Original Research Article	**Hepato-Gastro-Enterology**

Upper Gastrointestinal Bleeding: A Prospective Epidemiological Study about 72 Cases and Review of the Literature

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Abstract

Introduction: Upper gastrointestinal bleeding (UGIB) is a frequent cause of medical care. They constitute medical and surgical emergencies that quickly involve the patient's vital prognosis. The main objective of this work is to study the epidemiological profile of UGIB. ***Materials and Methods:*** Our work is a descriptive prospective study including all patients admitted for upper gastrointestinal bleeding from January to December 2020. All patients received specific emergency care as well as upper endoscopy. ***Results:*** 72 patients with UGIB were included, 31 men (43.1%) and 41 women (56.9%). The average age is 56.5 ± 6.8 years. UGIB was manifested as isolated melena (40.3%), hematemesis associated with melena (25%). On admission, hemoglobinemia was below 7 g/dl in 51.4% of cases. The history of the patients was dominated by portal hypertension (PHT) (13.7%), taking antiplatelet agents (13.7%) and anticoagulants (11%). The average time for completion of the upper endoscopy is $36.97h \pm 8.9$. The main diagnoses were ulcer bleeding (34.7%), PHT related bleeding (23.67%), and gastritis (16.6%). Bleeding recurrence and mortality were estimated at 25% and 5.6% of cases respectively. ***Conclusion:*** The majority of upper gastrointestinal bleeding occurred in patients over 60 years old. The most common etiologies are ulcer disease and bleeding related to portal hypertension. Gastroscopy is the key examination and constitutes the main stage for diagnostic, etiological, prognostic and therapeutic purposes.
Keywords: Upper gastrointestinal bleeding, epidemiology, hematemesis, melena, peptic ulcer disease, portal hypertension, endoscopic hemostasis.

I. INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is one of the main digestive emergencies, and remains an important cause of morbidity and mortality. It constitutes a medico-surgical emergency that quickly involve the patient's vital prognosis.

UGIB corresponds to bleeding originating upstream from the ligament of Treitz (esophagus, stomach and duodenum) and usually manifests as hematemesis or melena. The only exception is the hemorrhagic ulcer of the posterior surface of the bulb with erosion of the gastroduodenal artery which is revealed by massive rectal bleeding with a state of shock [1, 2].

Significant progress, both in endoscopic hemostatic treatment and in medical treatment, has been achieved in recent years, particularly for the two causes that remain the most frequent, ulcerative bleeding and portal hypertension. These advances have been the source of a reduction in overall mortality while the affected population is increasingly elderly.

The annual incidence of acute gastrointestinal bleeding in adults is difficult to specify. Anglo-Saxon epidemiological studies estimate it at 50 to 150 episodes per 100,000 inhabitants [4, 5]. The incidence seems to be decreasing with a fall for upper gastrointestinal bleeding of 23% between 2001 and 2009 and of 34% for ulcerative bleeding. Gastrointestinal bleeding motivates hospitalization in 80% of cases and occurs in hospital in 20% of cases [1, 6]. The bleeding recurrence rate is 11.5% for ulcerative upper gastrointestinal bleeding and 11% in cases of portal hypertension [7-9].

More than two-thirds of gastrointestinal bleeding is of upper origin. The diagnostic performance of endoscopy is about 85%, increases with the precocity

of the examination and it is recommended to perform it within the first 24 hours [10].

The mortality rate of upper gastrointestinal bleeding is between 5 and 10%, and varies depending on the cause [6].

The management of UGIB requires multidisciplinary collaboration involving emergency physicians from hospital pre-admission, gastroenterologists, radiologists and surgeons. It includes hemodynamic stabilization followed by hemostatic treatment which depends on the lesion causing the hemorrhage.

The main objective of this work is to study the epidemiological, clinical and etiological profile of exteriorized UGIB and to analyze their treatment according to the etiology.

II. MATERIALS AND METHODS

Our work is a descriptive prospective study that includes all patients over the age of 18 admitted for exteriorized upper gastrointestinal bleeding from January to December 2020 in the emergency room and in the Hepato-Gastro-Enterology and Proctology Department "Medicine B" of the Ibn Sina University Hospital Center, Rabat.

