

การใช้ Blatchford score ในการทำนายการรักษาโดยการส่องกล้องหยุดเลือด ในผู้ป่วยเลือดออกในทางเดินอาหารส่วนต้นที่ห้องฉุกเฉิน โรงพยาบาลสงขลานครินทร์

ปณิตา วรปรัชญา^{1*}
 ประสิทธิ์ วุฒิสุทธิเมธาวิ¹
 ประเสริฐ วศินาอนุกร¹
 อลัน เฟรเดอริก กีเตอร์²

Blatchford Score to Predict Necessary Endoscopic Treatment in Upper Gastrointestinal Bleeding Patients in the Emergency Department at Songklanagarind Hospital.

Panita Worapratya¹, Prasit Wuthisuthimethawee¹, Prasert Vasinanukorn¹, Alan F. Geater²

¹Department of Emergency Medicine, ²Epidemiology Unit, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand.

*E-mail: pikkokung@yahoo.com

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บทคัดย่อ:

ปุมหลัง: ผู้ป่วยเลือดออกในทางเดินอาหารส่วนต้นพบได้บ่อยในห้องฉุกเฉิน และเกือบทั้งหมดของผู้ป่วยเหล่านี้มักจำเป็นต้องรับไว้สังเกตอาการในโรงพยาบาล เนื่องจากยังไม่มีวิธีการคัดแยกผู้ป่วยที่เป็นมาตรฐานในปัจจุบัน Blatchford score เป็นวิธีการคัดแยกผู้ป่วยวิธีหนึ่งซึ่งได้รับการยอมรับมากที่สุด เนื่องจากใช้ข้อมูลจากอาการและผลทางห้องตรวจปฏิบัติการเบื้องต้นซึ่งสามารถใช้ได้จริงในห้องฉุกเฉิน อย่างไรก็ตามยังไม่มีหลักฐานแน่ชัดว่า Blatchford score สามารถใช้ในการจำแนกผู้ป่วยเลือดออกในทางเดินอาหารส่วนต้นได้จริง

วัตถุประสงค์: การศึกษานี้จึงทำขึ้นเพื่อหาค่าคะแนนที่เหมาะสมที่สุด เพื่อใช้ในการคัดแยกผู้ป่วยว่ารายใดมีความเสี่ยงที่จำเป็นต้องใช้การส่องกล้องเพื่อหยุดเลือดออกในทางเดินอาหารส่วนต้น

¹ภาควิชาเวชศาสตร์ฉุกเฉิน ²หน่วยระบาดวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์

อ.หาดใหญ่ จ.สงขลา 90110

รับต้นฉบับวันที่ 21 มิถุนายน 2555 รับลงตีพิมพ์วันที่ 19 กันยายน 2555

วัตถุประสงค์และวิธีการ: เก็บข้อมูลวิจัยแบบสังเกตการณ์ เก็บรวบรวมข้อมูลไปข้างหน้า โดยรวบรวมผู้ป่วยที่มีตั้งแต่ 16 ปีขึ้นไป
ที่มาใช้บริการที่ห้องฉุกเฉินด้วยเลือดออกในทางเดินอาหารส่วนต้น ระหว่างวันที่ 1 มกราคม พ.ศ. 2550 ถึง 31
ธันวาคม พ.ศ. 2551

ผลการศึกษา: มีผู้ป่วยรวมทั้งสิ้น 240 ราย เป็นผู้ป่วยชาย 193 ราย (ร้อยละ 80.4) โดยมีค่าเฉลี่ยของ Blatchford
score เท่ากับ 10.6 คะแนน และมีค่าเบี่ยงเบนมาตรฐานเท่ากับ 4.1 ในจำนวนทั้งหมดนี้ มีผู้ป่วยเพียง 116 ราย
(ร้อยละ 48.3) เท่านั้นที่ได้รับการส่องกล้องทางเดินอาหารเพื่อห้ามเลือด (endoscopic treatment) และพบว่าผู้ป่วย
ที่มี Blatchford score น้อยกว่า 3 ในการศึกษาทั้งหมดนี้ 11 ราย ไม่มีรายใดเลยที่ต้องได้รับการส่องกล้องเพื่อ
ห้ามเลือด หรือผ่าตัดเพื่อหยุดเลือด และไม่มีผู้ใดเสียชีวิตในกลุ่มนี้

