Hospitalized Incidence and Outcomes of Upper Gastrointestinal Bleeding in Thailand

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Background: *Upper gastrointestinal bleeding (UGIB) is a common emergency gastrointestinal problem which has substantial mortality and health care resources use. The nationwide basic information on UGIB is not available in Thailand.*
Objective: *To identify the hospitalized incidence, outcomes and hospitalization cost of patients who presented with UGIB in Thailand.*
Material and Method: *Information on illness of in-patients from hospitals nationwide was retrieved from three major health schemes database in fiscal year 2010.*
Results: *The hospitalized incidence rate of UGIB was 166.3 admissions per 100,000 populations and the hospitalized incidence rate of non-variceal upper gastrointestinal bleeding (NVUGIB) and variceal bleeding were 152.9 and 13.5 admissions per 100,000 populations respectively. Endoscopic procedure was undertaken in 27.6% of NVUGIB admissions and 80.7% of variceal bleeding admissions. The in-hospital mortality rate, hospitalization cost and length of stay were higher in variceal bleeding patients compared with NVUGIB patients.*
Conclusion: *UGIB is an important emergency gastrointestinal problem which has significant mortality and substantial health care resources consumption.*

Keywords: *Gastrointestinal hemorrhage, Upper gastrointestinal bleeding, Peptic ulcer bleeding, Variceal bleeding, Health care costs, Epidemiology*

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Upper gastrointestinal bleeding (UGIB) is a common emergency gastrointestinal problem which has significant mortality and health care resource use[1,2]. The hospitalized incidence of UGIB in Europe is approximately 50-130 per 100,000 populations[3,4]. The most common cause of UGIB in Thailand and other countries is non-variceal upper gastrointestinal bleeding (NVUGIB), specifically peptic ulcer[5-9]. The 30 days mortality rate of NVUGIB patients at Siriraj Hospital, Thailand, was 5.5%[10]. Variceal bleeding is also one of the common causes of UGIB[11] and responsible for 38.4% of UGIB patients who needed emergency esophagogastroduodenoscopy (EGD) outside official hours[9].

The nationwide basic epidemiology and economic information on UGIB is lacking. The purposes of the present study are to identify the hospitalized incidence, outcomes and healthcare cost of the patients who presented with UGIB in Thailand.

Material and Method

Data were retrieved from in-patient Medical Expensing Forms for the fiscal year 2010 (October 1, 2009 and September 30, 2010) from the Universal Coverage Scheme from the National Health Security Office (NHSO) and the Social Security Scheme from the Social Security Office; and in-patient data from the Civil Servant Medical Benefit Scheme from the Comptroller General's Department, Thailand.

Adult patients who had UGIB as a principal diagnosis were included in the present study. The

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International Classification of Disease, 10th edition (ICD-10) codes for NVUGIB included; Mallory-Weiss syndrome (K22.6); haemorrhage of oesophagus NOS (K22.8); gastric ulcer bleeding (K25.0, K25.2, K25.4, K25.6); duodenal ulcer bleeding (K26.0, K26.2, K26.4, K26.6); acute haemorrhagic gastritis (K29.0); peptic ulcer bleeding (K27.0, K27.2, K27.4, K27.6); bleeding from anastomotic ulcers, *i.e.* gastrojejunal (K28.0, K28.2, K28.4, K28.6); haematemesis (K92.0); and melaena (K92.1).The ICD-10 codes for variceal bleeding included; esophagealvarices with bleeding (I85.0); esophagealvarices with bleeding in diseases classified elsewhere (I98.3); gastric varices (I86.4) in combination with haematemesis (K92.0) or melaena (K92.1).

Baseline characteristics of patients presented with NVUGIB and variceal bleeding including age, gender, level of hospital, hospitalized incidence, in-hospital mortality rate, lengthof stay and cost of hospitalization were captured from the database.

The explanation of variables, tables of frequency enumeration and interrelationships were calculated using the SPSS program. The present study was approved by the Khon Kaen University ethics committee for human research under the respect of Helsinki Declaration.

Results

From October 1, 2009 to September 30, 2010, there were 77,111 hospital admissions for adult patients who presented with UGIB as the principal diagnosis. NVUGIB and variceal bleeding are responsible for 70,868 and 6,243 hospital admissions respectively. The mean age of the patient was 58.5 years. The percentage of male and female patients was 69.2 and 30.8 respectively. The common etiologies of UGIB were unspecified gastrointestinal haemorrhage, gastric ulcer bleeding, variceal bleeding and acute haemorrhagic gastritis (Table 1).

