

## ORIGINAL ARTICLE

# Self Assessment of Warning Symptoms in Upper Gastrointestinal Bleeding

Felix Gundling, Rinna Thulile Harms, Ingolf Schiefke, Wolfgang Schepp, Joachim Mössner, Niels Teich

## SUMMARY

**Introduction:** Alcohol addicted patients are at increased risk of upper gastrointestinal bleeding. Delay to endoscopy is mainly determined by patients' self assessment.

**Methods:** The authors asked 417 patients with high alcohol consumption from Leipzig (n = 277) and Munich (n = 140) with an average alcohol consumption of 660 g/week about their behavior when faced with symptoms of acute upper gastrointestinal bleeding.

**Results:** 71% or 51% said they would call the emergency physician if they were to vomit blood or black liquid. Only 32% would call emergency medical aid if they were to pass black stools, and only 25% of those surveyed thought urgent medical attention necessary in any of the three scenarios. Patients with regular contact with health care providers, and women, were more likely to consider these three scenarios as medical emergencies. The authors found no differences by age, educational level, marital status and alcohol consumption.

**Discussion:** Knowledge concerning the impact of symptoms of gastrointestinal bleeding was poor, in our study. Patients with high alcohol consumption and infrequent contact with health care providers, in particular, should be informed about symptoms such as melena and hematemesis, as delayed presentation significantly affects prognosis and resource consumption.

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**Key words:** upper gastrointestinal tract hemorrhage, hematemesis, melena, self assessment, alcoholic disease

**A**lcohol can injure different areas of the upper gastrointestinal tract in different ways. For example, alcohol reduces the tone of the lower esophageal sphincter, resulting in reduced gastroesophageal clearance and increased gastroesophageal reflux. Depending on the concentration, alcohol also damages the mucosal barrier of the esophageal mucosa. Gastric acid reflux can then penetrate into and destroy the regenerative layer of the epithelial cells (1). In the stomach, alcohol causes an increase in gastric acid secretion inversely proportional to its concentration (2). This leads via complex mechanisms to mucosal damage and ultimately to hemorrhagic gastritis. Although the incidence of duodenal ulcer is elevated in alcoholic patients, several studies have failed to demonstrate any influence on the incidence of gastric ulcer (3).

Besides these phenomena explicable in purely chemical terms, alcohol is also an important carcinogen for cancers of the oral cavity, pharynx, hypopharynx, and esophagus. The most devastating effect is seen on the pharynx: with a daily alcohol intake of 100 g, the risk of pharyngeal cancer increases to 125 fold. Alcohol consumers who smoke tobacco even increase their risk to 210 fold compared to the normal population (3).

Other alcohol related hazards associated with injury to the upper gastrointestinal tract are the complications of liver cirrhosis such as portal hypertension (portal hypertensive gastropathy, esophageal and fundus variceal bleeding, or disorders of plasma coagulation and of platelet count and function).

The annual incidence of upper gastrointestinal bleeding is about 150 per 100 000; mortality is between 8% and 14% (4–6). Patients with high alcohol consumption are especially at risk of upper gastrointestinal tract bleeding and resulting death (7). An analysis of more than 220 000 natural deaths in Sweden showed that alcohol related illnesses account for 17% of total mortality. However, 29% and 47% respectively of patients who died of variceal bleeding or non-varicose upper gastrointestinal bleeding had alcoholic disease (8).

The standard form of management for upper gastrointestinal hemorrhage is immediate therapeutic esophagogastroduodenoscopy, although the guidelines offer differing recommendations regarding the optimal time frame for this examination (9). A metaanalysis of 23 studies on non-varicose upper gastrointestinal

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bleeding revealed that endoscopy performed soon after the event favorably influences transfusion requirements and length of hospital stay, but not complications and mortality (10). A further study also demonstrated a substantial cost reduction with emergency endoscopy compared to elective endoscopy (11).