สรุป: Blatchford score อาจสามารถนำมาประยุกต์ใช้ในการทำนายความเสี่ยงที่ผู้ป่วยจะต้องถูกส่องกล้องเพื่อหยุด
เลือดได้ โดยผู้ป่วยที่มี Blatchford score น้อยกว่าหรือเท่ากับ 3 ในการศึกษาไม่มีผู้ป่วยรายใดที่เสียชีวิต หรือ
ได้รับการส่องกล้องเพื่อหยุดเลือดเลย

คำสำคัญ: เลือดออกในทางเดินอาหารส่วนต้น, Blatchford score

Abstract:

Background: Patients with upper gastrointestinal bleeding (UGIB) are usually admitted to hospital
due to a lack of standardized risk stratification protocol for determining the severity of bleeding.
There are several risk scores for risk stratification in UGIB patients. The Blatchford score, which
relies only on clinical and laboratory parameters, is practical in the emergency setting. However,
appropriate cut points of the Blatchford score have not been identified yet.

Objective: This study aims to determine the validity of the Blatchford score to predict necessary
endoscopic treatment of patients with upper gastrointestinal bleeding in the Emergency Department
at Songklanagarind Hospital.

Materials and methods: This is a prospective observational study on patients aged 16 years and
older who presented in Songklanagarind Hospital Emergency Department from 1 January 2008 to
31 December 2009 and finally diagnosed with upper gastrointestinal bleeding. Blatchford scores
were calculated for each enrolled patient. Endoscopic treatment was noted as the end point of this
study to determine the validity of the Blatchford score at each point in the scoring system.

Results: There were 240 patients enrolled including 193 (80.4%) men. The mean Blatchford score
was 10.6 ± 4.1 . Two hundred and four patients underwent endoscopy which was necessary for 116
(56.9%) patients and 11 patients who did not require endoscopic treatment had a Blatchford score
of less than 3. The negative predictive value of those 11 patients was 100%.

Conclusion: The Blatchford score can be used for initial risk stratification in upper gastrointestinal
bleeding in the emergency setting. The data show that the patients who had Blatchford scores less
than 3 did not require endoscopic treatment.

Key words: Blatchford score, upper gastrointestinal bleeding

Introduction

Acute upper gastrointestinal bleeding (UGIB) is one of the most common presentations in the Emergency Department which results in hospital admissions.¹ Even though the bleeding for most of these patients is self-limited, some cases are serious and some patients die. Several previous studies have shown that the rates of major morbidities and mortalities are between 8 and 12% and have remained fairly constant during the past 40 years.²⁻⁴ There is much research about the parameters to predict poor outcomes of UGIB patients, but there is no single standardized and widespread predictor being used.⁵⁻¹² The Rockall score, which consists of a clinical score and endoscopic finding, is most reliable in predicting mortality in UGIB patients.¹²⁻¹⁴ Songklanagarind Hospital is a tertiary care center in

the southern part of Thailand. The Emergency Department of Songklanagarind Hospital has approximately 30 UGIB patients a month. However, since endoscopy is not available in the emergency room patients need to be admitted into the hospital for endoscopy. Therefore, the admission rate of UGIB patients at this hospital is nearly 100% with an average cost per admission of 58,800 Thai Baht (1,896 USD) and a median length of stay of 5 days. The Blatchford score (Table 1), which is based only on clinical and laboratory data, has good reliability for use in risk stratification in UGIB patients.¹⁵ However, an appropriate cut point of the Blatchford score has not yet been identified. This study aims to determine the validity of the Blatchford score to predict necessary endoscopic treatment in patients with UGIB in the Emergency Department setting.

