A Clinical Evaluation of AAB Scoring System in Surgical Practice and Some Statistical Tests for Clinical Implementation

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This study was conducted on a total number of 52 patients who were suspected as patients of acute abdominal bleeding preoperatively admitted in general surgery wards (No 11 and 12, Unit 2) of Khulna Medical College Hospital, Bangladesh. During the period of the study, 78.8% of study population was male and majority (96%) was in 30 to 59 years age group. In this clinical study, the newly proposed AAB scoring system was tried to be justified clinically among the 52 patients of suspected acute abdominal bleeding on the basis of sensitivity, specificity, predictive value of a positive test, predictive value of a negative test, percentage of false negatives and percentage of false positives where those were found to be 74%, 44%, 86%, 27%, 26% and 56% respectively.

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Introduction

Acute gastrointestinal (GI) hemorrhage is a frequent cause for admission to the surgical intensive care unit. Upper gastrointestinal (UGI) causes are more common (85%) than lower gastrointestinal (LGI) causes (15%). The likelihood that emergency surgery will be necessary is estimated at 40% for UGI sources and at 30% for LGI sources.[1] Clinically, the distinction between UGI and LGI sources is important.

Practically, LGI bleeding is hemorrhage that occurs beyond the range of the UGI endoscope. Fortunately, bleeding ceases in ~ 85% of patients without intervention. The remaining 15% of patients require early, accurate diagnosis and therapy.[2] In the United States, the estimated rate of hospitalization for UGI bleeding is ~100/100,000 patients per year. Typically, patients are .70 years of age and have one or more major chronic organ system diseases.[3] Patients hospitalized for another reason before significant bleeding begins have a mortality of 70%.[4] In the hospitalized patient, tachycardia, hypotension, or anemia should suggest the possibility of GI hemorrhage. The most common causes of UGI hemorrhage are esophageal varices, gastric ulcer, and duodenal ulcers. In two large series, these entities accounted for 20% of UGI bleeding sources.[4,5] Other causes included esophageal ulcers, malignant ulcers, hiatal herniae, and diverticula. Each of these entities was associated with a 5% chance of producing clinically significant hemorrhage. In the series of Chalmers et al. esophageal varices were demonstrated in 33 of 44 patients with cirrhosis.[5] In 16 of these 33 patients, no point of rupture of varices was found.

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UGI endoscopy can locate a bleeding lesion, assess the risk of rebleeding, and, with increasing frequency, control bleeding. With respect to locating the lesion, diagnostic accuracy of 90–95% is typical.[6,7] With respect to the risk of rebleeding, several observations have special importance. Active arterial bleeding with streaming of blood, clot adherence to a lesion, an exposed vessel that protrudes from the lesion, and staining of the ulcer base within a lesion are collectively known as stigmata of recent hemorrhage (SRH).[8]

Presence of SRH is associated with increased rebleeding risk and increased mortality. For ulcers actively bleeding at the time of endoscopy, the rebleeding rate has been reported to range from 53% to 100%. For collected series, the mean rate is 66%.[9] For patients with visible vessels in ulcers, the rebleeding rate is ~50%, and the emergency surgery rate has been reported at 52%.[9,10] Other SRH have a lower incidence of rebleeding, ~10%.[10] In one large series, mortality for patients with SRH was 12%; whereas, for patients without SRH, the mortality was 0%.[11] Early endoscopy in acutely bleeding patients presumably would have several advantages.

First, surgery, when indicated, would be performed earlier. With more rapid definitive surgery, the patient is likely to receive fewer transfusions. Second, the surgical procedure could be directed at the specific lesion and site. Accurate preoperative diagnosis would reduce operating time and eliminate inappropriate surgical procedures. Accurate diagnosis also should eliminate the need for blind gastrectomy. Third, accurate preoperative diagnosis would eliminate surgical exploration to detect the bleeding source. Fourth, surgical risk could be predicted better, especially for treatments with an expected high morbidity, such as total gastrectomy for hemorrhagic gastritis. The lavage, which precedes endoscopy, may slow or stop bleeding. In addition, endoscopy can suggest long-term threapy, such as abstention from aspirin or alcohol.[12] For patients with continued active bleeding, early and specific diagnosis with UGI endoscopy remains vital for selecting appropriate therapy.[13]