Non-variceal upper gastrointestinal bleeding

The hospitalized incidence rate of NVUGIB was 166.3 admissions per 100,000 populations and the incidence increased with age (Fig. 1).

Approximately 40% of the patients who presented with NVUGIB were admitted to primary care hospital. Overall EGD was performed in 27.6% of the patients. The mortality rate was highest and length of stay was longest in the patients who admitted to tertiary care hospital (Table 2).

NVUGIB patients with comorbidities; heart disease (I00-I99), malignancy (C00-C97), liver disease (K70-K77), obstructive pulmonary disease (J40-J44), and renal failure (N17-N19), had higher in-hospital mortality rate compared with those without co-morbidities (5.3% versus 3.9%; p = 0.001). In addition, the hospitalization cost of patients who had comorbidities was higher than those without comorbidities (17,972 versus 14,501 Baht; p = 0.001).

Variceal bleeding

The hospitalized incidence rate of the patients presented with UGIB from variceal bleeding was 13.5 admissions per 100,000 populations. The etiologies of variceal bleeding were bleeding esophageal varices, 6,201 admissions (99.3%) and bleeding gastric varices, 42 admissions (0.7%).

In contrast to NVUGIB, eighty-six percent of the patients admitted to secondary and tertiary care hospital. Overall esophagogastroduodenoscopy (EGD) had been performed in 80.7% of the patients. The mortality rate was highest and length of stay was longest in tertiary care hospital compared with the others (Table 3).

Comparing between esophageal and gastric variceal bleeding, the length of hospital stay was significantly longer in gastric variceal bleeding. Moreover, the hospitalization cost was also significantly higher in gastric variceal bleeding. However, the in-hospital death rate was not different between two groups (Table 4).

Discussion

The present study provided the nationwide epidemiologic and economic information of UGIB in Thailand. The hospitalized incidence rate of UGIB was 166.3 admissions per 100,000 populations and the hospitalized incidence rate of NVUGIB and variceal bleeding were 152.9 and 13.5 admissions per 100,000

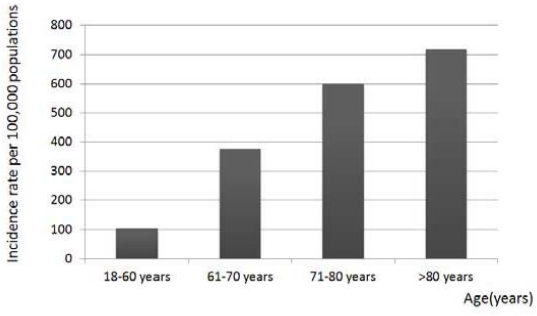

Fig. 1 Hospitalized incidence rate per 100,000 populations by age group

Table 1. Etiologies of upper gastrointestinal bleeding

Diagnosis	Number (%)
Unspecified gastrointestinal haemorrhage (K92.2)	43,759 (56.75)
Gastric ulcer bleeding (K25.0, K25.2, K25.4, K25.6)	8,299 (10.76)
Variceal bleeding (I85.0, I98.3, I86.4 with K92.0 or K92.1	6,243 (8.10)
Acute haemorrhagic gastritis (K29.0)	5,420 (7.03)
Haematemesis (K92.0)	4,053 (5.26)
Melaena (K92.1)	3,706 (4.81)
Duodenal ulcer bleeding (K26.0, K26.2, K26.4, K26.6)	3,477 (4.51)
Peptic ulcer bleeding (K27.0, K27.2, K27.4,K27.6)	1,163 (1.51)
Mallory–Weiss syndrome (K22.6)	842 (1.09)
Haemorrhage of oesophagus NOS (K22.8)	107 (0.14)
Bleeding from anastomotic ulcers (K28.0, K28.2, K28.4, K28.6)	42 (0.04)

Table 2. Outcomes of the patients presented with NVUGIB classified according to the level of hospital

