Original Article

Pharm Sci Asia 2018; 45 (3), 184-194
DOI : 10.29090/psa.2018.03.184

The treatment of non-variceal gastrointestinal bleeding: An investigation in a Vietnamese hospital

X.T. Ngo[1], T.T.Q. Ngo[2], D.T. Vo[3], T.H.Q. Bui[1]*
[1] Department of Clinical Pharmacy, Faculty of Pharmacy, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam
[2] Department of Gastroenterology, Thong Nhat Hospital, Ho Chi Minh City, Vietnam
[3] Department of Internal Medicine, Faculty of Medicine, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam

ARTICLE INFO
Article history:
Received 30 September 2017
Received in revised form
5 February 2018
Accepted 20 February 2018

KEYWORDS:
Non-variceal upper gastrointestinal (NVUGIB); Proton pump inhibitors (PPIs); Endoscopy therapy; Blood transfusion; Tranexamic acide.

ABSTRACT

Non-variceal upper gastrointestinal bleeding (NVUGIB) is a critical condition, which frequently leads to hospitalization or mortality. European Society of Gastrointestinal Endoscopy (ESGE) and Asia-Pacific Working Group consensus on the Management of Patients with Non-variceal Upper Gastrointestinal Bleeding (ICON-UGIB) has provided comprehensive guidelines for diagnosis and management of NVUGIB. The aims of this study were to determine to rate of appropriate indications for treatment of patients with NVUGIB and whether the use of recommended resuscitative measures and drugs contribute to the improvement of patients. A descriptive cross-sectional study was conducted using medical records of in-patients diagnosed with NVUGIB from 1st January 2016 and 30th Jun 2016 at Thong Nhat hospital, Vietnam. Patients' clinical characteristics, endoscopic profiles, and treatments were recorded. The Glasgow Blatchford score was evaluated without endoscopic findings, whereas Forrest classification is based on endoscopic findings of an ulcer. The rational treatment of NVUGIB was evaluated based on European Society of Gastrointestinal Endoscopy (2015) and Asia-Pacific Working Group consensus on NVUGUB (2011). There were 98 patients of median age 59.9 years, and 33.7% of them had peptic ulcer disease. Most patients were male (65.3%). Appropriate indications of blood transfusion (OR 19.74, 95%CI 2.00 – 194.45, p=0.011), endoscopic hemostasis (OR 19.61, 95%CI 1.54 – 250.00, p=0.019), post-endoscopy PPI (OR 40.27, 95%CI 4.56 – 355.85, p=0.001), and acid tranexamic (OR 4.06, 95%CI 1.07 – 15.43, p=0.039) were associated with improvement of patient outcomes. Amelioration of NVUGIB patients depends on the rational indications of blood transfusion, endoscopic haemostasis, and PPIs. Optimization and personalization are essential to improve effectiveness and safety of the treatment.

1. INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a potentially life-threatening condition which can be defined as bleeding proximal to the ligament of Treitz. The annual incidence of UGIB ranges from 40 to 150 among

***Corresponding author:** huongquynhtn@gmail.com

100,000 people[1,2], with a mortality from 10% to 14% [3,4]. The most common causes of UGIB are non-variceal (NVUGIB), bleeding in the absence of esophageal, gastric or duodenal varices [5,6]. NVUGIB accounts for 60% to 95% of UGIB, depending on the specific area involved[1]. Although there are developments in therapeutic management, including endoscopy and medicine, mortality rate has been high and remained unchanged during the last decades[3,4]. Older people are more susceptible and tend to suffer from more serious bleeding than younger people. This is caused by the fact that patients with UGIB nowadays are older and more likely to have relevant co-morbidity than in the past.

EGSE Guideline[7] provided a comprehensive recommendation on the clinical and endoscopic management of NVUGIH. It is composed of several steps to diagnosis and management of NVUGIB, including initial patient evaluation and hemodynamic resuscitation, risk stratification, pre-endoscopy management, endoscopic therapy and post endoscopy/ endoscopic hemostasis management.

