



RAPID COMMUNICATION

## Management of digestive bleeding related to portal hypertension in cirrhotic patients: A French multicenter cross-sectional practice survey

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early vasoactive drug administration (87% of cases), association with ligation (42%) more often than sclerosis (21%) at initial endoscopy, and antibiotic prophylaxis (64%). By contrast, prescription of beta-blockade alone or in combination (0 to 100%,  $P = 0.003$ ) for secondary prophylaxis and lactulose (26% to 86%,  $P = 0.04$ ), differed among centers.

**CONCLUSION:** In French hospitals, management of bleeding related to portal hypertension in cirrhotic patients is generally in keeping with the consensus. Broad variability still remains concerning beta-blockade use for secondary prophylaxis. Screening for esophageal varices, the use of antibiotic prophylaxis and patients information need to be improved.

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**Key words:** Digestive bleeding; Portal hypertension; Cirrhosis; Evaluation studies

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### Abstract

**AIM:** To investigate the conformity of management practices of gastrointestinal hemorrhage in cirrhotic patients with relevant guidelines.

**METHODS:** A questionnaire on the management of digestive bleeding was completed for all consecutive cirrhotic patients admitted to 31 French hospitals.

**RESULTS:** One hundred and twenty-six bleeding events were recorded. It was the first bleeding episode in 79 patients (63%), of whom 40 (51%) had a prior diagnosis of cirrhosis and 25 (32%) had previously undergone an endoscopy. The bleeding episode was a recurrence in 46 patients (37%). The median time between onset and admission was 4 h, but exceeded 12 h in 42% of cases. There was an agreement between centers for

### INTRODUCTION

Gastrointestinal hemorrhage is a major complication of cirrhosis, and several consensus conferences<sup>[1,2]</sup> have attempted to standardize its management. All the recommendations are based on results of meta analysis of randomized trials, which are designed to assess the efficacy of treatment modalities on survival. In fact, several recent reports suggest that better management has improved the prognosis of patients with variceal bleeding over the past four decades<sup>[3-6]</sup>.

By contrast, the conformity of management practices with relevant guidelines in the field of portal hypertension has rarely been addressed. The few available studies<sup>[7-10]</sup>

have shown broad variability among centers and under-use of treatments designed to prevent bleeding. None of these surveys took into account the interval from bleeding onset to initial management, despite its prognostic significance<sup>[11]</sup>.

The aim of this cross-sectional survey was to analyze French management practices for digestive bleeding linked to portal hypertension in patients with cirrhosis, and to evaluate their conformity with European guidelines<sup>[2]</sup>.

## MATERIALS AND METHODS

### Patients and methods

This prospective questionnaire-based survey was conducted from 1 September to 30 November 2003 by gastroenterologists in 31 general and teaching hospitals located in five French regions (Aquitaine, Champagne-Ardenne, Pays de Loire, Picardie and Poitou-Charentes) and two counties (Oise and Val d'Oise). These seven sectors were non-randomly selected according to the following criteria: in each sector an investigator, member of the "Club Francophone d'Hypertension Portale", accepted to participate in the study and recruited all the hospitals covering the geographic area, including university and non-university hospitals. Patients were eligible if they had clinically or histologically documented cirrhosis of any cause, and if they had overt digestive bleeding related to portal hypertension presenting with hematemesis or melena. Patients were not eligible if bleeding was unrelated to portal hypertension, or if portal hypertension was not related to cirrhosis. The anonymous questionnaire included the patient's date of birth and home town, the mode of hospital admission, the interval between bleeding onset and initial management, the cause of bleeding, treatment, outcome 42 d after admission, the cause of cirrhosis, preventive measures started before and after the bleeding episode, transfer to a referral center, re-bleeding and its treatment, and complications of cirrhosis during the study period. Cirrhosis was graded on admission using the Child-Pugh score<sup>[12]</sup>. A single questionnaire was analyzed per patient, corresponding to the first bleeding event during the study period. Subsequent bleeding events were recorded but their management was not taken into account in this analysis. The study protocol was approved by the French Ethics Committee for the Treatment of Computerized Information concerning Research in Health Domain.

