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# A Comparative Study of Variceal and Nonvariceal Upper Gastrointestinal Bleeding: A Prospective Study

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**Abstract:** ***This prospective study analyzed 320 patients with upper gastrointestinal bleeding (UGIB) to compare variceal (VUGIB) and nonvariceal (NVUGIB) cases. No significant sex - based differences were found (p=0.6), but the mean age of NVUGIB patients was significantly higher (p=0.01). While hematemesis and melena were similar between groups, rectal bleeding, hematemesis with rectal bleeding, and chronic anemia were significantly different (p=0.007, p=0.02, and p=0.01, respectively). Endoscopic findings indicated that cirrhosis was more common in VUGIB patients (95.48% vs.12.72%, p<0.0001), whereas NSAID use was higher in NVUGIB patients (46.66% vs.0%, p<0.0001). The clinical outcomes, including discharge and rebleeding rates, were not significantly different (p=0.13). These findings highlight the need for early identification and targeted management of high - risk UGIB patients.***

**Keywords:** Upper gastrointestinal hemorrhage, endoscopy, cirrhosis, NSAIDs, gastroenterology

## 1. Introduction

Acute upper gastrointestinal bleeding (UGIB) is a typical medical emergency, with an incidence of 84 to 160 cases per 100, 000 individuals and a mortality rate of approximately 10%[1, 2]. Despite advancements in endoscopic therapies and pharmacological management, UGIB remains associated with high mortality, morbidity, and significant medical costs[3 - 5]. UGIB remains a significant cause of hospital admission. Several risk factors have been studied to stratify patients according to the risk of complications, such as rebleeding or death, and to predict the need for rapid clinical intervention[6]. Pre - endoscopic management in the emergency room is mainly targeted toward volume resuscitation and empirical treatment for the etiological suspected of bleeding. Guidelines recommend treatment with vasoactive agents for variceal upper gastrointestinal bleeding (VUGIB) and a high - dose proton pump inhibitor for non - variceal upper gastrointestinal bleeding (NVUGIB) while waiting for endoscopy[7, 8]. It is hard to predict the cause, yet the clinicians must distinguish between them based on clinical history, examination, risk factors, and laboratory findings and start with the empirical treatment which could help in decreasing overall mortality.

This study provides crucial insights into the differences in clinical presentation, risk factors, and management of variceal and non - variceal UGIB, enabling better treatment strategies and resource allocation in hospitals.

### Aims

To compare between variceal upper gastrointestinal bleeding and nonvariceal upper gastrointestinal bleeding in Hepato - Gastroenterology Department at Cambodia - China Friendship Preah Kossamak Hospital.

### Objectives

- To Inference the different epidemiology, the clinical presentation of variceal and nonvariceal upper gastrointestinal bleeding.
- To measure the risk factors of variceal and nonvariceal upper gastrointestinal bleeding.
- To evaluate the management outcomes of variceal and nonvariceal upper gastrointestinal bleeding.

## 2. Materials and Methods

The present study was carried out in the department of Hepato - Gastroenterology, Cambodia - China Friendship Presh

Kossamak Hospital. This prospective study included 320 patients admitted between January 1 and December 31, 2023. The data were analyzed using the proportion percentage, standard deviation (SD) or median, depending on the variable distribution. Statistical presentation and analysis were performed using Excel 365. Differences between the two groups with continuous data were assessed using a chi - square test, a Z test. A two - sided p - value of less than 0.05 was considered statistically significant.

**Inclusion Criteria**

- Age over or equal to 18 years, both sexes.
- Patient with gastrointestinal bleeding (hematemesis and/or melena, hematemesis and/or hematochezia/rectal bleeding, chronic anemia).
- Gastroscopy underwent significant origin esophago - gastro - duodenal.

**Exclusion Criteria**

- Gastroscopy underwent not to significant origin esophago - gastro - duodenal.
- Patient's re - hospitalization.