The International Consensus Recommendations on the Management of Patients with Non-variceal Upper Gastrointestinal Bleeding (ICON-UGIB)[11] highlighted the important strategies that may be more suitable for use in the Asia-Pacific Region. ICON-UGIB and ESGE Guideline bear a close resemblance in terms of risk stratification, PPI therapy regimens, and so on. Applying the treatments appropriately can minimize and reverse the direct consequences of bleeding, and prevent end-organ damage induced by bleeding, such as hypoxia or prerenal azotemia.

In Vietnam, there is a lack of available studies that investigated the overall effectiveness of the current use of drugs, resuscitative measures, and the general therapy of UGIB. Therefore, the aims of this study were to determine rate of appropriate indications for treatment of patients with NVUGIB and whether the use of recommended resuscitative measures and drugs contribute to the improvement of patients.

2. MATERIALS AND METHODS

2.1. Study settings

This was a descriptive cross-sectional study using medical records of patients undergoing NVUGIB at Thong Nhat hospital, Vietnam. The protocol of this study was approved by the Institutional Review Board of the Thong Nhat hospital.

2.2. Inclusion criteria

Patients aged 18 years or older who underwent NVUGIB from 1st January 2016 and 30th Jun 2016.

2.3. Exclusion criteria

- Patients with upper gastrointestinal bleeding because of esophageal variceal bleeding.
- Patients with upper gastrointestinal bleeding because of portal hypertension.
- Patients with cirrhosis of the liver, severe liver impairment.

2.4. Sample size

All patients who met the study criteria were included.

2.5. Study process

After obtaining institutional ethical approval, we developed our data collection from medical records of patients who were diagnosed with non-variceal upper gastrointestinal bleeding between 1st January 2016 and 30th Jun 2016 from point of admission to discharge or death. Data collection included age, sex, height, weight, comorbidities, smoking history or alcohol consumption within 48 hours before appearance of bleeding signs. Information such as patient's complaints including haematemesis, melena, coffee-ground vomitus, haematochezia, alteration of consciousness, abdominal pain, and vital signs such as heart rate (pulse), respiratory rate, blood pressure, body temperature were recorded to assess hemodynamic stability and necessary resuscitation commenced. The required laboratory parameters including values for hematology (the red blood cells count -

RBC, hemoglobin - HB and hematocrit - HCT, the red white cells count - WBC, clinical chemistry (blood urea nitrogen - BUN, creatinine blood level, ALT, AST), and electrocardiography were recorded. Endoscopy findings were recorded including the number, site of bleeding episodes, and Forrest stratification.

Medical treatments included fluid infusion, blood transfusion, endoscopic hemostasis, pre-endoscopy PPI therapy, post-endoscopy PPI therapy; other medications (acid tranexamic, vitamin K, gastropulgite/phosphalugel, and so on) were evaluated for appropriateness according to ESGE Guideline[7] and ICON-UGIB[11]. Appropriate indication was defined if that indication is recommended by at least one of the guidelines mentioned above, others were inappropriate. In this study, we also defined the "improvement of patient outcomes" as when during the treatment period, patients did not present any typical and objective signs of NVUGIB (haematemesis and melena) along with the amelioration of hemoglobin level.

2.6. Ethics approval

The protocol of this study was approved by the Institutional Review Board of the Thong Nhat Hospital (Project Number: 105 IRB/ QDBVTN 07022016)

2.7. Statistical analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) Program, version 20.0. Patient's data were presented as mean ± S.D., median (interquartile range 25-75%) or percentage. Correlation between the improvement of patient outcomes and other factors such as the volume of fluid infusion, the appropriate blood transfusion treatment, the appropriate endoscopic hemostasis indication, the appropriateness of post-endoscopy PPI therapy, the appropriate tranexamic acid indication, and vitamin K indication were assessed by using binary logistic regressions analysis. The level of statistical significance was specified if $p < 0.05$.