The widespread use of modern hemostatic techniques has reduced mortality from upper gastrointestinal bleeding over the last few decades, especially in patients with liver cirrhosis: a French long-term study, for example, showed that the more extensive use of endoscopic rubber band ligation led to a reduction in mortality due to upper gastrointestinal bleeding from 11.7% to 7.2% ( $p = 0.03$ ) within 4 years (5). The consensus in Germany is therefore that endoscopy should be performed immediately on admission to hospital and, if necessary, cardiovascular stabilization. This approach also finds its expression in a clearly worded recommendation of the German Society for Digestive and Metabolic Diseases (DGVS, Deutsche Gesellschaft für Verdauungs- und Stoffwechselerkrankungen) (12).

The commonest symptoms of upper gastrointestinal bleeding are vomiting of (hematinized) blood and the passage of black (tarry) stools. Although no systematic studies have been performed, experience has shown that patients with high alcohol consumption who experience these symptoms often only attend an emergency admissions department or call an emergency physician after a considerable delay. This results in even heavier blood loss and frequently necessitates intensive medical monitoring and increased transfusion requirements.

The purpose of the present study was to ascertain alcoholic patients' level of knowledge about the symptoms of gastrointestinal bleeding and identify groups with particular deficits.

**Methods**

Between June 2006 and March 2007 the authors surveyed patients with high alcohol consumption regarding their behavior if faced with symptoms of acute

upper gastrointestinal bleeding. The subjects were interviewed verbally, if necessary after clinical symptoms of alcoholic withdrawal had subsided. The patients' responses were recorded on a standardized questionnaire. Regardless of the reason for admission to hospital, the authors surveyed all patients with alcoholic disease who were admitted to a general ward during the period stated.

Alcoholic disease was considered to be present if the patient was currently consuming or had a history of consuming more than 140 g (women) and 420 g (men) alcohol per week. Weekly alcohol consumption details were elicited by detailed inquiries. For this purpose the volumes of all the alcoholic beverages consumed weekly by the subjects over the previous 3 months were recorded and multiplied by the mean concentration in percent by volume (beer 5% by volume, wine 12% by volume, spirits 40% by volume). The calculated number of milliliters was multiplied by the specific gravity (0.7913 g/mL) of ethanol to obtain the amount in grams. Exclusion criteria were clinically identifiable symptoms of alcohol withdrawal, inability to communicate, or the patient's refusal to be surveyed.

The questions were: "How would you behave if you suddenly noticed the following this evening:

- black vomit
- bloody vomit
- black stools?"

The survey participants were asked to respond to the question immediately with the answer they considered correct: "wait and see," "see my general practitioner tomorrow," or "call the emergency physician today." Calling the emergency physician immediately was rated as the correct answer in all cases.

In addition, data relating to age, gender, exact weekly alcohol consumption, number of contacts with health care providers during the previous year, and family status were elicited. The authors also asked the participants whether they had completed vocational training.

The study was purely exploratory in nature. The influence of the various predictors on the patients'

**TABLE**

**Significantly different subgroups of alcoholic patients for the respective correct response (call emergency physician) to clinical signs of upper gastrointestinal bleeding**

	n	Bloody vomit	Black vomit	Black stools
Women	98	*1 78 (80%)	*1 59 (60%)	28 (29%)
Men	318	*1 219 (69%)	*1 152 (48%)	105 (33%)
Leipzig	276	*2 185 (67%)	147 (53%)	*2 103 (37%)
Munich	140	*2 112 (80%)	64 (46%)	*2 30 (21%)
0–1 physician visits (1 <sup>st</sup> quartile)	105	*2 67 (64%)	*3 41 (39%)	*3 27 (26%)
2–4 physician visits (2 <sup>nd</sup> quartile)	103	47 (45%)	65 (63%)	24 (23%)
5–12 physician visits (3 <sup>rd</sup> quartile)	147	83 (56%)	112 (76%)	49 (33%)
>12 physician visits (4 <sup>th</sup> quartile)	61	*2 53 (87%)	*3 40 (66%)	*3 33 (54%)