## 3. Results

**Baseline Characteristics Included Patients**

A total of 320 patients with upper gastrointestinal bleeding (UGIB) were analyzed. Among them, 225 were male (70.31%) and 95 were female (29.69%), with a sex ratio of 2.3: 1. The mean age of the patients was 57.03 ± 12.24 years, with the majority being between 40–65 years old (68.12%). Patients aged below 40 years constituted 10.00%, while those above 65 years made up 21.87%.

Most patients were from provincial regions (81.25%), with only 18.75% from Phnom Penh. In terms of bleeding manifestations, hematemesis and melena were the most common presentation (49.06%), followed by melena alone (22.50%) and hematemesis (19.06%). Less common presentations included rectal bleeding (5.00%), hematemesis with rectal bleeding (2.50%), and chronic anemia (1.87%).

Patient history showed that 52.81% had cirrhosis, 24.06% used NSAIDs, 7.81% were smokers, and 15.31% had no significant medical conditions. Endoscopic findings showed 48.44% of cases were due to variceal bleeding, while 51.56% were non - variceal. All cases of variceal bleeding (100%) required endoscopic hemostasis, while only 10.90% of non - variceal bleeding cases required the same.

**Table 1:** Baseline characteristics of patients included

| Characteristics | | Variable | |
|---|---|---|---|
| Patients included | | | |
| Sex | Male | 225 (70.31%) | Sex ratio |
| | Female | 95 (29.69%) | 2.3: 1 |
| Age | < 40 years | 32 (10.00%) | |
| | 40 - 65 years | 218 (68.12% | |
| | > 65 years | 70 (21.87%) | |
| Mean age | | 57.03 ± 12.24 | |
| Geographic | Phnom Penh | 60 (18.75%) | |
| | Provinces | 260 (81.25%) | |
| Bleeding Manifestation | | | |
| Hematemesis and melena | | 157 | 49.06% |
| Melena | | 72 | 22.50% |
| Hematemesis | | 61 | 19.06% |
| Rectal bleeding | | 16 | 5.00% |
| Hematemesis and rectal bleeding | | 8 | 2.50% |
| Chronic anemia | | 6 | 1.87% |
| Past History | | | |
| Cirrhosis | | 169 | 52.81% |
| NSAIDs used | | 77 | 24.06% |
| Smoking | | 25 | 7.81% |
| Unremarkable | | 49 | 15.31% |
| Endoscopy finding (Variceal & Non - variceal bleeding) | | | |
| Variceal bleeding | | 155 | 48.44% |
| Non - variceal bleeding | | 165 | 51.56% |
| Indication of Endoscopy hemostasis | | | |
| Variceal bleeding | | 155 | 155/155 (100%) |
| Non - variceal bleeding | | 165 | 18/165 (10.90%) |

**Different characteristics of VUGIB and NVUGIB**

**Different between VUGIB and NVUGIB in both sexes**

According to the study, the differences in sex and age between the two groups. Among the 155 patients with VUGIB, 68.38% were male, and 31.61% were female. In comparison, of the 165 NVUGIB patients, 70.90% were male, and 28.48% were female. The difference in sex distribution between the two groups was not statistically significant (p = 0.6). However, the mean age was significantly higher in the NVUGIB group (56.87 ± 13.6 years) compared to the VUGIB group (53.41 ± 11.14 years, p = 0.01).

**Table 2:** Different between variceal and nonvariceal bleeding in both sexes

| Variables | VUGIB (N=155) | NVUGIB (N=165) | p - value |
|---|---|---|---|
| Male | 106 (68.38%) | 117 (70.90%) | 0.6 |
| Female | 49 (31.61%) | 47 (28.48%) | |
| Mean age | 53.41±11.14 | 56.87±13.6 | 0.01 |

**Different manifestations of bleeding between VUGIB and NVUGIB**

The *Table 3* shows the variations in clinical presentations. Hematemesis and melena were more frequent in the VUGIB group (52.90%) than in the NVUGIB group (45.45%), though the difference was not significant (p = 0.18). Melena alone was significantly more common in the NVUGIB group (27.27%) than in the VUGIB group (17.41%, p = 0.03). Rectal bleeding and hematemesis with rectal bleeding were significantly higher in the UGIB - VB group (p = 0.007 and p = 0.02, respectively). Chronic anemia was observed only in the UGIB - NVB group (3.63%, p = 0.01).