3. RESULTS

3.1. Baseline characteristics of patients

During the whole study period, our study comprised of 98 patients with acute UGI bleeding. The median age of patients with UGIB was 59.9 years (range 18 – 89) and 42.9% were over 80 years. Most of the patients were males (65.3%). Out of 98 patients, 93 patients (91.8%) had at least one comorbidity. 28.6% present with one chronic condition, compared with 25.5% of patients with 2 comorbidities and 18.3% of patients with 3 comorbidities. The top 3 comorbidities in this study were gastritis (43.9%), peptic ulcer (33.7%) and diabetes (33.7%). There was a history of NSAIDs consumption within 48 hours before present signs of bleeding in 14.3%, and alcohol consumption in 8.2%. Forty-eight patients (48.9%) presented with both hematemesis and melena. At the time of presentation, 7 patients (7.1%) had shock i.e. systolic blood pressure < 90 mm Hg, 28 patients (28.6%) had severe anemia (Hemoglobin < 7g/dL) and 45 patients (45.9%) had blood urea level (>7.5 mmol/L). Thirteen patients (13.3%) had abnormal ECG results.

The most common site of peptic ulcer was duodenal ulcer, which was detected in 40 patients (40.8%). The baseline characteristics of patients including demographic data, comorbidities, NSAIDs and alcohol consumption, clinical signs, laboratory test and endoscopy findings of UGIB, were presented in Table 1.

Table 1. Demographic, clinical characteristics and endoscopy findings of patients with UGIB

Baseline characteristics		**N**	**%**
Age	Median	59.9	
	< 60	16	16.3
	60 - 80	40	40.8
	> 80	42	42.9
Gender	Male	64	65.3
	Female	34	34.7
Comorbidities	Peptic ulcer disease	33	33.7
	Gastritis	43	43.9
	Diabetes	33	33.7
	Hypertension	30	30.6
	History of UGIB	11	11.2
	History of ischemia	12	12.2
	History of stroke	5	5.1
	Muscular disorders	10	10.2
	Liver diseases	6	6.1
	Others	24	24.5
NSAIDs and alcohol consumption within 48 hours before present any signs of bleeding	NSAIDs	14	14.2
	Alcohol	8	8.2
	NSAIDs + Alcohol	3	3.1
Presenting complaints	Haematemesis	19	19.4
	Melena	37	37.8
	Haematemesis and melena	41	41.8
Hb level	< 7 g/dL	28	28.6
	≥ 7 g/dL	70	71.4
Blood urea nitrogen	Normal (2.5 – 7.5 mmol/L)	53	54.1
	Evaluated (≥ 7.5 mmol/L)	45	45.9
ECG	Normal	46	46.9
	Abnormal	13	13.3
Endoscopic findings			
Sites of ulcers	Fundus	6	6.1
	Body	6	6.1
	Pyloris	23	23.5
	Cardia	40	40.8
	Duodenum	2	2.0
	Undetected	3	3.1

Table 1 Demographic, clinical characteristics and endoscopy findings of patients with UGIB

Endoscopic findings		N	%
Number of ulcers	1	63	64.3
	2	10	10.2
	3	3	3.1
	4	1	1.0
	Undetected	3	3.1
Forrest classification	Ia	4	4.1
	Ib	10	10.2
	IIa	13	13.3
	IIb	12	12.2
	IIc	12	12.2
	III	29	29.6

3.1. Correlation between the improvement of patient outcomes and treatments of NVUGIB

Medical treatments such as fluid infusion, blood transfusion, endoscopic hemostasis, pre-endoscopy PPI therapy, post-endoscopy PPI therapy, other medications (acid tranexamic, vitamin K, gastropulgite/phosphalugel, and so on) were analyzed in this study. We obtained that all of the patients were recommended fluid infusion in both emergency department and gastroenterology unit. The median volume and number of days of administered fluid were 3,386.6 ml and 4.1 days, respectively. Blood transfusion was done in 34 patients (34.8%) with 14 patients requiring higher than 4 units, and the mean number of transfusion being 3.9 units. Only 14 among 34 patients (41.2%) were indicated this treatment appropriately. Out of 98 patients, there were 13 patients (13.3%), recommended endoscopic hemostasis with adrenaline injection (1:10,000), which were appropriate endoscopic hemostasis indication. After adrenaline injection, only one patient (7.7%) had recurrent bleeding within 24 hours. All of 98 patients were administered esomeprazole before implementing endoscopy. Two PPIs regimens namely high dose intravenous pump inhibitors (esomeprazole 40 mg bid) and intravenous bolus followed by continuous infusion (80 mg then 8 mg/hour) for 72 hours post endoscopy were administered in 37 patients (37.8%) and 61 patients (62.2%), respectively. As regard post-endoscopy PPI therapy, the two regimens as mentioned above were recommended in 26 patients (26.5%) and 72 patients (73.5%), in that order. The appropriate post-endoscopy PPI therapy was identified in 62 patients (63.2%). Tranexamic acid, vitamin K and gastropulgite/phosphalugel were administered in 46 patients (46.9%), 17 patients (17.4%), and 98 patients (100%), respectively. According to ESGE Guideine, the indication of tranexamic acid was inappropriate.