### Statistics analysis

Data were recorded with the Microsoft Access database. All responses to the questionnaire were controlled and validated. Statistical analyses used SAS software version 8.2. Management practices were compared with the recommendations of the last consensus conference held before the survey, namely Baveno III<sup>[2]</sup> and 95% confidence limits were calculated using the normal approximation or exact computation if not applicable. Differences in practices among the six geographic sectors (five regions and two combined counties) were analyzed with the generalized Fisher's exact test for qualitative variables, with a significance level of  $P < 0.05$ . Nonparametric Mann-Whitney test was used for quantitative variables. Bleeding

Table 1 Main characteristics of the patients

Characteristics	n = 126
Age (yr, median and range)	56 (32 to 83)
Sex (M/F)	103/23
Causes of cirrhosis [n (%)]	
- Alcoholism	101 (80%)
- Hepatitis virus (B, C)	11 (9%)
- Alcoholism plus another cause	4 (3%)
- Other causes	5 (4%)
- Unknown	5 (4%)
Child-Pugh class A/B/C (n) <sup>1</sup>	27/42/53

<sup>1</sup>Missing data: two incomplete files and two early deaths.

control was defined as hemodynamic stability, without transfusion, 48 h after admission<sup>[2]</sup>. Hemorrhagic relapse was defined as any bleeding event occurring between 48 h and 42 d after admission. Mortality was evaluated 42 d after admission. In European studies published from 1993 to 1996, the estimated incidence of upper digestive bleeding was between 45/10<sup>5</sup> and 143/10<sup>5</sup> inhabitants, depending on the country, and esogastric varice rupture accounted for 5.0% to 13.7% of cases (incidence rate 4.0/10<sup>5</sup> to 19.6/10<sup>5</sup> inhabitants)<sup>[13-15]</sup>. Thus, it was predicted that a maximum of three months would be necessary to recruit at least 100 cases in the geographic area covered by the survey.

## RESULTS

During the three-month study period, 135 patients were consecutively admitted in 31 hospitals. Nine patients were excluded from the analysis because the bleeding event was not linked to portal hypertension in 7 cases (gastric or duodenal ulcer in 5 cases, peptic esophagitis and hemorrhoidal bleeding in one case each). In the other two cases the portal hypertension was linked to hepatic metastases of breast and pancreatic primary tumors. The following analysis thus involved 126 patients.

The patients' main characteristics are shown in Table 1. Prophylaxes before admission are detailed in Table 2. Bleeding occurred at home in 100 cases (79%), and in hospitals in the other 26 cases. Forty-six patients (37%) arrived by mobile intensive care unit (MICU), either from home ( $n = 37$ ) or from another hospital unit ( $n = 9$ ). This mode of admission was evenly distributed among the participating centers ( $P = 0.18$ ). Among the 100 patients who arrived from home, the median interval between onset and hospital admission was 4 h (1 to 80 h). This interval was significantly shorter among patients transported by MICU (median 3.4 h *vs* 5.2 h;  $P = 0.049$ ). The interval was  $< 2$  h in 18 cases, 2-6 h in 27, 6-12 h in 11, 12-24 h in 19 and  $> 24$  h in 25. It did not differ between patients with first and subsequent bleeding events ( $P = 0.14$ ), or between patients with and without documented cirrhosis ( $P = 0.16$ ).

Table 3 shows the conformity to the Baveno III consensus of management practices, and their variability among the participating centers. Ninety-five of the 100

**Table 2 Previous bleeding and prophylaxis given before the index bleeding**

Prophylaxis	n (%)
First bleeding event <sup>1</sup>	79 (63)
- Cirrhosis known before admission	40/79
- Prior endoscopy	25/40
- Prophylaxis before admission:	16/25
Esophageal varices stage 0-1:	0/7
Esophageal varices stage 2-3:	16/18
• Beta-blockade	12
• Ligation	2
• Ligation and beta-blockade	2
Recurrent bleeding	46 (37)
- Prophylaxis before admission:	
• None <sup>2</sup>	11 (24)
• Sclerosis	2 (4)
• Ligation	4 (9)
• Beta-blockade	13 (28)
• Ligation/sclerosis plus beta-blockade/nitrate derivative	16 (35)

<sup>1</sup>Missing data: one death shortly after admission; <sup>2</sup>Cirrhosis had not been diagnosed at the time of the previous hemorrhage in three patients.

patients who were admitted from home, underwent an endoscopy. The median interval between admission and endoscopy was 5 h ( $< 1-139$  h), and was less than 12 h in 60% of cases. This interval was not influenced by blood transfusion ( $P = 0.09$ ), the bleeding history ( $P = 0.78$ ), or previously documented cirrhosis ( $P = 0.29$ ). The median interval was 10 h when admission occurred between 10 PM and 7 AM, 4 h between 7 AM and 5 PM, and 13 h between 5 PM and 10 PM. Bleeding was due to esophageal varices in 89 cases (72%), gastric or ectopic varices in 13 cases (11%), and gastropathy linked to portal hypertension in 6 cases (5%); in 15 cases (12%) the endoscopy revealed mixed lesions combining occasionally erosive gastritis and signs of a possible variceal origin. Five of the 6 patients in whom bleeding was due to gastropathy alone received a vasoactive drug. Vasoactive drug therapy consisted mainly of octreotide (93% of cases); terlipressine was used alone in 6 cases and somatostatin in 2 cases. The use of vasoactive drugs did not differ among the geographic sectors ( $P = 0.08$ ). The drugs were administered within a median of 2 h after admission ( $< 6$  h in 66% of cases), for a mean of three days (1 to 6 d). None of the patients received emergency transjugular intrahepatic portosystemic shunting (TIPS), and a balloon tamponade was inserted in 8 (6%) patients. Tracheal intubation was performed in only 21 cases (17%), usually to facilitate an endoscopy ( $n = 11$ ); this practice differed significantly among the geographic sectors (0 to 54%,  $P < 0.0001$ ). Nasogastric tube was used in 57 patients (46%), usually for gastric lavage before an endoscopy (significant difference among geographic sectors; 25% to 86%,  $P = 0.0002$ ). Data concerning antibiotics and lactulose prescription are given in Table 3.