The Mallory-Weiss lesion is a linear mucosal tear, usually found on the lesser curvature of the stomach, either at or below the gastroesophageal junction.[14] The risk of bleeding from esophageal varices is increased with larger size, location at the gastroesophageal junction, presence of red stigmata at endoscopy, advanced liver failure, band advanced ascites. Patients with Child–Pugh class A cirrhosis have a lower incidence of variceal bleeding, 5–7%, than those with Child–Pugh class C cirrhosis, who have a 70% risk.[15,16]

Vasoconstrictor therapy has been useful in controlling acute variceal bleeding. The American College of Gastroenterology recommends the empiric use of vasoactive therapy in the patient with a high likelihood of variceal bleeding before a definitive bleeding site is identified. Commonly used agents are octreotide and the combination of vasopressin and nitroglycerin. Octreotide, a longer acting analog of somatostatin, does not adversely affect cardiac function or blood pressure and can be used with safety in the patient with coexisting cardiac disease. Patients do not require special monitoring. The combination of safety and relative ease of use has made octreotide the initial choice for suspected or confirmed variceal bleeding. The infusion is generally continued for five days. Vasopressin reduces portal tributary inflow and, consequently, decreases portal pressure. In addition, vasopressin infusion may induce cardiac or splanchnic ischemia or cardiac bradydysrhythmias. Concomitant use of

nitroglycerin can mitigate some of these side effects and allow higher doses of vasopressin to be used.[16,17] Endoscopic therapy includes endoscopic sclerotherapy and endoscopic variceal ligation (EVL). These two procedures are now commonly available and allow the possibility of definitive therapy at the time of endoscopic diagnosis. Because of the complications associated with sclerotherapy, including esophageal perforation, esophageal stenosis, and ulcer bleeding, EVL has been used with a lower complication rate. Both sclerotherapy and EVL control acute bleeding in ~ 80% of patients. Recent data favor EVL over sclerotherapy in the long-term prevention of rebleeding .[18]

Sclerotherapy has been compared with surgical shunts in several studies. In controlled trials with follow-up of two to five years, sclerotherapy resulted in a decreased rebleeding rate or decreased transfusion requirements when compared with medical therapy. Despite improved control of bleeding, studies do not demonstrate a clear increase in survival.[19–23] When compared with portacaval shunt, sclerotherapy has a significantly higher rebleeding rate. Despite better control of bleeding, portacaval shunt does not improve either encephalopathy or mortality.[24] Three controlled trials have compared sclerotherapy with distal splenorenal shunt (DSRS). In all three trials, DSRS significantly decreased the rebleeding rate but did not change survival.[25–30]

The most important contribution of this clinical study were something like that a very new but effective score (Acute Abdominal Bleeding Score=AABS) for the diagnosis as well as realizing the clinical status of patients had been proposed which could be a very excellent tool for measuring the severity of the acute abdominal hemorrhagic patients on admission to evaluate them.[31]

Acute Abdominal Bleeding Score (AABS) in suspected patients (31)

Non specific etiology (Total Score 10)

	Highest score	Lowest score
Smoking	1	0
Alcohol	1	0
Aspirin and other anti-platelet and relevant drugs	1	0
Family history of AAB	1	0
Family history of specific abdominal pathology and/or neoplasm	1	0
Age over 50-70 or <70	1 or 2	0
Previous episodes of AAB for single or more than 1time	1 or 3	0
	10	0

Clinical presentation (Total Score 4)

Signs and symptoms	Highest score	Lowest score
Specific	4	0
Vague	1	0

Specific primary pathology (Total Score 4)

Present	4
Absent	0

Other consideration by the judgment of the physicians (Total Score 2)

Highest score	2
Lowest score	0

Interpretation

	Highly significant	Significant	Consider significant	suspi-cious
Non specific etiology	≥6	≥4	≥3	≥3
Clinical presentation	4	4	4	1
Specific presentation	4	4	4	1
Physician consideration	2	1	0	0
Total	≥16	≥13	≥11	≥5