Based on the term "the improvement of patient outcomes", we obtained that 39 patients (39.8%) had an amelioration in NVUIGB treatment. Appropriate indications of blood transfusion (OR 19.74, 95%CI 2.00– 194.45, p=0.011), endoscopic hemostasis (OR 19.61, 95%CI 1.54 – 250.00, p=0.019), post-endoscopy PPI (OR 40.27, 95%CI 4.56 – 355.85, p=0.001), and acid tranexamic (OR 4.06, 95%CI 1.07 – 15.43, p=0.039) were associated with improvement of patient outcomes. The medical treatments and the appropriateness of these treatments were shown in Table 2. The correlation between the improvement of patient outcomes and treatments of NVUGIB was illustrated in Table 3.

Table 2. The medical treatment and the appropriateness of NVUGIB treatments

Treatments	Characteristics	N	%	Number of patients were appropriately indicated	Percentage of patients were appropriately indicated
Fluid infusion	Volume	3,386.6 ml			
	Number of days	4.1 days			
Blood transfusion	2 units	3	8.8	1	2.9
	3 units	15	44.5	9	26.5
	4 units	2	5.9	0	0
	>4 units	14	41.2	6	17.6
Endoscopic hemostasis	1 vial adrenaline injection	11	11.2	11	11.2
	2 vials adrenaline injection	2	2.0	2	2.0
	Not indicated	85	86.8	72	73.5
Pre-endoscopy PPI therapy	Intravenous esomeprazole 40 mg bid	37	37.8		
	Intravenous esomeprazole bolus followed by continuous infusion (80 mg then 8 mg/hour) for 72 hours post endoscopy	61	62.2		
Post-endoscopy PPI therapy	Intravenous esomeprazole 40 mg bid	26	26.5	19	19.4
	Intravenous esomeprazole bolus followed by continuous infusion (80 mg then 8 mg/hour) for 72 hours post endoscopy	72	73.5	43	43.8
Other medications	Tranexamic acid	46	46.9	0	0
	Vitamin K	17	17.4		
	Gastropulgite/Phosphlugel	98	100		

Table 3. The correlation between the improvement of patient outcomes and treatments of NVUGIB

Treatments	OR	95% CI		p-value
		Upper Limit	Lower Limit	
Appropriate blood transfusion treatment	19.74	2.00	194.45	**0.011**
The volume of fluid infusion	1.00	1.00	1.00	0.783
Appropriate endoscopic hemostasis indication (Injection adrenalin 1/10 000)	19.61	1.54	250.00	**0.019**
Appropriate post-endoscopy PPI therapy	40.27	4.56	355.85	**0.001**
The appropriate tranexamic acid indication	4.06	1.07	15.43	**0.039**
The indication of vitamin K	2.36	0.51	10.98	0.273

Correlation between the improvement of patient outcomes and the volume of fluid infusion, the appropriate blood transfusion treatment, the appropriate endoscopic hemostasis indication, the appropriateness of post-endoscopy PPI therapy, the appropriate tranexamic acid indication, and vitamin K indication were assessed by using multiple logistic regression.

4. DISCUSSION

Most of the patients in our study were aged above 60 (83.7%). In the present study, mean age was 59.9 ± 19.9 which was higher than those involved in Rukewa A, study[12] (44.9 years old) and was similar to studies reported by from Nguyen TTT, et al[13] (63.3 years old). The explanation was that most of the patients in Thong Nhat hospital were veterans. It also explains why male predominance was reported in our study with 65.3%. Similarly, the proportion of male was also greater than female counterpart in other studies, 69.2% male in Rukewa A, et al study[12], 78.4% males reported by Kashyap et al[14]. This was mainly because male population is more likely to expose various risk factors such as smoking and alcohol consumption[15].