\*1  $p < 0.05$ ; \*2  $p < 0.01$ ; \*3  $p < 0.001$

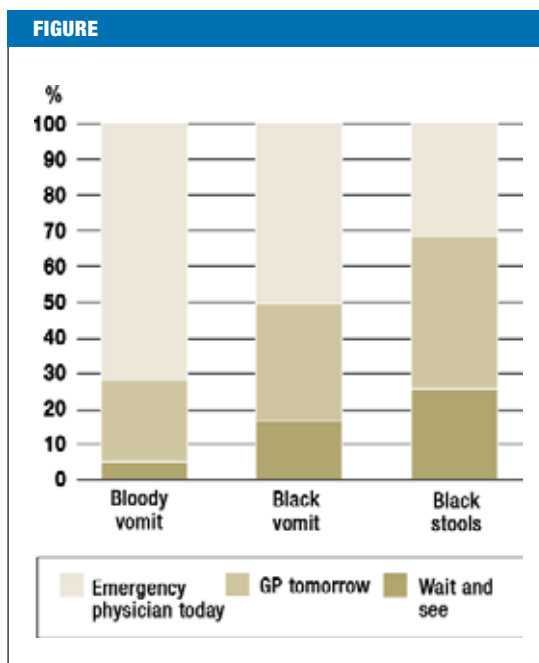
response was analyzed univariately by chi-square test or Mann-Whitney U test. The multivariate evaluation of the predictors was performed by logistic regression analysis. The patient's response (emergency physician yes or no) was used as a dependent variable. Independent variables were the town/city, age, gender, family status, educational level, and quantity of alcohol consumed. Statistical significance was assumed at  $p < 0.05$ .

### Results

The authors surveyed 417 patients with high alcohol consumption (98 women, 319 men; median age 51, range: 18 to 82 years) from Leipzig (n = 276, 51 women, 225 men) and Munich (n = 140, 47 women, 93 men) with a mean weekly alcohol consumption of 660 g (interquartile interval 276 g to 1023 g). The first quartile also contained 30 patients with high alcohol consumption (7%) who were abstinent at the time of the survey. 109 of the survey sample (26%) had participated at least once in an alcohol withdrawal program. 12 further patients refused to participate in the survey (3%). In view of the alcohol quantities documented in the medical histories the authors assume that the survey subjects were predominantly alcoholic patients; an exact diagnosis based on the symptoms in ICD10 or DSM4, however, was not made. The main hospital diagnosis was also not recorded. When the medical histories were taken, however, 219 (52.5%) and 104 (24.9%) patients respectively stated that they had a previous diagnosis of liver cirrhosis or chronic pancreatitis. 10 patients (2.4%) reported that they were suffering from both diseases. 15 patients (3.6%) had experienced an epileptic seizure in the past. 43 patients (10.3%) were not found to have a history of alcohol related disease. The remaining 26 patients (6.2%) had only partial recollection of their medical history.

Hematemesis was recorded as the most alarming symptom: 71% of the survey sample stated they would call an emergency physician immediately if they had this symptom (*figure*). Gender (women more frequently gave correct answers), place of residence, and physician attendance rate were significant influencing factors in both the univariate and multivariate analysis (*table, e-table*). Awareness of the hazard represented by black vomit and tarry stools was much poorer; in these cases only one half and one third of the sample respectively would seek immediate medical assistance (*figure*). The annual number of contacts with health care providers was a significant influencing variable for both target criteria in the multivariate analyses. Only 106 patients (25%) answered all three questions correctly.

The *table* presents further significant differences from subgroup analyses: women would be more inclined than men to call an emergency physician both for black and bloody vomit ( $p < 0.05$ ). The advantage of the Leipzig patients resulting from their correct response to bloody vomit was nullified by their underestimation of the symptom "tarry stool"; overall, therefore, there seems to be no substantial difference



Cumulative frequencies of responses to the question "How would you behave if you suddenly noticed the following this evening: black vomit, bloody vomit, black stools?" The difference between the correct responses to the three questions was significant in each case ( $p < 0.001$ ). GP, general practitioner

between alcoholic patients in East and West Germany. The differences in awareness were most evident when considered in relation to the number of contacts with health care providers during the previous year: especially for the less conspicuous hemorrhagic symptoms melena and vomiting of hematin, marked differences were observed in the responses in favor of patients with frequent physician contacts. The factors age, family status, weekly alcohol consumption, and completed vocational training did not have differing effects (see *box* and *e-figures 1-3*).