All patients benefited from emergency care including conditioning (compensation for blood loss by saline serum or blood transfusion + PPI and/or Sandostatin® depending on the assumed etiology) as well as digestive fibroscopy. Depending on the results of the endoscopy, hemostatic and etiological treatment was carried out. We collected epidemiological, clinical, paraclinical, endoscopic and therapeutic data using an operating sheet.

Were excluded from this study:
- Patients who had hidden bleeding revealed by anemia.
- Records with incomplete data on the operating sheet.

III. RESULTS

Over the period of one year, a total of 72 patients hospitalized for manifested UGIB were included in our study. There are 31 men (43.1%) and 41 women (56.9%). The sex ratio was (F/M)=1.28. The average age was 56.5 ± 6.8 years with extremes varying from 20 to 90 years (Table 1).

The distribution according to age groups was as follows: 14 patients were <40 years old (19.4%), 17 patients between 40-60 years old (23.6%) and 41 patients >60 years old (56.9%). The age distribution is different between the two sexes.

Hemorrhage was manifested in the form of isolated melena in 29 patients (40.3%), hematemesis associated with melena in 18 patients (25%), hematemesis alone in 17 patients (23.6%) and hematochezia in 8 patients (11.1%). The hemoglobin (Hb) level of the patients varied from 2 to 14.6 g/dl, this rate was lower than 10 and 7 g/dl respectively in 53 patients (73.6%) and 37 patients (51.4%) (Table 1).

The personal history related to the hemorrhagic risk was essentially portal hypertension in 10 patients (13.7%) including 5 cirrhotic patients, known peptic ulcer in 3 patients (4.1%). The intake of gastrotoxic medication was found in 18 patients (25%) mainly antiaggregants in 10 patients (13.7%) and anticoagulants in 8 patients (11%). Active smoking was noted in 5 patients (6.9%) and alcohol consumption in 1 patient (1.4%) (Table 1).

The main comorbidities were heart disease (hypertensive and ischemic) in 8 patients (11.1%), chronic kidney failure in 3 patients (4.2%) and diabetes in 3 patients (4.2%).

Rockall and Glasgow-Blatchford scores were calculated for all patients. The Rockall score was > 3 in 47 patients (65.3%) and the Glasgow-Blatchford score (GBS) was > 8 in 38 patients (52.8%).

Table 1: Patient characteristics

Variable	*n* (number total =72)	Percentage %
Gender		
Man	31	43.1
Woman	41	56.9
Sex ratio F/M	1.28	
Age		
Middle age	56.5±6.8 years	
Extremes	20 to 90 years old	
Distribution by age group		
<40 years old	14	19.4
40-60 years old	17	23.6
>60 years old	41	56.9

Variable	*n* (number total =72)	Percentage %
Mode of externalization of UGIB		
Melena isolated	29	40.3
Hematemesis associated with melena	18	25
Hematemesis alone	17	23.6
Hematochezia	8	11.1
Admission hemoglobin level		
Hb <7g/dl	37	51.4
Hb <10g/dl	53	73.6
Average admission rate		7.3g/dl
History related to hemorrhagic risk		
PHT	10	13.7
Taking antiaggregants	10	13.7
Taking anticoagulants	8	11
GDU known	3	4.1
Comorbidities		
Heart disease (hypertensive and ischemic)	8	11.1
Cirrhosis	5	6.9
Chronic renal failure	3	4.2
Diabetes	3	4.2

The average time between admission and the performance of fibroscopy was approximately 36.97h ± 8.9. Endoscopy was performed in 45 patients (65%) within 24 hours of their admission to the hospital emergency room.

The main lesions found during upper endoscopy were gastroduodenal ulcers (GDU) in 25 patients (34.7%), esophageal varices (OV) ± gastro-esophageal varices (GOV) in 17 patients (23.6%) and gastritis in 12 patients (16.6%). No lesion was found in 2 patients (2.7%) (Table 2)

Table 2: Types of lesions found on FOGD

Types of lesions	*n* (number total =72)	Percentage %
Peptic ulcers	25	34.7
OV±GOV	17	23.6
Gastric angiodysplasias	5	6.8
Peptic esophagitis	5	6.8
Gastric tumor process	4	5.5
Vaterian ampulloma	2	2.7
Gastritis	12	16.6
No lesions found	2	2.7

The stay in an intensive care unit was necessary in 14 patients (19.4%) for hemodynamic instability and/or consciousness disorders. Red blood cell transfusion was performed in 41 patients (56.9%). Injectable proton pump inhibitor (PPI) medical treatment was administered to all our patients. Before endoscopy, treatment with vaso-active drugs (Sandostatin®) was administered to 21 patients (29.2%) who presented signs and/or a history in favor of PHT.

