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A survey of emergency medicine physicians' knowledge, attitude, and practice towards esophagogastric variceal bleeding

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Abstract

Background Esophageal-gastric variceal bleeding (EVB) is one of the leading causes of mortality in patients with cirrhotic portal hypertension. Rapid, accurate, and effective emergency care is crucial for successful patient outcomes.

Aims This study aims to evaluate the knowledge, attitudes, and practices of Chinese emergency physicians regarding EVB, with the goal of improving the diagnosis and treatment of gastrointestinal bleeding in emergency settings.

Methods A self-designed questionnaire based on clinical guidelines was developed to assess EVB knowledge, attitudes, and practices of Chinese emergency physicians in treating EVB. An online survey was conducted among emergency physicians nationwide. Data were analyzed using descriptive statistics and correlation analysis.

Results The knowledge score for EVB was 11.2 ± 3.5 (total score was 22), indicating a relatively low level of understanding. Statistically significant differences in knowledge scores were observed across hospital grades, educational backgrounds, years of experience, professional titles, and participation in relevant training programs (P < 0.05). The mean attitude score for EVB was above 4 (total score was 5), reflecting a generally positive attitude among physicians. In terms of practices, the score for treatment behavior of EVB was 2.7 ± 1.2 , and behavior was positively correlated with knowledge and attitude (P < 0.05).

Conclusion Chinese emergency physicians demonstrate a low level of knowledge about EVB treatment, although their attitudes remain positive. Their clinical practices in EVB management are also insufficient. Enhancing education on EVB and standardizing treatment protocols are necessary to improve patient outcomes.

Keywords Emergency physicians, Esophagogastric variceal bleeding, Knowledge, Attitude, Practice

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Introduction

Acute upper gastrointestinal bleeding (UGIB) is one of the most common and life-threatening medical emergencies worldwide, with the annual incidence ranging from 100 to 180 per 100,000 individuals per year, and the mortality is between 2% and 10% [1, 2]. Patients presenting with UGIB, especially those experiencing massive bleeding, are often first seen in emergency departments. Without timely and effective intervention, these patients face significant risks, including hemodynamic instability, shock, and death, emphasizing the need for accurate, rapid, and standardized diagnostic and treatment strategies [3, 4].

Among the causes of UGIB, portal hypertensionrelated esophagogastric variceal bleeding (EVB) is particularly challenging due to its high recurrence and mortality rates [5]. Portal hypertension, most commonly resulting from liver cirrhosis, elevates pressure in the portal venous system and leads to complications such as ascites, esophageal and gastric varices, hepatic encephalopathy, and EVB [6, 7]. Despite advances in medical care, the six-week mortality rate for EVB remains as high as 15–20% [8–10]. Therefore, the implementation of active and effective therapeutic interventions is crucial for mitigating the risk of EVB rebleeding and reducing associated mortality [7].

Globally, guidelines recommend an integrated approach to EVB management, combining endoscopic techniques, vasoactive drugs, and prophylactic antibiotics to achieve hemostasis and prevent complications [11–13]. However, adherence to these guidelines varies significantly across regions, often influenced by the availability of resources, the level of physician training, and institutional practices [12, 14, 15]. In developed countries, timely access to endoscopy is a cornerstone of EVB management, with success rates exceeding 90% in controlling active bleeding. In contrast, developing countries face challenges such as delayed diagnosis, limited access to endoscopy, and inconsistent use of guideline-recommended therapies, contributing to poorer outcomes [14, 16-18].

Emergency physicians play a pivotal role in the initial stabilization and management of patients with EVB, yet their knowledge, attitudes, and practices (KAP) regarding the condition remain poorly understood. A few studies in Western countries have explored physician compliance with management protocols for UGIB and EVB, revealing gaps in knowledge and variations in practice [15, 19, 20]. However, there is a lack of large-scale, representative surveys addressing the KAP of emergency physicians in developing countries like China, where the prevalence of liver disease and its complications poses a significant public health burden.

To address this gap, this study aimed to evaluate the knowledge, attitudes, and practices of emergency physicians across China regarding EVB. By identifying deficiencies and variability in their approach to EVB management, the findings of this study seek to provide evidence for targeted education, enhanced training, and the standardization of first aid practices for upper gastrointestinal bleeding, ultimately improving patient outcomes.

Materials and methods Survey method

A convenience sampling method was employed to conduct an electronic questionnaire survey via the WeChat platform from January 1, 2022, to December 1, 2022. The survey targeted emergency medical personnel from 26 provinces and municipalities across China. Participants were randomly selected from regions accessible within the study's scope. To ensure that the findings accurately reflected the perspectives and experiences of professionals directly involved in emergency care, healthcare workers from non-emergency departments were excluded. Informed consent was obtained from all respondents prior to their participation.