### Discussion

The survey provides evidence that patients with alcoholic disease are insufficiently aware of the significance of potential symptoms of upper gastrointestinal bleeding. This applies both to obvious symptoms like hematemesis and to less conspicuous symptoms such as vomiting of hematin or passage of tarry stools. Only one quarter of the survey sample regarded all three symptoms as representing a need for urgent action. As expected, hematemesis was attributed the greatest importance.

Awareness of the significance of melena as a symptom to be taken seriously was particularly lacking: even in the best-informed group of patients with at least 12 contacts with health care providers during the previous year, only every second subject would call the emergency physician immediately. This association could indicate that close doctor-patient relationships could be associated with repeated education

about warning symptoms. It was not examined whether the patients in this group, because of their assumed higher morbidity, had already suffered gastrointestinal bleeding more often than patients with rare contacts with health care professionals. A difference of this kind could exert an influence on the higher rate of correct estimation of bleeding symptoms in this group.

Whether the data surveyed yield a more positive picture on practical confrontation with the theoretical emergency scenarios described cannot be demonstrated with the methodology used. The disadvantage of the study lies in its theoretical nature. The scenario was designed in open terms and is not completely specific for life-threatening gastrointestinal bleeding. Symptoms such as vomiting of previously drunk coffee or the frequently very dark coloration of stools following consumption of bilberries are also covered by the description. The inclusion of more precise details in the description, however, would have made answering the questions too simple. Similarly, the survey did not include a reference group of same-gender persons without alcohol consumption; possibly, awareness may be no better in the general population. The data surveyed are to be regarded as non-representative on account of the patient selection: only patients with high alcohol consumption admitted to a general ward in two German cities were studied.

While the self assessment of recently consumed quantities of alcohol – e.g., directly before a traffic accident – correlates well with the levels of alcohol measured in the blood (13), the results of numerous population based surveys of chronic alcohol consumption are markedly below the amounts of alcohol sold in the same region. In one of the largest studies on this subject, the "Finnish Drinking Habit Survey" of 1992, the inhabitants of a region underestimated their actual alcohol consumption by 43% (14–15).

Women tend more to understatement than men in this respect, and the consumption of spirits is much more seriously underestimated than that of beer and wine (16). Although the authors applied internationally recommended standards when structuring the interview (17), the alcohol quantities reported by the persons concerned can only be regarded as a general indicator of the individual extent of alcohol consumption. Interestingly however, no differences were found between the survey subjects with the lowest and those with the highest weekly alcohol consumption in terms of their response to clinical signs of upper gastrointestinal bleeding.

### Conclusion

Patients with high alcohol consumption are a high risk population for upper gastrointestinal bleeding. Nevertheless, their awareness of how to respond correctly to hematemesis and melena is very poor. Women and patients with more than 12 contacts with health care providers during the previous year were among the best-informed subjects. Especially patients with high

### BOX

#### Factors unimportant for an adequate response

Not significantly different subgroups of alcoholic patients for the respective correct response (call emergency physician) to clinical signs of upper gastrointestinal bleeding

- First age quartile (<43 years) versus fourth age quartile (>61 years)
- First quartile (<277 g) versus fourth quartile (>1023 g) of weekly alcohol consumption
- None versus completed vocational training
- Married versus unmarried (single, divorced, widowed)

alcohol consumption and rare contacts with health care providers should be informed about the significance of the warning symptoms melena and hematemesis by their general practitioner, the gastroenterologist coresponsible for their treatment and by the colleagues in the psychosocial disciplines involved in their management. Every time delay caused by the patient has a major impact on prognosis and consumption of resources.

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#### Conflict of interest statement

The authors declare that no conflict of interest exists according to the guidelines of the International Committee of Medical Journal Editors.