Endoscopic hemostasis was performed in 19 patients (26.4%). The hemostatic technique was guided by the etiological diagnosis of the hemorrhage. With the presence of esophageal varices (OV), hemostasis was performed by OV ligation in 11 patients (15.3%). The gastric varices filling technique with biological glue was performed in 1 patient (1.4%). The thermal method by argon plasma coagulation (APC) was used in 4 patients (5.6%). The mechanical method by placing hemostatic clips was used in 2 patients (2.8%), this technique was associated with the injection of vasoconstrictor products (adrenaline serum) in quadrants. The Hémospray® hemostatic powder type was used in 1 patient (1.4%) (Graph1).

Bleeding recurrence was observed in 25% of cases (n=18). Four deceased patients were recorded (5.6% of cases). The average duration of hospitalization was estimated at 3 days, varying between 1 day and 9 days.
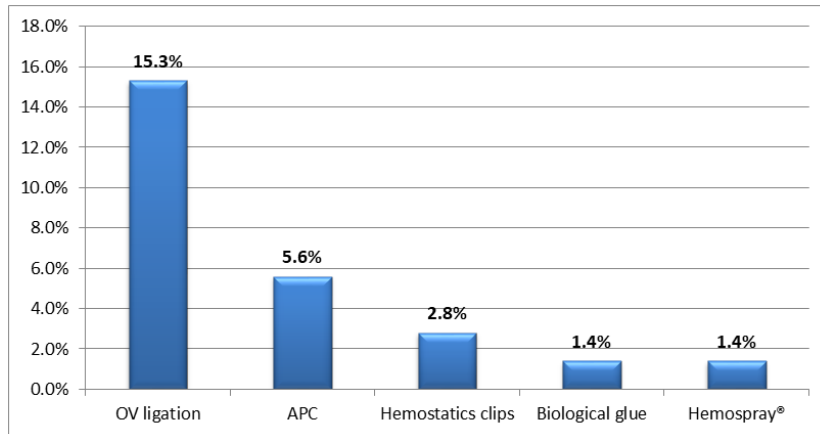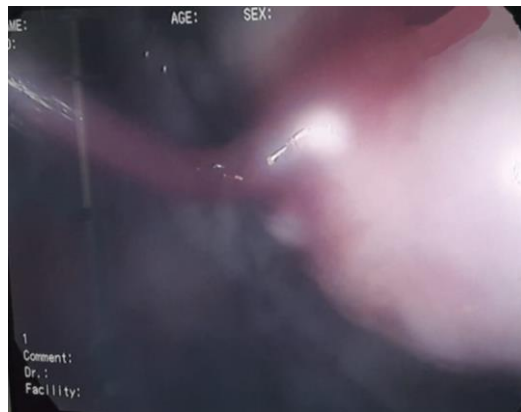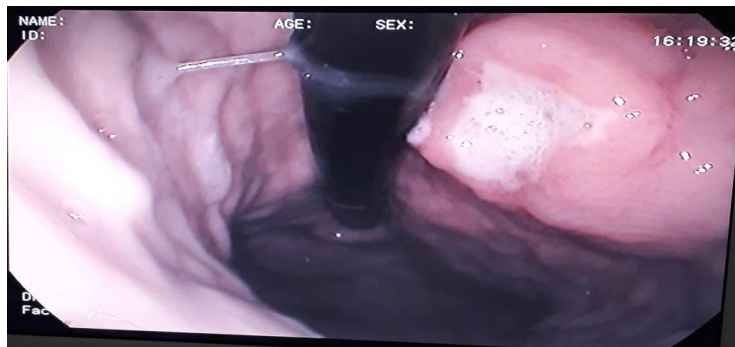
Figure 1: Endoscopic hemostasis techniques

Picture 1: Active bleeding by breaking of gastric varices

Picture 2: Biological gluing session of gastric varice of type 2

Picture 3: Clean-bottom gastric ulcer with suspicious-looking hypertrophic margins