Survey content

The questionnaire was developed based on existing guidelines. It was reviewed by eight clinical experts, achieving a Content Validity Index (CVI) of 0.97. The test-retest reliability of 20 samples was 0.90. The questionnaire comprised four sections: (1) Demographic data, including hospital level, age, years of experience, position, educational background, professional title, and participation in training or lectures on gastrointestinal bleeding; (2) Knowledge related to EVB treatment, including basic theoretical knowledge and treatment methods; (3) Attitudes towards EVB treatment, assessed through four items rated on a scale of 1 to 5 (total score = 5); (4) Practices related to EVB treatment, including drug therapy, endoscopy, blood transfusion, and other related procedures.

Scoring criteria for the questionnaire

The questionnaire employed a standardized scoring system to evaluate knowledge, attitudes, and practices related to EVB. Knowledge assessment was based on a binary scoring method, with each correct response awarded 1 point and incorrect or unanswered responses scored as 0. The cumulative score reflected the respondent's overall level of EVB knowledge, with higher scores indicating better understanding. Attitudes toward EVB were measured using a 5-point Likert scale for each item, ranging from 1 (strongly disagree) to 5 (strongly agree), with total scores derived by summing all item

Table 1 Basic information of 1846 emergency physicians

General information	Category	Statistics n(%)
Hospital [n(%)]	Grade A tertiary	1304(70.64)
	Below Grade A tertiary	542(29.36)
Age (x±s)		37.39 ± 7.57
Work seniority(x±s)	Less than 10 years	871(47.18)
	10 years and above	975(52.82)
Degree[n(%)]	Below master	884(47.89)
	Master and above	962(52.11)
Professional title[n(%)]	Junior	588(31.85)
	Intermediate	743(40.25)
	Deputy senior	374(20.26)
	Senior	141(7.64)
Participated in training[n(%)]	Yes	1431(77.52)
	No	415(22.48)

responses. For pharmacological treatment practices, the questionnaire included five items, each scored as 1 point for correct responses and 0 for incorrect or unanswered responses. The total score provided an index of proficiency in pharmacological treatment, with higher scores representing better adherence to recommended practices.

Statistical methods

Data were analyzed using SPSS 23.0. Categorical data were presented as n (%). Continuous data were presented as mean \pm standard deviation (X \pm S), with t-tests employed. Correlation analysis was performed using Pearson's test, with a significance threshold set at P < 0.05.

Results

General information

A total of 1,879 questionnaires were collected, with 1,846 valid responses obtained after excluding those with significant missing data or logical inconsistencies, resulting in a validity rate of 98.2%. The respondents were emergency physicians from 26 provinces across China, with the majority working in Grade A tertiary hospitals. A significant portion of participants had over 10 years of experience, and more than half held a master's degree or higher. Professional titles were diverse, with many holding junior, intermediate, or senior positions. Additionally, a large proportion of physicians had received specialized training in gastrointestinal bleeding, while a smaller group had not (Table 1 and Supplementary Fig. 1).

EVB treatment knowledge

The survey revealed that emergency physicians had an average score of 11.2 ± 3.5 points out of a possible 22 on EBV knowledge, indicating relatively low overall knowledge (Table 2). Physicians working in Grade A tertiary hospitals, those with more than 10 years of experience, higher professional titles, and those who had received

ltem	Hospital			Degree			Work senio	ority		Professional tit	tle		Participate	ed in training	D
	Grade A tertiary	Below Grade A tertiary	F	Below master	Master and above	н	Less than 10 years	10 years and above	F	Junior or Intermediate	Deputy senior or renior	н	Yes	^o N	F
Total grade	11.4±3.4	10.4±3.6	5.5 ⁰	10.7 ± 3.5	11.5 ± 3.5	-4.6 [®]	10.7 ± 3.4	11.6±3.6	-53	10.9±3.5	11.7±3.6	-4®	11.4±3.5	10.3±3.4	5.4 [®]
Basic theoretical knowledge	2.8±1.2	2.4±1.2	2.5 ⁰	2.7±1.2	2.8±1.2	-1.8	2.6±1.2	2.9±1.2	-4.9 [®]	2.7±1.2	2.9±1.2	⊕	2.8±1.2	2.6±1.2	2.8 [®]
Endoscopy	2.4±1.1	2.4±1	6.0	2.4±1.1	2.4±1.1	0.4	2.3±1.1	2.5 ± 1.1	-4.6 [®]	2.4±1.1	2.4±1.1	- 3.4 ®	2.5 ± 1.1	2.4±1.1	1.5
Drug therapy	3.9±1.6	3.4±1.6	5.3 ⁰	3.5 ± 1.6	3.9±1.6	-5.4 [©]	3.6±1.6	3.9±1.7	-4.1 [®]	3.7±1.6	4 ± 1.7	-3.9 [®]	3.8±1.6	3.4±1.6	5.1 [®]
Note: Compared wi	ith "Grade A t	ertiarv". @P <	0.05:Con	npared with "B	selow master".		Compared with	"Less than 1() vears". 3 /	$^{\rm p}$ < 0.05: Compared v	vith "Junior o	r Intermedi	ate". @ P < 0.05:	Compared wi	th "Yes".