	Primary care hospital	Secondary care hospital	Tertiary care hospital	Private Hospital	Total
Number of admission	29,159	19,090	18,103	4,516	70,868
Number of EGD (%)	1,296 (6.6)	6,136 (31.4)	10,289 (52.7)	1,805 (40.0)	19,526 (27.6)
In-hospital deaths per 100 admissions	0.81	6.79	7.39	2.44	4.1
Length of stay (day, mean (SD))	3.1 (2.9)	4.7 (4.9)	5.0 (6.1)	4.2 (3.6)	4.1 (4.6)
Hospitalization cost (Baht, mean (SD))	6,322 (9,487)	16,920 (24,316)	23,732 (47,995)	36,617 (40,783)	15,236 (30,979)

EGD, esophagogastroduodenoscopy; SD,standard deviation

Table 3. Outcomes of the patients presented with variceal bleeding classified according to the level of hospital

	Primary care hospital	Secondary care hospital	Tertiary care hospital	Private hospital	Total
Number of admission	413	1,961	3,425	444	6,243
Number of EGD (%)	187 (45.2)	1,560 (79.6)	2,968 (86.7)	325 (73.2)	5,040 (80.7)
In-hospital deaths per 100 admissions	6.3	11.9	12.4	10.5	9.9
Length of stay (days, mean(SD))	4.8 (4.3)	5.5 (4.6)	5.8 (5.5)	6.2 (4.3)	5.7 (5.1)
Hospitalization cost (Baht, mean(SD))	25,425 (36,198)	39,116 (38,324)	48,204 (47,946)	81,739 (68,900)	46,188 (47,736)

EGD, esophagogastroduodenoscopy; SD,standard deviation

populations respectively. The incidence was high compared to those in Europe[3,4] and the incidence was increased with age.

Second to unspecified gastrointestinal haemorrhage, the most common etiology of UGIB was peptic ulcer bleeding including gastric ulcer, duodenal ulcer and unspecified peptic ulcer bleeding which was similar to other studies[11]. The fact that the diagnosis of unspecified gastrointestinal haemorrhage was very high in this study could be explained by the very low

Table 4. Compare the outcomes of bleeding from esophageal varices and gastric varices

	Esophageal variceal bleeding (n = 6,201)	Gastric variceal bleeding (n = 42)	p
Age (years)	51.6 (11.5)	53.0 (14.7)	0.433
In-hospital deaths per 100 admissions	9.85	11.9	0.657
Length of stay(days, mean(SD))	5.7 (5.1)	7.4 (5.4)	0.031
Hospitalization cost (Baht, mean(SD))	46,187 (47,736)	70,516 (48,555)	0.001

SD, standard deviation

rate of EGD which was only 27.6% of the total admissions of NVUGIB patients. This practice is contrast to the recommendation of the practice guideline which recommended early EGD in patients with UGIB[12,13].

In contrast to NVUGIB patients, the percentage of hospital admission to primary care hospital of variceal bleeding patients was quite low. This finding may be explained by the fact that the majority of variceal bleeding patients were referred to secondary or tertiary care hospital after resuscitation without in-patients admission to primary care hospital because patients with variceal bleeding usually need the specific medication and endoscopic therapy which were available at the referral hospitals.

The mortality rate of NVUGIB patients was close to the previous reported[7,14]. The highest mortality rate was observed in the patients admitted to tertiary care hospital which was the referral center that managed severe or complicated UGIB cases. The in-hospital death rate of patients with variceal bleeding was higher than NVUGIB patients. Patients with gastric variceal bleeding consumed more health care resources than those with bleeding esophageal varices. This finding might reflect the severity of patients with gastric variceal bleeding.

Cost of treatment was related to the level of hospital in both NVUGIB and variceal bleeding groups. These finding could be explained by the fact that the high level hospital or referral hospital had higher labor cost and higher depreciation expense of the advanced equipment compared to the low level hospital. In addition, the high level hospital usually take care of the complicated or severe UGIB patients who consumed more health care resources compared with simple cases. According to the results of the present study, there are several measures to improve the health care service and outcomes of the treatment of NVUGIB patients. First, because almost half of the patients presented at primary care hospital, the resources and knowledge of management for low risk UGIB patients and the efficient referral system for high risk UGIB patients should be available at primary care hospital. Second, the diagnostic and therapeutic EGD should be available for all UGIB patients in appropriate timing at secondary care and tertiary care hospital to obtain the correct diagnosis, reduce the length of stay and ultimately, improve the outcomes of the patients. Besides, the percentage of unspecified diagnosis such as unspecified gastrointestinal haemorrhage (K92.2), haematemesis (K92.0) and melaena (K92.1) would be reduced. In addition, the authors could improve the health care service and outcomes of treatment for patients with variceal bleeding by; first, essential medical treatment and efficient referral system should be available at primary care hospital for safety transfer of the patients to the higher level hospitals. Second, according to the international guidelines[15,16], the diagnostic and therapeutic EGD should be provided for all patients presenting with acute variceal bleeding who do not have contraindications in appropriate timing at secondary care or tertiary care hospital to improve the outcomes of the patients.