Table 1 Blatchford scoring system

Admission risk marker	Score component value					
	0	1	2	3	4	6
Blood urea (mg/dl)	<6.5	-	≥6.5<8.0	≥8.0<10.0	≥10.0<24.0	≥24.0
Hemoglobin (g/dl) for males	≥13.0	≥12.0<13.0	-	≥10.0<12.0	-	<10.0
Hemoglobin (g/dl) for females	≥12.0	≥10.0<12.0	-	-	-	<10.0
Systolic blood pressure (mmHg)	≥109	≥100<109	≥90≤99	<90	-	-
Pulse (per min)	<100	≥100	-	-	-	-
Presentation with melena	No	Yes	-	-	-	-
Presentation with syncope	No	-	Yes	-	-	-
Complicated by hepatic disease	No	-	Yes	-	-	-
Complicated by cardiac failure	No	-	Yes	-	-	-

Materials and methods

A prospective study was conducted in the Emergency Department at Songklanagarind Hospital from 1 January 2008 to 31 December 2009. Patients aged 16 years and older who presented with symptoms of UGIB including haematemesis, melena, haematochezia other signs and symptoms such as fainting and finally diagnosed with UGIB were enrolled in this study. The research was approved by the Institutional Ethics Committee of the Faculty of Medicine, Songklanagarind Hospital.

Data were collected using a standard protocol and included demographic characteristics, symptoms and signs of presentation, history of peptic ulcer and/or liver disease, coexisting illness, drug history, initial vital signs, content from nasogastric aspiration, laboratory results, Blatchford score, volume resuscitation, transfusion requirement, cardiopulmonary resuscitation required, endoscopic findings and treatment, medical treatment, surgical treatment, final diagnosis, complications, duration of hospital admission, results of treatment and death.

Endoscopic findings were recorded according to the Forrest classification.¹⁶ Endoscopic treatments were noted as adrenaline injection, sclerosant injection, thrombin injection, Histoacryl injection, hemoclips placement and band ligation. Final diagnoses were recorded according to the discharge summary notes following International Classification of Diseases (ICD) 10. The results of treatment were noted as 1) improved group defined as vital signs stable, bleeding stopped, and finally could be discharge home and 2) death group, which included both

in-hospital and out-of-hospital deaths. All data were collected and analyzed by using the R program version 2.14. Data including age, sex, underlying disease and laboratory results were presented as descriptive data in percentage and mean or median. A univariate analysis was conducted to assess the Blatchford scoring system.

Results

Demographic data

There were 240 patients enrolled in this study: 193 (80.4%) men and 47 (19.6%) women. There were 112 (46.7%) variceal bleeding cases. Among the 128 non-variceal bleeding patients, most were gastric ulcer (28, 11.7%) and duodenal ulcer (23, 9.6%), followed by esophagitis, gastritis and duodenitis (20, 8.3%), upper gastrointestinal ulcer (6, 2.5%), Mallory-Weiss tear (4, 1.7%), Dieulafoy's lesion (1, 0.4%) and others (5, 2.1%). One hundred and thirty eight patients (57.5%) of the study group had liver disease. Forty-one (17.1%) patients had diabetes, 31 (12.9%) had hypertension, 27 (11.3%) had malignancy, 20 (8.3%) had renal failure, and 17 (7.1%) patients had heart disease.

Clinical presentation

The most common presentations were vomiting fresh blood (37.5%) or vomiting coffee ground material (19.6%) followed by passing dark tarry stool (28.8%). Other presentations included malaise and fainting without passing blood in the stool or vomiting (11.3%). Only half of these cases (5.02%) had a previous history of bleeding, of which 82 cases had a variceal bleeding history. The common risk factors were non-steroidal

anti-inflammatory drug (NSAID) use (15.4%) and anticoagulant use (11.3%).

Half of the UGIB patients (48.3%) had stable vital signs on initial presentation with systolic blood pressure greater than or equal to 110 mmHg and 132 (55%) patients had a pulse rate less than 100 beats/minute. More than 80% of these patients had initial positive nasogastric lavage: coffee ground material group (50.8%) and fresh blood group (32.4%). The number of patients requiring endoscopic treatment was 48 (39.3%) in the coffee ground material group and 59 (72.0%) in the fresh blood group. Among the negative nasogastric tube patients, there were 30 (12.5%) cases of clear content and 6 (2.5%) cases with presence of bile content, of which 6 cases out of the 30 with clear content required endoscopic treatment. There were 165 cases without melena on digital rectal examination, but among this group, 89 cases required endoscopic treatment. One hundred and five patients presented with chronic liver stigmata. In this group 71 cases required endoscopic treatment versus 45 cases among the patients with an absence of chronic liver stigmata.