3 P < 0.05</p>

 Table 2
 Analysis of EVB knowledge questionnaire

Table 3 Results of EVB drug treatment knowledge questionnaire

Knowledge entries	Number of correct	Aware- ness
	answers	rate
Characteristics of portal hypertension bleeding	1654	89.6%
What are the drugs for EVB	640	34.7%
According to the recommendations of the guidelines, for acute EVB, terlipressin is a first-line treatment drug, and the course of treatment is	914	49.5%
Octreotide works quickly, and effectively reduces the internal pressure of varicose veins within 1 min	384	20.8%

specialized gastrointestinal bleeding training demonstrated significantly higher knowledge levels compared to their counterparts working in lower-grade hospitals, with less than 10 years of experience, junior and intermediate titles, and those without relevant training (p < 0.05, Table 2).

The average score for basic theoretical knowledge was 2.8 ± 1.2 out of 7. Most physicians (84%) identified gastrointestinal ulcers as the primary cause of upper gastrointestinal bleeding (UGIB), and 89.6% recognized the rapid onset of esophagogastric variceal bleeding (EVB) leading to shock (Table 3). Additionally, 74.4% knew that replenishing blood volume is critical in shock from massive EVB. However, only 58.2% understood that a shock index > 1.5 indicates severe bleeding. Physicians from Grade A tertiary hospitals, with more experience and relevant training, performed significantly better (P < 0.05).

The average score for endoscopic treatment knowledge was 2.4 ± 1.1 out of 4. Only 52.7% recognized endoscopy as the gold standard for diagnosing EVB. Additionally, only 41.5% knew that a hemoglobin level below 60 g/L is not a contraindication for endoscopy, and 48.4% were aware that endoscopy should be performed within 24 h of bleeding onset in patients with EVB. Furthermore, 62.5% knew that combined drug and endoscopic treatment could prevent rebleeding in emergency EVB cases, with treatment ideally initiated 7 days after controlling esophageal or gastric variceal bleeding. More experienced physicians and those with senior titles or specialized training showed better knowledge (P < 0.05).

The total score for pharmacological treatment knowledge was 8 points, with an average score of 3.7 ± 1.6 . Only 40.6% of physicians correctly identified pharmacological treatment as the first-line therapy for acute EVB. Furthermore, just 50.1% were aware that elevating gastric pH above 6 is crucial in managing non-variceal EVB. For drugs used in the management of EVB, 92.4% were familiar with somatostatin and its analogs, 87.2% recognized vasopressin, and 44% knew about antibiotic use. However, only 20.8% understood that somatostatin and its analogs can rapidly reduce variceal pressure within 1 min, and only 49.5% were aware that vasopressin therapy should be administered for 3–5 days (Table 3).

With regard to transfusion practices, only 43.3% of physicians correctly identified the indications for blood transfusion in cases of gastrointestinal bleeding. Awareness of specific treatment measures for acute EVB was 62.4%, while knowledge of transjugular intrahepatic portosystemic shunt (TIPS) as a treatment option for liver cirrhosis and portal hypertension-related EVB was limited, with only 16.4% of physicians being aware of its use.

EVB treatment-related attitudes

The mean overall attitude score was 4.6 (total score = 5), indicating a generally positive attitude towards EVB treatment (Table 4 and Supplementary Fig. 2). Physicians emphasized the importance of identifying the cause of gastrointestinal bleeding, selecting appropriate drugs based on etiology, and continuously updating their knowledge. Attitudes were significantly more positive among physicians working in Grade A tertiary hospitals, with more than 10 years of experience, and holding senior titles, as well as those who had undergone relevant training (p < 0.05).

EVB treatment practice

The survey showed that the average score was 2.7 ± 1.2 (total score = 5) in this part. Less than 50% of physicians correctly utilized antibiotics, somatostatin (octreotide), and terlipressin in EVB treatment. Notably, among the respondents, 4.6% of hospitals did not have somatostatin (octreotide) available, and 19.3% lacked vasopressin and its analogs. Regarding endoscopic treatment, 73.2% of

Table 4 EVB treatment attitude questionnaire results (n = 1846) (n, %)