There are some limitations of the present study. First, the calculation is based on the number of admissions. Second, the authors included only the patients presented with UGIB as the principal diagnosis; therefore, patients who had UGIB during hospital admission from other diseases were not included in the present study. Third, there is the potential for misclassification of diagnosis in summary discharge form and coding. Therefore the results of the present study should be interpreted within the context of these limitations.

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Potential conflicts of intereset

None.

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อุบัติการณ์และผลการรักษาภาวะเลือดออกจากทางเดินอาหารส่วนต้นในประเทศไทย

อภิชาติ แสงจันทร์, คู่ขวัญ สวัสดิ์พาณิชย์, พิศาล ไม้เรียง,กิตติ จันทร์เลิศฤทธิ์, วัฒนา สุขีไพศาลเจริญ, สุมิตร สุตรา, ยุพา ถาวรพิทักษ์

***ภูมิหลัง**: ภาวะเลือดออกจากทางเดินอาหารส่วนต้นเป็นภาวะฉุกเฉินของโรคระบบทางเดินอาหารที่พบบ่อย และใช้ทรัพยากรทางการแพทย์ในการรักษาโรคจำนวนมาก ข้อมูลพื้นฐานของภาวะนี้ในประเทศไทยยังมีไม่เพียงพอ*

***วัตถุประสงค์**: เพื่อทราบความชุกของการเข้านอนพักรักษาในโรงพยาบาล ผลการรักษาและค่าใช้จ่ายในผู้ป่วยที่มีภาวะเลือดออกจากทางเดินอาหารส่วนต้นในประเทศไทย*

***วัสดุและวิธีการ**: ข้อมูลการเจ็บป่วยของผู้ป่วยในจากฐานข้อมูลของระบบประกันสุขภาพหลัก 3 แหล่งของประเทศไทย ประจำปีงบประมาณ พ.ศ. 2553*

***ผลการศึกษา**: ความชุกของการเข้านอนพักรักษาในโรงพยาบาลของผู้ป่วยที่มีภาวะเลือดออกจากทางเดินอาหารส่วนต้นเท่ากับ 166.3 ครั้งต่อประชากร 100,000 คน โดยความชุกของการเข้านอนพักรักษาในโรงพยาบาลของผู้ป่วยที่มีภาวะเลือดออกจากทางเดินอาหารส่วนต้นจากเส้นเลือดขอดและไม่ได้เกิดจากเส้นเลือดขอดเท่ากับ 13.5 และ 152.9 ครั้งต่อประชากร 100,000 คนตามลำดับ ผู้ป่วยที่มีภาวะเลือดออกที่ไม่ได้เกิดจากเส้นเลือดขอดได้รับการส่องกล้องตรวจร้อยละ 27.6 ส่วนผู้ป่วยที่มีภาวะเลือดออกจากเส้นเลือดขอดได้รับการส่องกล้องตรวจร้อยละ 80.7 ผู้ป่วยที่มีภาวะเลือดออกจากทางเดินอาหารส่วนต้นจากเส้นเลือดขอดมีอัตราตายในโรงพยาบาล ค่ารักษาพยาบาล และระยะเวลานอนโรงพยาบาลมากกว่าผู้ป่วยที่มีภาวะเลือดออกจากทางเดินอาหารส่วนต้นที่ไม่ได้เกิดจากเส้นเลือดขอด*

***สรุป**: ภาวะเลือดออกจากทางเดินอาหารส่วนต้นเป็นภาวะฉุกเฉินของโรคระบบทางเดินอาหารที่พบบ่อย มีอัตราตายในโรงพยาบาลและมีการใช้ทรัพยากรทางการแพทย์ในการรักษาโรคสูง*