Bleeding was controlled within 48 h after admission in 99 patients (80%). Twenty-one patients re-bleed, a median of 16 d (d 3 to 40) after admission; they usually received a combination of endoscopic treatment and vasoactive drugs. TIPS was used in four patients, and one patient had a surgical portocaval anastomosis. Five patients were

transferred to a referral center. In 94 patients evaluable, after exclusion of deaths, the main prophylactic treatments were a combination of beta-blockade and ligation in 31 patients, beta-blockade alone in 29 patients, ligation alone in 18 patients, endoscopic sclerosis in 4 patients and 3 patients received no prophylaxis. Prescription of beta-blockade, alone or in combination, was significantly different among geographic sectors ( $P = 0.003$ ).

Outcome on d 42 was unavailable in 9 cases. Ninety-one (78%) were alive on d 42. Six of the 26 deaths occurred in the first 48 h. The main causes of death were hemorrhage, liver failure, multiorgan failure, shock, and hepatorenal syndrome. Fifteen patients had hepatocellular carcinoma, and three of them died before d 42. The main in-hospital complications were hepatic encephalopathy ( $n = 14$ ), hepatorenal syndrome ( $n = 6$ ), and bacterial infections ( $n = 7$ ).

## DISCUSSION

This survey shows that the management of digestive bleeding in cirrhotic patients in France generally complies with the Baveno III international consensus statement issued three years ago. However, certain practices differed among the participating centers, and some recommendations should be applied more systematically. This is not surprising since many practitioners are involved in the management of cirrhotic patients and most of them are not hepatology experts. Our study was not designed to compare the outcomes of patients according to the physician's compliance with the recommendations. In our study, the outcome was as favorable as in recent publications<sup>[4,5]</sup>. However, improvement in mortality has rarely been observed in randomized trials, and this benefit was demonstrated only in meta analysis, suggesting that many confounding factors are involved.

First bleeding events revealed the presence of cirrhosis in half the patients. One-third of the patients with a prior diagnosis of cirrhosis had not had endoscopic screening for large esophageal varices and did not therefore receive preventive therapy. Esophageal varices are of a recognized prognostic value in this setting<sup>[16,17]</sup>, and both beta-blockade<sup>[18]</sup> and endoscopic ligation<sup>[19]</sup> are known to reduce the bleeding risk. Our results are similar to those of US practice surveys. Arguedas *et al*<sup>[7]</sup> reported that only one-half of cirrhotic patients referred for liver transplantation had endoscopic screening for varices. Sorbi *et al*<sup>[8]</sup>, in a survey undertaken in 1997 in the United States, also noted that primary prophylaxis was under-used, as only 20% to 30% of patients received beta-blockade before the index bleeding event. Following the publication of the 1997 guidelines of the American Board of Gastroenterology, Zaman *et al*<sup>[10]</sup> found that 54% of gastroenterologists claimed they followed recommendations to screen for and treat large varices in patients with no history of bleeding, representing a three-fold increase compared to the same survey prior to the publication of the recommendations.

Admission to clinical centers remains too late in many cases ( $> 12$  h in nearly 40% of patients), even though the general French population is no more than one hour from a hospital. The interval between onset and initial

**Table 3** Management of the bleeding event in 126 consecutive patients: conformity with the Baveno III consensus and regional variability