IV. DISCUSSION AND LITERATURE REVIEW

Among the 72 patients included in our study, there is a female predominance (56.9%), this trend has been rarely reported in the literature, it is found in the study conducted by Itoudi Bignoumba *et al.,* [11] who reported that 52.3% of patients included in his study were female. However, most African, European and American series showed a male predominance ranging from 60.7 to 77% [12-16]. The majority of our patients are over 60 years old (56.9%). This is in line with the data reported in African series, such as the study conducted by El Mekkaoui A *et al.,* [12] in Morocco, which showed that the incidence of UGIB increases in elderly subjects. The same observation was reported by the European or North American series [17, 19]. In the study by *Van Leerdam ME et al.* [17] patients over the age of 60 accounted for more than 70% of cases. Blatchford O *et al.,* [18] and Paspatis GA *et al.,* [19] found in their series that the incidence increases sharply with age, respectively from 6 to 20 times higher in people aged over 75 years. This is well illustrated by the French study by Nahon S *et al.,* [25] which showed that for a median age of 64.1 years, patients aged ≥75 years accounted for approximately 32.5%. Furthermore the recent study of "SANGHRIA Study Group" showed results close to 38.2% of those over 75 years old.

This increase in frequency can probably be explained by the increasing consumption of antiplatelet agents, anticoagulants and by the aging of the population [19, 27].

In our series, our patients have an average age of 56.5 ± 6.8 years. Moroccan series have reported similar average ages, in particular the studies of Drari S [20] and Ouchker I [21] which reported an average age of 58 and 51 years respectively. The majority of African series have reported an average age of patients varying between 46.8 and 49.2 years [12-14, 22, 23]. This average age in the Maghreb and in sub-Saharan Africa is lower than that found in the Western series which report an average age of between 63 and 68.5 years [19, 24, 25, 26, 29]. The difference in the average age in our study compared with studies from Western countries reflects the difference in the age pyramid with the general population of these countries [18, 19, 27].

On the clinical level, in our series we found that the hemorrhage was manifested mainly in the form of either isolated melena in 40.3% of cases, or hematemesis associated with melena in 25% of cases. These results are comparable to those reported by the series in the literature but in higher proportions [11, 19, 26, 28]. On the other hand, other series have reported hematemesis alone as the main clinical sign [12, 22, 23]. In the series by Ntagirabiri R *et al.,* [14] the bleeding mainly manifested through hematemesis associated with melena in 50.8% of cases. The recent French study by Quentin V *et al.,* [29] reported that melena was present in 73.9% of patients.

In our study, hemoglobin (Hb) level below 10g/dl and 7g/dl was found in 73.6% and 51.4% of cases respectively. In terms of transfusion needs, it was reported that 56.9% of patients required a transfusion of red blood cells before the endoscopy was performed. Comparable results were found by El Mekkaoui A *et al.,* [12] who reported that 73.2% and 43.2% of his patients had Hb below 10g/dl and 7g/dl respectively, with a lower proportion of transfused patients (30.2%). The French study by Nahon S *et al.,* [25] reported that 64% of patients (n=2050) had Hb <10g/dl and that 63% (n=2018) were transfused. The restrictive attitude towards blood transfusion explains the drop in transfusion requirements.

The personal history linked to the hemorrhagic risk was essentially portal hypertension and a history of peptic ulcer known in 13.7% and 4.1% of cases respectively. Active smoking was reported in 6.9% of cases. The results of the literature are very varied concerning the antecedents and the most frequently encountered is the antecedent of GDU ranging from 8 to 29.5% [12-14, 25]. While *Alatise OI et al.* [28] reported smoking in 2.8% of cases.

Some authors have shown that there is a strong gradual association between the occurrence of non-variceal upper gastrointestinal bleeding (NVUGIB) and comorbidities. This risk increases with the number of comorbidities and these are risk factors that increase the likelihood of bleeding.

Comorbidities are related to cardiovascular diseases, cancers, renal insufficiency, respiratory insufficiency, chronic liver disease, diabetes and advanced age (> 75 years). This may also explain why the incidence of UGIB remains high in an elderly population [30-32].

In our series, the comorbidities were mainly heart disease (hypertensive and ischemic) in 8 patients (11.1%), chronic kidney failure in 3 patients (4.2%) and diabetes in 3 patients (4.2%). Taking antiplatelet agents and anticoagulants was found in 13.7% and 11% respectively.

Most authors have noted comorbidities in their series, for Okon AJB *et al.,* [13] the most common comorbidity was kidney failure in 6.2%. Alatise, OI *et al.,* [28] described comorbidities related to heart disease in 23.7%, diabetes mellitus in 3.8% and kidney failure in 1.4% of cases.