So, the approximately range of interpretation for diagnosis and evaluation of AAB patients:
Total highest score= 20
Highly significant ≥16
Significant 13 to 15
Consider significant 11 to 12
Suspicious 6 to 10
Not significant ≤5

Methods

This is descriptive type of epidemiological cross-sectional study. It was done in the general surgery indoor department of Khulna Medical College Hospital, Bangladesh during the period from 12 June 2006 to 13 June 2010. Study population includes patients, admitting in the general surgery indoor department of Khulna Medical College Hospital, Bangladesh with sample size of 52. The sample size was selected by using the formula $Z^2pq \times d^{2.}$ Convenient type of purposive sampling technique was applied. Data was analyzed after collection according to the objectives and purposes of the study.

Results

This study was conducted on a total number of 52 (who were suspected as patients of acute abdominal bleeding preoperatively) patients admitted in general surgery wards (No11+12, Unit 2) of Khulna Medical College Hospital, Bangladesh during the period of the study. Table 1 and Figure 1 show the age and sex distribution of the study population.

Table I: Age and sex distribution of the study population

Age in years	Male	%	Female	%
0 – 14	0	00	0	00
15 – 29	2	4.9	0	00
30 – 44	23	56.1	4	36.4
45 – 59	16	39	7	63.6
Total	41	78.8	11	21.2

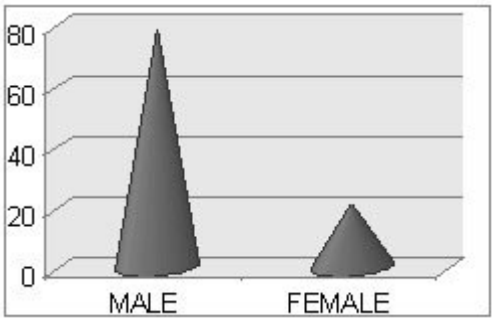

Figure 1. Sex distribution of the patients.

Table II: Distribution of sample population for statistical testing

	Diagnosis	Diagnosis
Positive	True positive (TP) 32	False positive (FP) 05
Negative	False negative (FN) 11	True negative (TN) 04

Table III: AABS in terms to sensitivity, specificity and other statistical tests

Test	AAB score
Sensitivity	74%
Specificity	44%
Predictive value of a positive test	86%
Predictive value of a negative test	27%
Percentage of false negatives	26%
Percentage of false positives	6%

In this clinical study, the newly proposed AAB scoring system was tried to be justified clinically among the 52 patients of suspected acute abdominal bleeding on the basis of sensitivity, specificity, predictive value of a positive test, predictive value of a negative test, percentage of false negatives and percentage of false positives where those were found to be 74%, 44%, 86%, 27%, 26% and 56% respectively (Table III).

Discussion

A study was conducted in Chittagong Medical College Hospital, Bangladesh from 10.12.08 to 03.05 09 with gastrointestinal haemorrhage where this AABS was proposed as a new scoring system for the early diagnosis and evaluation of emergency patients (published in Bratislava Medical Journal in the volume 111, issue 4, 2010)[31].

This current study was conducted with a view to evaluate this new score in terms of different statistical tests. In this clinical study, the newly proposed AAB scoring system was found to have sensitivity, specificity, predictive value of a positive test, predictive value of a negative test, percentage of false negatives and percentage of false positives 74%, 44%, 86%, 27%, 26% and 56% respectively. The results of statistical testing of this scoring system are certainly good enough for its clinical implementation in emergency patient of haemorrhage for a quick diagnosis and evaluation.

We believe that this is nothing but an assumption and time is the vital deadline here and it will take more years of debate and research before an original fruitful final conclusion is reached, of course. It is very clear that though the study was held on a very small sample of population in the general surgery indoor department of Khulna Medical College Hospital, Bangladesh, it may be unable to depict the more realistic picture in this connection about the new scoring system as a whole, that is – in fact the actual situation may be much different than it is depicted here.

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