In our study, most of patients had one co-morbidity or more (91.8%), which was higher than the result in study conducted by Kaya E, et al. (86.7%) [16]. According to the results of Crooks CJ, et al study[17], non-gastrointestinal co-morbidity such as uncomplicated diabetes, hypertension, myocardial infarction, rheumatological diseases, and renal diseases, was an independent risk factor for NVUGIB, and contributes to a greater proportion of patients with bleeding in the population than other recognized risk factors. In addition, peptic ulcer and gastritis were the most common co-morbidities in our study with 43.9% and 33.7%, respectively. The majority of studies implemented all over around the world showed a same result as peptic ulcer disease accounts for about half of all UGIB[5,6]. Apart from it, hypertension and diabetes were also accounted for a greater proportion in study population with 30.6% and 30.7%, respectively. Faigel DO, et al study [18] showed that 13% diabetic patients had UGIB. The longer time patients had diabetes, the greater prevalence and severity of UGIB they had. However, the association between diabetes and UGIB is still unclear. Muscular disorders were recorded with 10.2% in our study. The use of certain types of pain reliever, especially NSAIDs, poses a threat risk to develop UGIB.

Atoba MA, et al[19] suggested that the etiology of acute UGIB at their centre was acute alcohol imbibition followed by NSAIDs while in Ilorin, Nigeria, abuse of NSAIDs was the major implicated aetiological agents. In addition, Rukewa A, et al study[12] illustrated that use of NSAIDs (16.8%) was the most common risk factor for NVUGIB, and followed by alcohol. In this study, we obtained a relatively high proportion of patients used NSAIDs and alcohol within 48 hours before present any signs of bleeding. This finding would suggest the need for more advocacy against the over-consumption of NSAIDs. However, it is certainty that whether older patients get the higher time and dose of NSAIDs patients received, because of facts such as some arthrodegenerative changes, cardiovascular, haematologic and oncologic use associated with the normal aging process. This is not to mention the fact that the aging gastric mucosa is more likely to susceptible with NSAIDs and alcohol, the so-called "aging gastropathy".

The greater number of patients in our study presented with melena with 78 patients (79.6%) of whom 41 patients (41.8%) presented with both hematemesis and melena. The proportion of patients who presented with two typical clinical signs in our study was higher than this result in Olokoba AB, et al study[20]. Older patients and multiple co-morbidities can be the reason why the severity of UGIB in our study tend to more severe compared with Olokoba AB, et al[20] study. As a result, these symptoms clearly presented.

In the present study 28 patients (28.6%) had Hb < 7g/dL which was lower than 34.2% reported by Dewan KR, et al study[21]. However, with 28.6% patients had low Hb level, our population need immediately identify blood group and prepare rational blood units to prevent complications of acute bleeding. Most of patients were timely resuscitated with intravenous fluid replacement, blood transfusion and intravenous proton pump inhibitors.

High blood urea (> 25 mmol/L) was found in 6 patients (6.1%). There was one case blood urea reach to 47 mmol/L. This percentage in our study was lower than the result in Dewan KR, et al study [21] (38.3%). The finding of AI-Namamani K, et al study [22] suggested that in patients with NVUGIB, the blood urea level at initial presentation was a weak predictor of the severity of UGIB as defined by ICU admission, but was not helpful in identifying patients with a high-risk lesion. The authors explained that UGIB did not the only source of high blood urea, other factors such as volume contraction or ingestion of protein would affect the level of urea in blood. They also suggested BUN to creatinine ratio correlate significantly with UGIB with a cut point being 10:1. Out of 98 patients, there were 59 patients (60.2%) recommended ECG. This is relatively high because serial cardiac enzymes and ECGs are not routinely obtained in patients with GI hemorrhage. However, Bhatti N, et al study [23] indicated that ECG should be administered in patients with a higher acuity of illness as MI was a relatively common complication of GI hemorrhage.