**Table 3:** Different manifestations of bleeding between variceal and non - variceal bleeding

| Clinical Parameters | VUGIB (N=155) | NVUGIB (N=165) | p - value |
|---|---|---|---|
| Hematemesis and Melena | 82 (52.90%) | 75 (45.45%) | 0.18 |
| Melena | 27 (17.41%) | 45 (27.27%) | 0.03 |
| Hematemesis | 26 (16.77%) | 35 (21.21%) | 0.31 |
| Rectal bleeding | 13 (9.03%) | 3 (1.21%) | 0.007 |
| Hematemesis and Rectal bleeding | 7 (4.51%) | 1 (0.60%) | 0.02 |
| Chronic anemia | 0 | 6 (3.63%) | 0.01 |

**Different risk factors for VUGIB and NVUGIB**

As shown in Table 4, 95.48% of VUGIB patients had a history of cirrhosis compared to only 12.72% of NVUGIB patients ($p < 0.0001$). Conversely, NSAID use was reported exclusively in the NVUGIB group (46.66%, $p < 0.0001$). Smoking was also only noted in the NVUGIB group (15.15%, $p < 0.0001$). Additionally, unremarkable histories were more prevalent in the NVUGIB group (25.45%) compared to the VUGIB group (4.51%, $p < 0.0001$).

**Table 4:** Different risk factors for variceal and nonvariceal bleeding

| History | VUGIB (N=155) | NVUGIB (N=165) | p - value |
|---|---|---|---|
| Cirrhosis | 148 (95.48%) | 21 (12.72%) | < 0.0001 |
| NSAIDs | 0 | 77 (46.66%) | < 0.0001 |
| Smoking | 0 | 25 (15.15%) | < 0.0001 |
| Unremarkable | 7 (4.51%) | 42 (25.45%) | < 0.0001 |

**Differences in endoscopic therapy and outcomes**

As presented in *Table 5*, among the 144 patients with VUGIB, 95.13% were successfully discharged, 2.81% experienced re - bleeding, and 2.11% were categorized as hopeless cases. In the NVUGIB group (n = 18), 83.33% were discharged, 11.11% had re - bleeding, and 5.55% were hopeless. These differences in outcomes were not statistically significant ($p = 0.13$).

**Table 5:** Differences in endoscopic therapy and outcomes

| Outcomes | VUGIB (N=144) | NVUGIB (N=18) | p - value |
|---|---|---|---|
| Discharged | 137 (95.13%) | 15 (83.33%) | 0.13 |
| Re - bleeding | 4 (2.81%) | 2 (11.11%) | |
| Hopeless | 3 (2.11%) | 1 (5.55%) | |

## 4. Discussion

**Comparison of Patients' Characteristics**

The study highlights several important demographic and clinical characteristics of the population. Of the 320 patients included, a significant majority were male (70.31%), resulting in a male - to - female ratio of 2.3: 1. This predominance of males aligns with previous studies that associate gastrointestinal bleeding with higher exposure to risk factors such as smoking and alcohol consumption, which are more prevalent among men, as supported by Kurien M et al. (2019) and Wuerth BA et al. (2018) [2, 9].

The mean age of the patients was 57.03 ± 12.24 years, with the majority (68.12%) aged between 40 and 65 years. This finding aligns with studies indicating that gastrointestinal bleeding predominantly affects middle - aged adults, largely due to comorbidities and higher exposure to medications such as NSAIDs, which increase the risk of bleeding. This is supported by Abougergi MS et al. (2015) and Wuerth BA et al. (2018) [3, 9].

Geographically, most patients (81.25%) were from provincial areas, reflecting potential disparities in healthcare access or a higher prevalence of conditions such as cirrhosis in rural populations. Similar findings have been noted in previous studies, which emphasize the need for improved healthcare infrastructure in underserved regions, as supported by Leontiadis GI et al. (2013) and Nahon S et al. (2012) [4, 10].