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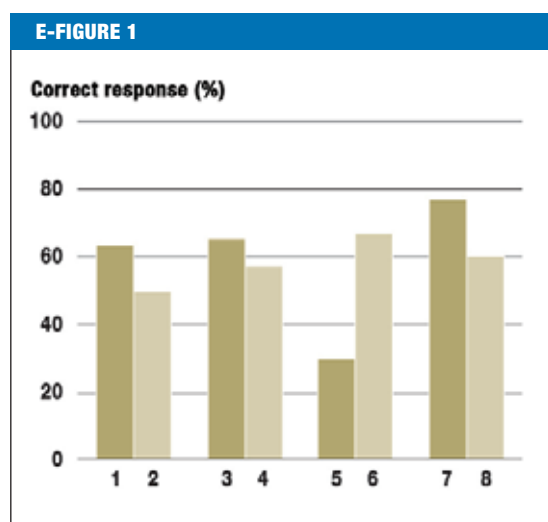


For e-diagrams and e-table please see:  
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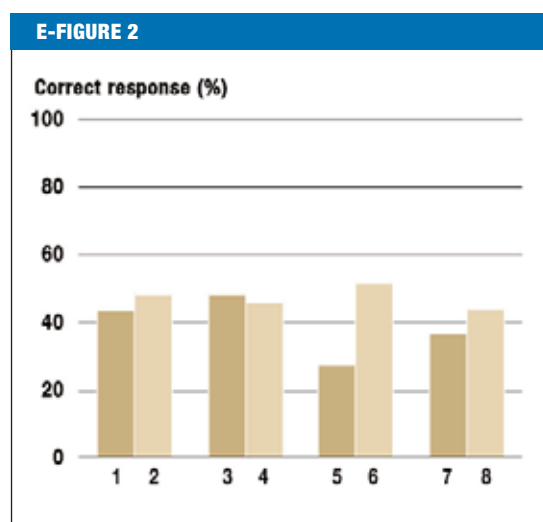
E-FIGURES

# Self Assessment of Warning Symptoms in Upper Gastrointestinal Bleeding

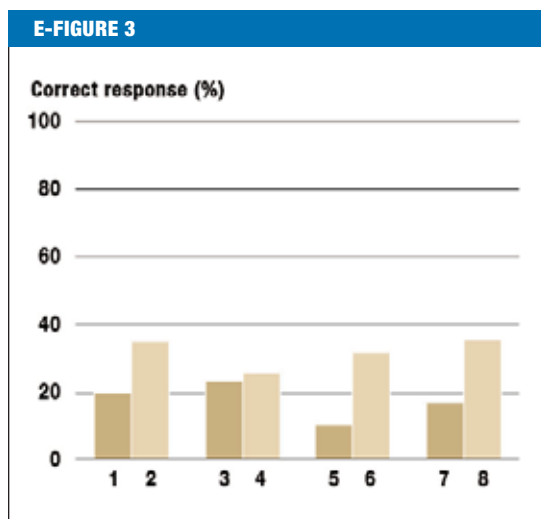
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Response to bloody vomit



Response to black vomit



Response to black stools

E-TABLE

# Self Assessment of Warning Symptoms in Upper Gastrointestinal Bleeding

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E-TABLE							
Dependence of outcome variables on the characteristics of the survey participants (p values)							
Influencing factor	Physician visits	Residence	Gender	Age	Alcohol (g/week)	Education	Family status
<b>Symptom</b>							
Vomiting of hematin	<0.001	0.146	0.032	0.924	0.397	0.070	0.078
Hematemesis	0.002	0.006	0.040	0.288	0.087	0.408	0.441
Melena	<0.001	0.001	0.410	0.107	0.929	0.059	0.056
<b>Outcome variable hematemesis</b>							
	<b>Wald's p value</b>	<b>OR</b>	<b>95% confidence interval</b>				
Physician visits	0.005	1.047	1.014–1.082				
Residence	0.011	1.899	1.158–3.113				
Gender	0.132	0.650	0.371–1.138				
<b>Outcome variable melena</b>							
Physician visits	<0.001	1.058	1.030–1.086				
Residence	0.002	0.462	0.285–0.747				
<b>Outcome variable hematin</b>							
Physician visits	0.002	1.041	1.014–1.068				
Gender	0.042	0.617	0.388–0.984				