Laboratory findings

The mean values of blood tests revealed an initial hemoglobin concentration of 9 ± 3.7 g/dl, platelet concentration of $165,000\pm 107,000/\mu\text{l}$, blood urobilinogen of 34 ± 27 mg/dl and creatinine of 1.4 ± 1.7 mg/dL. There was no statistical significance between low hemoglobin concentration or high creatinine and requiring endoscopic treatment

Specific treatment of UGIB

All patients received medical treatment such as proton-pump inhibitor (92.5%), H₂-blocker (6.6%) and octreotide (56.3%). There were 5 (2.1%) cases that required Sengstaken-Blakemore tubes, 6 (2.5%) cases required surgical treatment to stop bleeding and 116 (48.3%) cases required endoscopic treatment. Among all of the 204 endoscopic patients, there were 78 (38.9%) cases that showed no stigmata. Seventy-two (35.3%) cases had haematin covered flat spot followed by sentinel clot (8.8%), visible vessel (5.8%), arterial spurting (4.9%) and arterial oozing (4.4%).

Results of treatment

The average and median lengths of stay were 7 ± 9 days and 5 days, while the average and median costs of hospital stay were $1,896\pm 2,685$ USD and 1,041 USD. Two hundred and thirteen cases (88.8%) improved and could be discharged home, 6 (2.5%) cases had rebleeding within 24 hours, 1 case had rebleeding within a week and 3 (1.3%) cases had on-going bleeding. Sixteen (16.7%) cases died in hospital, and 11 (4.6%) cases were discharged to die at home due to high severity and untreatable underlying disease and advanced age.

The mean Blatchford score of the study population was 10.6 ± 4.1 . There were 116 (48.3%) patients who underwent endoscopy and all required endoscopic treatment (Table 2). There were 11 patients with a Blatchford score of less than 3 who did not need endoscopic treatment, blood transfusion, nor surgical intervention and there were no adverse outcomes such as death

or rebleeding. The positive predictive value of a Blatchford score cut point of ≤ 2 was 50.7% and the negative predictive value was 100%. Among the 240 cases who had a Blatchford score of more than 3, 109 (91.4%) cases improved, 9 (7.8%) cases were admitted in the intensive care unit, 5 (4.3%) had rebleeding within 24 hours, 1 (0.9%) case had rebleeding within a week and 10 (8.6%) died.

Discussion

Acute UGIB is a common and life-threatening problem in the Emergency Department. Several systems for risk stratification have been developed, which vary in how and when to apply the systems for acute UGIB. Some can aid in the decision for needing hospitalization at the time of endoscopy,¹⁰ length of hospital stay¹⁷ and poor outcome.¹¹ Among these scoring systems,

Table 2 Relationship between necessary/not necessary endoscopic treatment and the Blatchford score

Blatchford score	Endoscopic treatment		Total	Sensitivity	Specificity	Accuracy	PPV (%)	NPV (%)
	Necessary	Not Necessary						
0	0 (0.0)	5 (4.0)	5 (2.1)	100.0	4.0	50.4	49.4	100.0
1	0 (0.0)	2 (1.6)	2 (0.8)	100.0	5.6	51.3	49.8	100.0
2	0 (0.0)	4 (3.2)	4 (1.7)	100.0	8.9	52.9	50.7	100.0
3	1 (0.9)	4 (3.2)	5 (2.1)	99.1	12.1	54.2	51.3	93.8
4	3 (2.6)	4 (3.2)	7 (2.9)	96.6	15.3	54.6	51.6	82.6
5	3 (2.6)	3 (2.4)	6 (2.5)	94.0	17.7	54.6	51.7	75.9
6	2 (1.7)	5 (4.0)	7 (2.9)	92.2	21.8	55.8	52.5	75.0
7	6 (5.2)	6 (4.8)	12 (5.0)	87.1	26.6	55.8	52.6	68.8
8	7 (6.0)	13 (10.5)	20 (8.3)	81.0	37.1	58.3	54.7	67.6
9	3 (2.6)	8 (6.5)	11 (4.6)	78.4	43.5	60.4	56.5	68.4
10	14 (12.1)	10 (8.1)	24 (10.0)	66.4	51.6	58.8	56.2	62.1
11	8 (6.9)	15 (12.1)	23 (9.6)	59.5	63.7	61.7	60.5	62.7
12	15 (12.9)	15 (12.1)	30 (12.5)	46.6	75.8	61.7	64.3	60.3
13	16 (13.8)	8 (6.5)	24 (10.0)	32.8	82.3	58.3	63.3	56.7
14	14 (12.1)	6 (4.8)	20 (8.3)	20.7	87.1	55.0	60.0	54.0
15	11 (9.5)	8 (6.5)	19 (7.9)	11.2	93.5	53.8	61.9	53.0
16	8 (6.9)	1 (0.8)	9 (3.8)	4.3	94.4	50.8	41.7	51.3
17	3 (2.6)	3 (2.4)	6 (2.5)	1.7	96.8	50.8	33.3	51.3
18	2 (1.7)	3 (2.4)	5 (2.1)	0.0	99.2	51.3	0.0	51.5
19	0 (0.0)	1 (0.8)	1 (0.4)	-	-	-	-	-