Bleeding manifestations were predominantly hematemesis and melena (49.06%), followed by isolated melena (22.5%) and hematemesis (19.06%). This is consistent with the literature, where upper gastrointestinal bleeding (UGIB) is cited as the most common presentation. Rectal bleeding and chronic anemia were relatively rare, indicating that lower gastrointestinal sources and long - term sequelae were less frequently observed, as supported by Rațiu I et al. (2022) and Sey MSL et al. (2019) [1, 5].

Endoscopic findings revealed an almost equal distribution between variceal (48.44%) and non - variceal bleeding (51.56%). Variceal bleeding was universally treated with endoscopic hemostasis, consistent with guidelines emphasizing the importance of early intervention for variceal cases due to their higher mortality and rebleeding risks, as supported by Tajiri T et al. (2010) and Chiu PW et al. (2009) [11, 12]. In contrast, only 10.9% of non - variceal cases required endoscopic intervention, highlighting the varied etiologies and risks associated with non - variceal bleeding, as supported by Sarin SK et al. (1992), Tandon P et al. (2018) [13, 14].

The high prevalence of cirrhosis (52.81%) underscores its significant role in gastrointestinal bleeding, particularly in variceal cases, as reported by Monteiro S et al. (2016) and Tandon P et al. (2018) [6, 14]. NSAID use was reported in 24.06% of patients, aligning with prior findings associating these medications with an increased risk of non - variceal bleeding, particularly peptic ulcers, as supported by Abougergi MS et al. (2015) and Hearnshaw SA et al. (2011) [3, 15].

This study highlights the importance of targeted prevention and management strategies for gastrointestinal bleeding. Greater focus should be placed on the early identification of high - risk individuals, particularly those with cirrhosis, NSAID use, or other predisposing factors. Furthermore, enhancing endoscopic capabilities and healthcare resources in rural areas is crucial to addressing the burden of gastrointestinal bleeding more effectively, as supported by Nahon S et al. (2012) and Klebl F et al. (2005) [10, 16].

**Differences Between Variceal and Non - Variceal Bleeding in Both Sexes**

The study found no significant difference in sex distribution between VUGIB and NVUGIB groups. Males predominated in both groups, with 68.38% in VUGIB and 70.90% in NVUGIB ($p = 0.6$). This aligns with studies by Barkun et al. (2019), Kim et al. (2019), Laine et al. (2020) [7, 17, 18]. which also reported a male predominance. However, the mean age differed significantly, with UGIB - NVB patients being older (56.87 ± 13.6 years) compared to VUGIB patients (53.41 ± 11.14 years, $p = 0.01$). This reflects patterns observed in Western cohorts (Thompson et al., 2018) [19]. However, the higher mean age in the NVB group (56.87 vs.53.41 years, $p = 0.01$) corroborates findings by Tielleman et al. (2018) [20], emphasizing the association of NVUGIB with older patients, likely due to comorbidities like NSAID use.

**Differences in Clinical Presentations of Bleeding**

The study highlights the differences in bleeding manifestations between variceal bleeding (VUGIB) and non - variceal bleeding (NVUGIB). Hematemesis and melena were

the most common presentations in both groups, occurring in 52.90% of VUGIB and 45.45% of NVUGIB cases (p = 0.18). This indicates that these presentations are generally nonspecific and can occur in a wide range of upper gastrointestinal bleeding etiologies, as supported by Kurien M et al. (2019) and Monteiro S et al. (2016) [2, 6].

Melena was significantly more frequent in NVUGIB (27.27%) compared to VUGIB (17.41%) (p = 0.03). This finding aligns with previous studies that associate melena with slower bleeding, which is more characteristic of non - variceal sources like peptic ulcers or arteriovenous malformations, as supported by Leontiadis GI et al. (2013) [4]. Hematemesis occurred slightly more frequently in NVUGIB (21.21%) compared to VUGIB (16.77%), although this difference was not statistically significant (p = 0.31).