UGI endoscopy was done within 24 hours in 80 patients (81.6%). In the present study, we found that duodenal ulcers were more common than gastric ulcers with 40 patients (50%). This is particularly true in most of the studies. Our patients were further classified according to Forrest classification. Most of patients (36.2%) with peptic ulcer disease had ulcer with clean base (Forrest III). The working process of Thong Nhat hospital was that at the very beginning patients were hospitalized at emergency department, in which they were administered resuscitation such as fluid infusion, hemodynamic stability, etc. After patients were stable, they were transferred to gastroenterology unit. Endoscopy was carried out in gastroenterology unit. Although endoscopy was done within 24 hours after admission, but the severity of UGIB would be improved. This is the reason why most of patients in our study had Forrest classification IIa, IIb, IIc, and III. This does not mean patients in our study were not more severely ill than others.

100% patients of our study were indicated fluid transfusion, which was higher than the result in Dewan KR, et al study [21] (75%). Over-infusion of IV fluids may cause fluid

retention, which can lead to pulmonary edema, which causes shortness of breath, crackling, and so on. In addition, most of current guidelines do not have clear recommendations about fluid infusion in terms of the volume and the number of days. It is important to take various factors into consideration to has a reasonable fluid infusion strategy. We found that there are 34 patients (34.8%) administered blood transfusion, which was higher than 29.6% in Quach TĐ et al. study [24] and 23.3% in Stanley AJ et al. study25. It can be explained that the median age of Stanley AJ was low (56.7 years), low co-morbidities, and inclusion criteria included patients with variceal upper gastrointestinal bleeding whose blood transfusion was limited. According to appropriate blood transfusion treatment was defined in above-mentioned, the results showed that 14 of 34 patients (41.2%) were rational administered this treatment. It is important to highlight that the need for blood transfusions is individualized. The rate of blood transfusion is determined by the severity of the hypovolemia, by the tempo of the bleeding, and the presence of comorbidities such as stroke, ischemia, renal diseases, and so on. As a result, it was difficult to assess the appropriateness of blood transfusion treatment. In our study, most of patients were older people, who have less cardiopulmonary reserve and may not tolerate mild anemia. Patients were aggressively transfused. It can lead to over-transfusion or too rapid transfusion, which can induce congestive heart failure and pulmonary edema in patients who have prior congestive heart failure or other cardiac diseases. The result suggested that patients in our study should be transfused cautiously and slowly. The percentage of appropriate endoscopic hemostasis of 86.7% recorded in our study. There were 13 patients with Forrest IIb whose did not recommend this treatment. Lin HJ, et al study[26] showed that 25% patients with Forrest IIb occurred re-bleeding within 30 days if those patients were not administered endoscopic hemostasis. According to ESGE Guideline, RCTs and a meta-analysis showed that endoscopic hemostasis demonstrated a significant advantage for endoscopic hemostasis in reducing ulcer re-bleeding (8.2% vs. 24.7 %, $p<0.001$) when compared with medical therapy alone. This suggested further studies need to be implemented to optimize the effectiveness and safety of endoscopic hemostasis therapy. All of patients in the present study were administered pre-endoscopic PPI therapy with two regimens. The ICON-UGIB guidelines stated that pre-endoscopy PPI therapy is recommended where endoscopy or endoscopic expertise is not available within 24 hours. In the present study, most of patients who had very low risk were discharged in emergency department, and was controlled as out-patients, while we carried out this study in gastroenterology unit. So, patients who did not need pre-endoscopy PPI therapy were not included in our study. Gastric acid inhibits platelet aggregation, impairs clot formation, and promotes fibrinolysis. The use of PPI therapy aims that raising the intragastric pH to 6 or higher, which can promote clot formation and reduce the risk of re-bleeding. As for the appropriateness of post-endoscopy PPI therapy, two regimens included intravenous esomeprazole bolus followed by continuous infusion (80 mg then 8 mg/hour) for 72 hours post endoscopy and intravenous esomeprazole 40 mg bid was recorded with 43.8% and 19.4%, respectively. The optimal PPI therapy for NVUGIB is still controversial. In addition, the ICON-UGIB was also recommended the use of high-dose oral PPIs for peptic ulcer bleeding in Asian populations. This can be blamed for the differences in underlying etiology and higher prevalence of *H. pylori* infection in the Asian population. Tranexamic acid was administered in 46 patients (46.9%), and the use of tranexamic acid was defined as "inappropriate" in our study. Tranexamic acid reduces clot breakdown by inhibiting the fibrinolytic action of plasmin. However, the beneficial effect of this drug did not persist. Therefore, most of current guidelines do not recommend tranexamic acid as a regular medication for treating NVUGIB. By using binary logistic regression analysis, we found that appropriate indications of blood transfusion, endoscopic hemostasis, post-endoscopy PPI, and tranexamic acid were associated with improvement of patient outcomes. The volume