PPV = positive predictive value NPV = negative predictive value

the Rockall and Blatchford scoring systems are applied most often. However, the Rockall scoring system is not practical in cases where endoscopy is not available.

The Blatchford score is based only on clinical and laboratory data; therefore, it is practical in the emergency setting. The endpoint of this study concentrates on endoscopic treatment, because endoscopic treatment is a standard treatment. It provides effective treatment that can decrease the risks of blood transfusions and death. Moreover endoscopic treatment has an influence on patient disposition. The goal of this study was to assess the utility of the Blatchford score to predict the need for endoscopic treatment in patients with upper gastrointestinal bleeding in the Emergency Room setting. In this prospective study of 240 patients, no one with a Blatchford score equal to or less than 2 points required endoscopic treatment and neither rebleeding nor death occurred.

This study shows that the Blatchford score is practical as a screening tool in an emergency department for risk stratification and disposition in patients with upper gastrointestinal bleeding, because none of the patients with a Blatchford score of less than 3 required any endoscopic treatment, blood transfusion or surgical intervention. Using a cut point in the Blatchford score of ≤ 2 to determine low risk patients of 100% in this study is compatible with the results from two previous studies by Masaoka et al.¹⁸ and Stephens et al.¹⁹ Two other studies of Stanley et al.²⁰ and Chandra et al.²¹ mention low risk criteria at a negative predictive value of 100% when the Blatchford score was zero^{20,21} (Table 3).

Table 3 Comparison of negative predictive values at cut points of 2 and less

Studies	Cut point of the Blatchford score	Negative predictive value
This study	2	100
Masaoka ¹⁸	2	100
Stanley ²⁰	0	100
Chandra ²¹	0	100

Songklanagarind Hospital is a tertiary care facility that receives all referral cases from rural hospitals in southern Thailand. Because endoscopy is not available in the Emergency Department at the hospital, admission all of patients who present with upper gastrointestinal bleeding patient consumes a lot of resources which should be reserved for the more serious patients. In order to reduce overutilization of equipment and personnel, low risk patients defined as those with a Blatchford score of <3 should be admitted into the Short Stay Observation Unit while waiting for endoscopy for risk stratification.

Conclusion

The Blatchford score can be used for initial clinical risk stratification in upper gastrointestinal bleeding in the emergency setting where endoscopy is not available. Although our data show that the patients who had Blatchford scores less than 3 did not need endoscopic treatment, there are some studies that indicate scores lower than 3 may need endoscopic treatment in some specific patients.²⁰⁻²¹ Therefore, this study does not imply

direct discharge of low risk patients. We suggest that all patients with upper gastrointestinal bleeding receive endoscopy for risk stratification.