Rectal bleeding showed a significant difference, being more prevalent in VUGIB (9.03%) than NVUGIB (1.21%) (p = 0.007). This is likely because brisk variceal bleeding may sometimes manifest as fresh blood passing rapidly through the gastrointestinal tract. Such presentations can complicate diagnosis and highlight the need for prompt identification of variceal bleeding sources, as supported by Sarin SK et al. (1992) [12].

Cases presenting with hematemesis combined with rectal bleeding were also significantly higher in VUGIB (4.51%) compared to NVUGIB (0.60%) (p = 0.02). This further underscores the severity of variceal bleeding, which often involves massive blood loss and rapid clinical deterioration, as supported by Rout G et al. (2019) [21].

Chronic anemia, on the other hand, was observed exclusively in NVUGIB (3.63%) and not in VUGIB (p = 0.01). This suggests that non - variceal bleeding, particularly from chronic sources like peptic ulcers, often leads to slow, occult blood loss over time, resulting in anemia without acute symptoms, Leontiadis GI et al. (2013), Rout G et al. (2019) [4, 21].

The differences between VUGIB and NVUGIB underscore the importance of tailored management strategies based on the source and presentation of bleeding. Early endoscopic intervention and risk stratification are crucial for improving patient outcomes in both groups.

**Differences in Risk Factors**

The etiology of VUGIB and NVUGIB differed significantly. Cirrhosis was the predominant risk factor for VUGIB, present in 95.48% of cases compared to only 12.72% in NVUGIB (p < 0.0001). in line with Garcia - Tsao et al. (2017) [8], who emphasized the impact of portal hypertension. Conversely, NSAID use (46.66%) and smoking (15.15%) were exclusive to NVUGIB patients (p < 0.0001 for both). These findings align with studies by Bai et al. (2019), Lanas et al. (2020), Sung et al. (2010) [22 - 24], emphasizing the distinct etiological pathways underlying variceal and non - variceal bleeding.

**Differences in Endoscopic Therapy and Outcomes**

Endoscopic hemostasis was required for all VUGIB cases (100%) but only for 10.90% of NVUGIB cases, reflecting the more severe nature of variceal bleeding. Similar trends were reported by Villanueva et al. (2013) [25]. Outcomes showed no significant differences between the groups in terms of discharge rates (95.13% for VUGIB vs.83.33% for NVUGIB, p = 0.13), re - bleeding (2.81% vs.11.11%), or hopelessness (2.11% vs.5.55%). This consistency in outcomes highlights the effectiveness of current endoscopic and medical therapies, as also noted by Garcia - Tsao et al. (2017) [8] and Thomopoulos et al. (2015) [26].

## 5. Conclusion

Our study underscores the considerable burden of upper gastrointestinal bleeding in patients treated at Cambodia - China Friendship Preah Kossamak Hospital. The findings reveal a nearly equal distribution between variceal and non - variceal bleeding, with cirrhosis and NSAID use identified as critical etiological factors. Variceal bleeding was universally associated with severe presentations requiring endoscopic intervention, while non - variceal cases demonstrated a higher prevalence of chronic anemia and re - bleeding episodes.

Male predominance and advanced age, particularly among non - variceal cases, highlight the need for gender - and age - specific preventive measures. Furthermore, the disproportionate number of patients from rural areas emphasizes the importance of improving healthcare accessibility in underserved regions.

Enhanced endoscopic screening and targeted management strategies for high - risk populations, including patients with cirrhosis, NSAID use, and advanced age, are essential to mitigate the burden and improve outcomes of UGI bleeding.

## 6. Recommendation

We recommend that healthcare professionals managing patients with upper gastrointestinal bleeding, including hepatologists, gastroenterologists, and primary care providers, prioritize targeted prevention strategies for cirrhosis and NSAID - related risks. Strengthening endoscopic capabilities and focusing on high - risk populations, particularly in rural areas, is crucial for improving patient outcomes and reducing the burden of UGIB.

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