of fluid infusion and the indication of vitamin K did not showed the same results ($p > 0.05$). These results appear to confirm the important role of blood transfusion, endoscopic therapy, post-endoscopy PPI therapy, and tranexamic acid indication in patients with NVUGIB. These treatments were highly inappropriately indicated in our study, especially in terms of blood transfusion, post-endoscopy PPI therapy, and tranexamic acid because the inappropriate rates were 53, 36.8 and 100%, respectively. This situation can be explained by the fact that a number of low-risk patients received intensive treatment that may be unnecessary. The risk for recurrence of bleeding was relative high and too hard to predict, so the physician applied these intensive treatments. This finding suggested that the use of ESGE Guideline and the ICON-UGIB should be applied carefully and re-examined to ensure the rationality of the treatment strategy.

5. CONCLUSIONS

These results appear to confirm the important role of blood transfusion, endoscopic therapy, post-endoscopy PPI therapy, and tranexamic acid indication in patients with NVUGIB. These treatments were highly inappropriately indicated in our study. This finding suggested that the use of ESGE Guideline and the ICON-UGIB should be applied carefully and re-examined to ensure the rationality of the treatment strategy.

6. ACKNOWLEDGEMENTS

The authors thank Thong Nhat Hospital for granting permission to access to medical records. This study was financially supported by the Faculty of Pharmacy, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam.

Conflict of interest

We have no conflict of interest to declare.

REFERENCES

1. Lassen A, Hallas J, De Muckadell OB. Complicated and uncomplicated peptic ulcers in a Danish county 1993-2002: a population-based cohort study. Am J Gastroenterol. 2006;101(5): 945-53.
2. Lewis JD, Bilker WB, Brensinger C, Farrar JT, Strom BL. Hospitalization and mortality rates from peptic ulcer disease and GI bleeding in the 1990s: relationship to sales of nonsteroidal anti-inflammatory drugs and acid suppression medications. Am J Gastroenterol. 2002; 97(10):2540-9.
3. Kim J. Management and prevention of upper GI bleeding. Gastroenterology and Nutrition Series PSAP-VII, 2012;7-26.
4. Palmer K. Acute upper gastrointestinal haemorrhage. Br Med Bull. 2007;83(1): 307-24.
5. Cappell MS, Friedel D. Initial management of acute upper gastrointestinal bleeding: from initial evaluation up to gastrointestinal endoscopy. Med Clin N Am, 2008;92(3): 491-509.
6. Boonpongmanee S, Fleischer DE, Pezzullo JC, Collier K, Mayoral W, Al-Kawas F, et al. The frequency of peptic ulcer as a cause of upper-GI bleeding is exaggerated. Gastrointest Endosc. 2004;59(7):788-94.
7. Gralnek IM, Dumonceau JM, Kuipers EJ, Lanas A, Sanders DS, Kurien M, et al. Diagnosis and management of nonvariceal upper gastrointestinal hemorrhage: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. Endosc. 2015; 47(10): 1-46.
8. Blatchford O, Murray WR, Blatchford M. A risk score to predict need for treatment for uppergastrointestinal haemorrhage.The Lancet. 2000; 356(9238):1318-21.
9. De Groot NL, Bosman JH, Siersema PD, Van Oijen MGH. Prediction scores in gastrointestinal bleeding: a systematic review and quantitative appraisal. Endoscopy. 2012; 44(08):731-9.
10. Rockall TA, Logan RF, Devlin HB, Northfield TC. Risk assessment after acute upper gastrointestinal haemorrhage. Gut. 1996; 38(3):316-21.
11. Sung JJ, Chan FK, Chen M, Ching JY, Ho KY, Kachintorn U, et al. Asia-Pacific