In our series, the Rockall score was > 3 in 65.3% of cases and the Glasgow-Blatchford score was > 8 in 52.8% of cases. Our results are superior to those reported by Bignoumba PE *et al.,* [11] the GBS was > 8

in 37.1% of the patients and the Rockall score was > 3 in 25.7% of the patients.

Endoscopy is the main diagnostic and therapeutic modality for UGIB. The endoscopic delay (the interval between hospital admission and endoscopy) during UGIB has been adopted by the National Institute for Health and Clinical Excellence (NICE), the European Society for Gastrointestinal Endoscopy (ESGE) and the Joint Advisory Group on Gastrointestinal Endoscopy (JAG) as a quality standard for patients and endoscopy units. NICE and ESGE recommend early endoscopy within 24 hours of admission for all patients admitted with suspected NVUGIB [33-35].

In our study, the average time between admission and completion of upper endoscopy was approximately 36.97h ± 8.9. Endoscopy was performed in 45 patients (65%) within 24 hours of their admission to the hospital emergency department.

The Moroccan series reported similar results, 65% of patients had endoscopic exploration within 24 hours [12], while the rate was lower at 56% for endoscopies performed within 24 hours for the series by Drari S [20].

Other authors of African series have reported much longer average delays ranging from 3 days for Okon AJB *et al.,* [13], 3.6 days for Roger S *et al.* [23] 8 days for Itoudi Bignoumba PE *et al.,* [11]. For the latter only 11.4% were able to do an endoscopy within 24 hours.

In our emerging countries, access to care remains limited on the one hand and on the other hand patients consult late and are admitted in a state requiring first clinical stabilization (especially hemodynamic) before carrying out endoscopy. This can also be increased by the impact of comorbidities on the general condition of patients. This is illustrated by the high rate of patients initially hospitalized in an intensive care unit (19.4%) and those who required a transfusion of red blood cells before carrying out the endoscopy (56.9%), in addition the lack packed red blood cells at transfusion centers cause delays in endoscopy while awaiting transfusion.

Western series report higher performance in terms of endoscopy completion times. Indeed, in the French study by Quentin V *et al.,* [29] 83.4% of endoscopies were performed within 24 hours. The British study by *Siau K et al.,* [33] the median time to perform the endoscopy was 21.2 hours, but this time varied in the different centers included in the study (9.2 to 42.5 hours). Multivariate analysis of the data from this study revealed that a higher Glasgow-Blatchford score, time of admission between 7:00 p.m. and 7:00

a.m. or via the emergency department were independent predictors of delayed endoscopy.

In our series, peptic ulcer disease is the first cause of UGIB followed by esophageal varices. These results are consistent with those of the African series, which for the most part reported GDU as the first etiology followed by PHT-related bleeding [11-13, 22, 28, 23].

The Western and American series have reported comparable results, ulcerative pathology found in 28–59% [4]. The French study by Quentin V *et al.,* [29] found ulcerative pathology in 44.9% and PHT-related hemorrhage in 18.9% of cases. The British study conducted by *Oakland K.* [36] demonstrated that in the United States and the United Kingdom the most frequent cause is peptic ulcer disease, accounting for approximately 32 to 36% of all hospitalized patients. On the other hand, the next most frequent diagnosis is esophagitis (24%) and variceal bleeding represents only 11% of hospitalizations for UGIB [24].

In our series, the evolution was marked by a bleeding recurrence in 18 patients (25% of cases) and 4 patients died (5.6% of cases). The average duration of hospitalization was estimated at 3 days.

In the African series [12-14, 22, 23, 37] bleeding recurrence varied from 4.2% to 14.7 % while overall mortality varied from 3% to 18%. In the Western and American series [21, 38], the reported mortality was 12.5% and 2.1%, respectively. This American study showed that UGIB related mortality fell in the United States from 4.7% to 2.1% in two decades.

V. CONCLUSION
Upper gastrointestinal bleeding occurs mainly in the elderly, more than half of patients were over 60 years old. Taking gastrotoxic medication is the main associated factor.

The most common etiologies are ulcer disease and hemorrhage related to portal hypertension.

Gastroscopy is the key examination and constitutes the main stage for diagnostic, etiological, prognostic and therapeutic purposes.

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