References

1. Friedman LS, Martin P. The problem of gastrointestinal bleeding. *Gastroenterol Clin North Am* 1993; 22: 717 - 21.
2. Gilbert DA. Epidemiology of upper gastrointestinal bleeding. *Gastrointest Endosc* 1990; 36 (Suppl 5): S8 - 13.
3. Allan R, Dykes P. A study of the factors influencing mortality rates from gastrointestinal haemorrhage. *Q J Med* 1976; 45: 533 - 50.
4. Longstreth GF. Epidemiology of hospitalization for acute upper gastrointestinal hemorrhage: a population-based study. *Am J Gastroenterol* 1995; 90: 206 - 10.
5. Jones FA. Hematemesis and melena; with special reference to causation and to the factors influencing the mortality from bleeding peptic ulcers. *Gastroenterology* 1956; 30: 166 - 90.
6. MacLeod IA, Mills PR. Factors identifying the probability of further haemorrhage after acute upper gastrointestinal haemorrhage. *Br J Surg* 1982; 69: 256 - 8.
7. Park KG, Steele RJ, Mollison J, et al. Prediction of recurrent bleeding after endoscopic haemostasis in non-variceal upper gastrointestinal haemorrhage. *Br J Surg* 1994; 81: 1465 - 8.
8. Storey DW, Bown SG, Swain CP, et al. Endoscopic prediction of recurrent bleeding in peptic ulcers. *N Engl J Med* 1981; 305: 915 - 6.
9. Yavorski RT, Wong RK, Maydonovitch C, et al. Analysis of 3,294 cases of upper gastrointestinal bleeding in military medical facilities. *Am J Gastroenterol* 1995; 90: 568 - 73.
10. Bordley DR, Mushlin AI, Dolan JG, et al. Early clinical signs identify low-risk patients with acute upper gastrointestinal hemorrhage. *JAMA* 1985; 253: 3282 - 5.
11. Rockall TA, Logan RF, Devlin HB, et al. Risk assessment after acute upper gastrointestinal haemorrhage. *Gut* 1996; 38: 316 - 21.
12. Rockall TA, Logan RF, Devlin HB, et al. Incidence of and mortality from acute upper gastrointestinal haemorrhage in the United Kingdom. Steering Committee and members of the National Audit of Acute Upper Gastrointestinal Haemorrhage. *BMJ* 1995; 311: 222 - 6.
13. Rockall TA, Logan RF, Devlin HB, et al. Selection of patients for early discharge or outpatient care after acute upper gastrointestinal haemorrhage. National Audit of Acute Upper Gastrointestinal Haemorrhage. *Lancet* 1996; 347: 1138 - 40.
14. Vreeburg EM, Terwee CB, Snel P, et al. Validation of the Rockall risk scoring system in upper gastrointestinal bleeding. *Gut* 1999; 44: 331 - 5.
15. Chen IC, Hung MS, Chiu TF, et al. Risk scoring systems to predict need for clinical intervention for patients with nonvariceal upper gastrointestinal tract bleeding. *Am J Emerg Med* 2007; 25: 774 - 9.
16. Forrest JA, Finlayson ND, Shearman DJ. Endoscopy in gastrointestinal bleeding. *Lancet* 1974; 2: 394 - 7.
17. Almela P, Benages A, Peiró S, et al. A risk score system for identification of patients with upper-GI bleeding suitable for outpatient management. *Gastrointest Endosc* 2004; 59: 772 - 81.
18. Masaoka T, Suzuki H, Hori S, et al. Blatchford scoring system is a useful scoring system for detecting patients with upper gastrointestinal bleeding who do not need endoscopic intervention. *J Gastroenterol Hepatol* 2007; 22: 1404 - 8.
19. Stephens JR, Hare NC, Warshow U, et al. Management of minor upper gastrointestinal haemorrhage in the community using the Glasgow Blatchford score. *Eur J Gastroenterol Hepatol* 2009; 21: 1340 - 6.

20. Stanley AJ, Ashley D, Dalton HR, et al. Outpatient management of patients with low-risk upper-gastrointestinal haemorrhage: multicentre validation and prospective evaluation. *Lancet* 2009; 373: 42 - 7.
21. Chandra S, Hess EP, Agarwal D, et al. External validation of the Glasgow-Blatchford Bleeding Score and the Rockall Score in the US setting. *Am J Emerg Med* [serial on the Internet]. 2012 Jun [cited 2011 Nov 15]; 30(5). Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21641145>