Item	Score	Very disagree(1)	A little disagree(2)	General(3)	A little agreed(4)	Strongly agree(5)
It is important for follow-up treatment to find the cause of upper gastrointestinal bleeding	4.7	36(1.9)	20(1)	80(4.3)	222(12)	1488(80.5)
Different drugs should be selected according to different causes for upper gastrointestinal bleeding	4.5	31(1.6)	36(1.9)	161(8.7)	364(19.7)	1254(67.9)
Rich knowledge of upper gastrointestinal bleeding is helpful for your work	4.7	21(1.1)	12(0.6)	120(6.5)	266(14.4)	1427(77.3)
Knowledge of upper gastrointestinal bleeding among medical staff should be strengthened	4.7	18(0.9)	18(0.9)	105(5.6)	268(14.5)	1437(77.8)

hospitals could perform endoscopy within 24 h, but only 21.8% could do so within 3 h. In terms of blood transfusion, 9.4% of hospitals could initiate transfusion within 10 min, 14.9% within 20 min, 41.3% within 30 min, and 31.2% within 40 min. When EVB was suspected, 13.5% of physicians opted for balloon tamponade immediately, 27.6% after administering vasoactive drugs, 26.8% when both drug therapy and endoscopy were ineffective, and 32% of hospitals did not use balloon tamponade at all.

Discussion

Esophagogastric variceal bleeding (EVB) is a life-threatening emergency characterized by its rapid progression and high mortality rates. Our study surveyed 1,846 emergency physicians across 26 provinces in China, achieving a high response rate of 98.2%, which enhances the generalizability of the findings and minimizes non-response bias. The results provide a comprehensive overview of the knowledge, attitudes, and practices (KAP) of emergency physicians in managing EVB in China. The findings reveal that although the majority of emergency physicians (89.6%) are aware of the acute nature and severity of EVB, significant gaps exist in their knowledge of evidence-based treatments. For instance, the appropriate use of pharmacological agents such as somatostatin, vasopressin, and balloon tamponade remain suboptimal. These gaps are more pronounced among physicians in non-tertiary hospitals, those with less than 10 years of experience, and those who have not participated in specialized training (Table 2). Similar patterns have been observed in international studies, where knowledge deficits and resource limitations hinder adherence to treatment guidelines [21-25]. These findings emphasize the urgent need for targeted educational programs and standardized protocols to bridge these gaps across healthcare facilities in China.

While the study highlights generally positive attitudes towards EVB management, it also underscores the inconsistencies in translating these attitudes into clinical practice. Although most physicians emphasized the importance of identifying the etiology of gastrointestinal bleeding and tailoring treatment accordingly, less than half demonstrated appropriate use of key interventions, such as somatostatin, terlipressin, and endoscopic techniques. This discrepancy between theoretical knowledge and practical implementation reflects a systemic challenge observed in both domestic and global healthcare settings [25, 26].

In comparison to studies conducted in developed countries, our results highlight the need for structural improvements within the Chinese healthcare system [24, 25, 27]. Variations in training quality, resource availability, and healthcare infrastructure likely contribute to the observed discrepancies. Addressing these issues through targeted training, improved resource allocation, and the establishment of standardized treatment protocols will be critical for enhancing the management of EVB in China.

Our study boasts several notable strengths, including a large sample size, nationwide representativeness, and the use of a validated questionnaire. These factors collectively enhance the robustness and reliability of the data. Nonetheless, several limitations should be acknowledged. First, the self-reported nature of the survey may introduce reporting biases. Second, the cross-sectional design precludes the establishment of causal relationships. Additionally, while the study's broad scope provides comprehensive insights, it may limit the granularity of subgroup analyses. Finally, the absence of longitudinal follow-up restricts the ability to evaluate the long-term effects of interventions. Unanswered questions remain regarding the effectiveness of educational interventions in improving knowledge and practices, as well as the long-term outcomes for patients managed by physicians with varying levels of expertise. Future research should focus on developing and evaluating targeted training programs, implementing standardized protocols, and conducting longitudinal studies to assess the sustainability of these improvements over time.

In conclusion, our study highlights significant gaps in the knowledge and practice of EVB management among emergency physicians in China, despite generally positive attitudes. Bridging these gaps through enhanced education, standardization of treatment protocols, and improved access to critical resources is essential for reducing EVB-related mortality and improving patient outcomes.

Supplementary Information

The online version contains supplementary material available at https://doi.or g/10.1186/s12245-025-00849-9.

Supplementary Material 1

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Author contributions

Y.G. (Yusong Gao), S.M. (Shuai Ma), T.Z. (Tianpeng Zhang), J.W. (Junyuan Wu), S.G. (Shubin Guo) designed the survey questionnaire and led the data collection process. Z.G. (Zhenzhen Gao) analyzed the collected data and wrote the main manuscript text. X.M. (Xue Mei) reviewed and proofread the manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The study received approval from Capital Medical University and Peking university first hospital (2022-KE-620). A cover letter was attached to all questionnaire forms, explaining the study's purpose and explicitly assuring participants of their anonymity and confidentiality. Written informed consent was obtained from all participants.

Competing interests

The authors declare no competing interests.

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