Baveno III guidelines	<i>n</i> (%) of cases complying with the guidelines (95% confidence limits)	Variability among sectors (range, <i>P</i> <sup>a</sup> )
Endoscopy within 12 h after admission from home	60 (60%) (50%-70%)	52% to 71% <i>P</i> = 0.85
Blood restitution to maintain hematocrit at 25% to 30%	84 (89%) (81%-95%) ( <i>n</i> = 94 patients transfused)	ND
Early vasoactive drug infusion	110 (87%) (80%-92%) Median time after admission: 2 h	71% to 100% <i>P</i> = 0.081
Endoscopic treatment: ligation or sclerosis	- Ligation 52 (42%) (33%-51%) - Sclerosis 26 (21%) (14%-29%)	29% to 61% <i>P</i> = 0.17 7% to 43% <i>P</i> = 0.29
Antibiotic prophylaxis	81 (64%) (55%-73%) Prophylaxis 87% / infection 13%	50% to 75% <i>P</i> = 0.41
Lactulose administration	50 (40%) (32%-49%) Prophylaxis 57% / encephalopathy 43%	26% to 86% <i>P</i> = 0.041
Prophylaxis of rebleeding: beta blockers or ligation	- Beta-blockers alone 31% (22%-41%) - Ligation and beta-blockers 33% (24%-43%) - Ligation alone 19% (12%-29%) - Others or none 17% (10%-26%)	0 to 45% 16% to 100% 0 to 37% 0 to 44% <i>P</i> = 0.0003

ND: variability not assessed. <sup>a</sup>Generalized Fisher's exact test of the homogeneity in practices among the six geographic sectors (five regions and two combined counties).

management is not shorter in patients with a history of bleeding or with known cirrhosis, suggesting that they are poorly informed of the risk of variceal bleeding and the need for early hospital admission. Although overall survival in this survey was better than previous, and similar to that in recent publications<sup>[5,6]</sup>, fatal outcome is still closely related to failed bleeding control or to early rebleeding<sup>[11]</sup>. Early resuscitation is firmly recommended<sup>[20]</sup>. We recently showed that about one-quarter of deaths occur very early after bleeding onset, mainly before hospital admission<sup>[21]</sup>. Levacher *et al*<sup>[22]</sup> also reported that early terlipressin administration (en route to hospital) significantly improved the prognosis. This should be taken into account at the forthcoming consensus conferences.

Contrary to recommendations, an endoscopy was performed more than 12 h after admission in one-third of patients admitted from home in this survey. However, early use of vasoactive drug therapy in nearly all the patients, as recommended, suggests that initial bleeding control allowed an endoscopy to be deferred, particularly among patients admitted in the evenings. Conversely, one-third of patients did not receive antibiotics, which should have been routinely considered<sup>[2]</sup>. Indeed, antibiotics can prevent infections and rebleeding, and thereby improve survival<sup>[23]</sup>. In our survey, lactulose was only prescribed to about 40% of patients, and there were significant differences among the participating centers with respect to this practice. This is not surprising since the efficacy of lactulose in preventing encephalopathy has not been clearly demonstrated.

Regarding prophylactic measures, beta-blockade was extensively used for primary prevention in patients with large varices, in keeping with the consensus, however, secondary prevention in one third of patients consisted of a combination of beta-blockade and endoscopic ligation, even though this treatment had not been shown at the time

of Baveno III to be more effective than ligation or beta-blockade alone<sup>[2]</sup>. Practices differed significantly between centers regarding secondary prophylaxis, and the combined treatment was finally accepted in 2005 consensus<sup>[1]</sup>. This study was not designed to investigate the cause and origins of lack of adherence to guidelines, which is a worldwide problem. Many factors may be involved, including patient information and behavior, local organization of health care, formation of practitioners especially in non-specialized emergency units. This question needs to be addressed in the future.

In conclusion, while French practices are generally in line with the consensus statement, there is significant room for improvement in the diagnosis of cirrhosis and in primary bleeding prevention. However, these results show that cirrhotic patients are poorly informed of the clinical signs and gravity of bleeding, and of the need for rapid treatment by a specialized team. Antibiotics are under-used, and this calls for better information of physicians who manage such patients in intensive care units.

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## COMMENTS

### Background

Gastrointestinal hemorrhage is a major complication of cirrhosis. Prognosis improved over the past four decades in relation with a better management of patients with variceal bleeding. Variability and conformity of practices with relevant guidelines have rarely been addressed. Previous US practice surveys reported underuse of esophageal varices screening and primary prophylaxis with beta-blockers.

### Research frontiers

This article deals with evaluative epidemiology of medical practices. The lack of adherence to guidelines is a worldwide problem.

### Innovations and breakthroughs

Major concerns for improvement: improving the endoscopic screening of esophageal varices, patient information about the clinical signs and gravity of

bleeding, shortening the delay from bleeding to admission and endoscopy, and generalizing antibiotic prophylaxis. Lactulose administration and prophylaxis of rebleeding were highly variable practices among sectors.

### Applications

These results support the need for active promotion of international guidelines focused on information of physicians who manage such patients and encouraging them to criticize their own practice.

### Peer review

This is an interesting cross-sectional, descriptive study of treatment related to adherence to international guidelines in a French mixture of academic and non-academic hospitals. However, this work did not analyse possible causes to explain such behavior.

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