleeding (ml)			
< 750	1 386 797.29	0.000 to 1.0E12	0.9607
750–1 500	396 227.798	0.000 to 1.0E12	0.9642
1 500–2 000	33 018.9832	0.000 to 1.0E12	0.9711
> 2 000	-	-	1
Upper gastrointestinal bleeding	0.7311	0.21 to 2.52	0.6205
Arterial hypertension	0.0001	0 to 1.0E12	0.9784
Cirrhosis	1.022	0.21 to 4.83	0.9782
Portal hypertension	0.1588	0.02 to 1.07	0.0588

CI – confidence interval, OR – odds ratio, UGH – upper gastrointestinal haemorrhage

Table IV: Factors associated with death in univariate analysis

	Deceased			OR (95% CI)	*p*-value
	No	Yes	%		
Age					
> 50	54	10	19	6.89 (0.79 to 52.88)	0.043
0–50	35	1	3	0.11 (0.01 to 0.95)	0.22
Recurrence					
Yes	22	7	32	7.35 (1.90 to 28.39)	0.004
No	67	4	6	-	
Rockall score					
≤ 2	51	1	5	0.05 (0.001 to 0.44)	0.00006
> 2	38	10	26	1	

CI – confidence interval, OR – odds ratio

in 23% of the study population (n = 20). Mortality was 12% (n = 11).

Prognostic aspects

In univariate analysis, factors associated with recurrent bleeding were cirrhosis (p = 0.03, odds ratio [OR] = 4), varices (p = 0.0006, OR = 6.6), a Rockall score > 2 (p = 0.0000023, OR = 16), and bleeding volume (p = 0.0001, OR = 9.4 for bleeding > 750 ml). On multivariate analysis, no predictors of recurrence were identified (Table III).

In univariate analysis, factors associated with death were age over 50 (p = 0.043, OR = 6.89), recurrence of UGH (p = 0.004, OR = 7.35), and a Rockall score > 2 (p = 0.00006, OR = 0.05) (Table IV). Applying the Rockall score to our study population, we found 51 patients (57%) with a score ≤ 2. These patients had a low risk of death. In multivariate analysis, only a Rockall score ≤ 2 was associated with a very low risk of death among patients (OR = 0.0853, p = 0.0465) (Table V).

Discussion

The hospital frequency of UGH at CNHU-HKM was low (0.86%) and is similar to, albeit higher, than in published literature.[2,7] Our slightly higher bleeding rate may be accounted for by limited healthcare access for routine follow-ups. Our study's population was quite young, with an average age of 52 ± 17 years. The results of El Mekkaoui et al.[8] in 2011 in Morocco (47.6 ± 17.7 years) and Bagny et al.[9] in 2012 in Togo (45–54 years) were similar to ours. Africa's younger mean population age could explain this. UGH populations are older in the developed world.[10-11] This is possibly

Table V: Multivariate analysis study of the association between prognostic factors and UGH-related deaths

Multivariate analysis			
	OR	95% CI	*p*-value
Age > 50	8.8402	0.80 to 96.67	0.0742
Recurrence of upper gastrointestinal bleeding	0.37	0.06 to 1.98	0.2471
Tumour	2.2889	0.17 to 30.20	0.5293
Rockall score ≤ 2	0.0853	0.007 to 0.96	0.0465
Chronic alcohol consumption	0	0 to 1.0E12	0.9627

CI – confidence interval, OR – odds ratio

related to a higher use of NSAIDs in an older population. The use of aspirin for cardiovascular prevention among older patients is another possible reason.

Males predominated with a sex ratio of 2.9 (74%, *n* = 66), observed universally in the literature.[6,9,12] The male predominance of UGH could be linked to certain UGH risk factors being higher in men (e.g. alcohol use). In addition, some data suggests that oestrogen has a protective effect against UGH in the gastrointestinal tract premenopausally.[13]

In our study, the combination of haematemesis and melena was the most frequent presentation of UGH (46%, *n* = 41). Isolated haematemesis and isolated melena accounted for 35% and 10% of our sample, respectively. Our experience differs from published data.[6,14]

Most patients who arrived at the hospital within 24 hours had haematemesis (30%, *n* = 27), suggesting that haematemesis was more likely to prompt urgent consultation than melena. The time interval between the start of UGH and hospitalisation was less than 24 hours for 70% of patients (*n* = 62). On the other hand, 30% (*n* = 27) came more than a day later (between one and 30 days). It should be noted that 7% of our sample (*n* = 6) had had their UGH during hospitalisation. This is shorter than previously observed in our department in the early 2000s. Of the patients, 47% were seen after 48 hours.[6]This early hospitalisation delay was comparable to that observed in acute non-traumatic abdominal pain in the same hospital.

In a 2018 study, 46 out of 106 patients (44.7%) received for acute non-traumatic abdominal pain consulted the hospital less than 24 hours after onset, and 25 (24.3%) were received between the 24th and 72nd hour.[15] Conversely, for sub-acute or chronic pathologies, consultation times are much longer. In a survey by Sokpon et al.,[16] of the general population in Cotonou in 2019, out of 768 people questioned, 32 had irritable bowel syndrome according to the Rome IV criteria. Of these, 10 (31%) said they consulted a doctor within an average of 7.5 weeks, with extremes of 1–52 weeks.[16]

In our study, NSAID use was the most common risk factor (37%, *n* = 33). Bagny et al.[9] also identified the use of NSAIDs as the most frequent risk factor (17%). NSAID use in Benin is high, supported by our data.[6] Tranexamic acid was administered to 72% of patients in our series. Our sample had no association with recurrence or death, suggesting it had little potential to reduce recurrence or mortality. PPI use is universal and the standard of care. We used intravenous PPI (94%), even those with varices.

The current recommendation for emergency endoscopy is less than 24 hours.[2,17] In our study, 6% of patients could undergo endoscopy within 24 hours of the onset of bleeding. The average delay was 9.7 ± 7 days. We clearly need to improve this in our setting. In Africa, our results were similar to those of Bignoumba et al.[18] in 2019 in Gabon, who obtained an average endoscopy access time of eight days (extremes of 0 and 40 days).

Several endoscopic techniques are now available for the effective management of UGH. In our study, three patients benefited from endoscopic haemostasis (two EV ligations and one clip placement). This low rate of endoscopic haemostasis could be explained by the high cost of these techniques for most of the study population, the lack of equipment availability in our mainly public hospitals, and the absence of an on-call digestive emergency service. For example, the EV ligation kit required by 28% (*n* = 25) of our sample costs between 119 and 134 euros, or 78 000–88 000 FCA francs.[19]

It should also be noted that several means of endoscopic haemostasis do not yet exist in Benin, including haemostatic powder, the use of biological glue, and thermal methods (heating probes, garnet laser, argon plasma electrocoagulation, etc.). Mortality in UGH is currently estimated at 10%.[2,20] The slightly higher rate in our study (12%) could be explained by the high proportion of variceal bleeds.

Conclusion

The hospital frequency of UGH at CNHU-HKM is low, with NSAID use as the most frequent risk factor. Patients aged above 50 and bleeding recurrence were risk factors associated with mortality.

Conflict of interest

The authors declare no conflict of interest.

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