Working Group consensus on non-variceal upper gastrointestinal bleeding. Gut. 2010: 1-25.
12. Rukewe A, Otegbayo JA, Fatiregun A. Clinical characteristics and outcome of patients with upper gastrointestinal bleeding at the emergency department of a tertiary hospital in Nigeria. Ann Ib Postgrad Med. 2015;13(2):89-93.
13. Nguyen TTT, Phan QH, Nguyen NT, Nguyen TS, Lam THH. Risk factors of upper gastrointestinal induced by peptic ulcer disease in Department of General Internal Medicine, An Giang general hospital: An Giang General Hospital; 2010:20-5 *(in Vietnamese)*
14. Kashyap R, Mahajan S, Sharma B, Jaret P, Patial RK, Rana S, et al. A clinical profile of acute upper gastrointestinal bleeding at moderate altitude. Journal, Indian Academy of Clinical Medicine. 2005;6(3):225.
15. Elghuel A. The characteristics of adults with upper gastrointestinal bleeding admitted to Tripoli Medical Center: a retrospective case-series analysis. Libyan J Med. 2011; 6(1): 6283.
16. Kaya E, Karaca MA, Aldemir D, Ozmen MM. Predictors of poor outcome in gastrointestinal bleeding in emergency department. World J Gastroenterol. 2016; 22(16):4219.
17. Crooks CJ, West J, Card TR. Comorbidities Affect Risk of Nonvariceal Upper Gastrointestinal Bleeding. Gastroenterology. 2013; 144(7):1384-93.
18. Faigel DO, Metz DC. Prevalence, etiology, and prognostic significance of upper gastrointestinal hemorrhage in diabetic ketoacidosis. Dig Dis Sci. 1996; 41(1):1-8.
19. Atoba MA, Olubuyide IO, Aghadiuno PO. Gastrointestinal malignancies in a young tropical African population. Trop Doct. 1989; 19(3):135-7.
20. Olokoba AB, Olokoba LB, Jimoh AA, Salawu FK, Danburam A, Ehalaiye BF. Upper gastrointestinal tract endoscopy indications in northern Nigeria. J Coll Physicians Surg Pak 2009; 19(5):327-8.
21. Dewan KR, Patowary BS, Bhattarai S. A study of clinical and endoscopic profile of acute upper gastrointestinal bleeding. Kathmandu Univ Med J. 2015; 12(1): 21-5.
22. Al-Naamani K, Alzadjali N, Barkun AN, Fallone CA. Does blood urea nitrogen level predict severity and high-risk endoscopic lesions in patients with nonvariceal upper gastrointestinal bleeding?. Can J Gastroenterol Hepatol. 2008; 22(4):399-403.
23. Bhatti N, Amoateng-Adjepong Y, Qamar A, Manthous CA. Myocardial Infarction in Critically III Patients Presenting With Gastrointestinal Hemorrhage: Retrospective Analysis of Risks and Outcomes. Chest. 1998; 114(4):1137-42.
24. Quach DT, Dao NH, Dinh MC, Nguyen CH, Ho LX, Nguyen NDT, et al. The performance of a modified Glasgow Blatchford score in predicting clinical interventions in patients with acute nonvariceal upper gastrointestinal bleeding: a Vietnamese prospective multicenter cohort study. Gut Liver. 2016; 10(3):375.
25. Stanley AJ, Dalton HR, Blatchford O, Ashley D, Mowat C, Cahill A. Multicentre comparison of the Glasgow Blatchford and Rockall scores in the prediction of clinical end-points after upper gastrointestinal haemorrhage. Aliment Pharmacol Ther. 2011; 34(4):470-5.
26. Lin HJ, Wang K, Perng CL, Lee FY, Lee CH, Lee SD. Natural history of bleeding peptic ulcers with a tightly adherent blood clot: a prospective observation. Gastrointest Endosc. 1996; 43(5):470-3.