Outcomes of Emergency Surgical Management of Upper Gastrointestinal Bleedings and its Correlates in Two Referral Hospitals at Tabriz

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Abstract: Surgical management of certain cases with Upper Gastrointestinal Bleedings (UGIB) is inevitable. Several studies suggested that the mortality and morbidity of these procedures in emergency settings is unfavorably high. This study was conducted to evaluate the outcome of patients who underwent emergency surgery for UGIB in capital city of a northeastern province of Iran. A retrospective cross sectional design was settled to explore the medical information of general surgery wards and intensive care unit of two tertiary teaching university hospitals. Out of 1001 patients admitted with the diagnosis of UGIB, the data on the risk factors and outcomes of the operation of the 102 patients who were operated on to control UGIB from March 2002 to December 2005 were collected. Out of 102 (15 females and 87 males) patients who underwent surgery, 27 subjects did not survive. Peptic ulcer was the most common etiology of bleeding and hematemesis was the most common presenting manifestation of the condition. Age over 60, shock during hospitalization, coexisting disease, in-hospital bleeding and transfusion requirement more than 6 units of packed cells were accompanied by increased operative mortality. Arrangement of suture ligation, vagotomy and pyloroplasty had the least rates of relapsing bleeding (12.6%) and mortality (24.1%). Antrectomy and vagotomy had the highest mortality (45.5%) and subtotal gastrectomy had highest relapsing bleeding (20%). Mortality rate of operation conducted by non-attending surgeons was insignificantly higher than that of operations conducted by attending surgeons (29.3% Vs. 18.5%; p>0.05). Operative mortality in 44.1% of patients was potentially avoidable. High operative mortality rate found in this study was associated with older age, presence of co existing disease, in-hospital re-bleeding and shock and outsized transfusion requirement. Supervision of attending surgeons may reduce the mortality rate of emergency surgeries of UGIB.

Key words: Upper gastrointestinal bleedings, emergency surgery, mortality, re-bleeding, co-morbidity, complications

INTRODUCTION

Intractable upper gastrointestinal bleeding (UGIB) or relapsing bleeding should be treated surgically (Starlinger and Becker, 1991; Rivkin and Lyakhovetskiy, 2005; Terdiman, 1998) however, emergency operations result in significantly high mortality rates. Despite considerable improvement in the diagnostic and therapeutic endoscopic approaches some studies suggest unsatisfactorily high mortality rates. There are large number of studies that describe the mortality and morbidity of UGIB and factors that influence them however few studies have evaluated the outcome of surgical management of UGIB, (Vreeburg et al., 1997;

Arora et al., 2002). The aim of this study was to determine the outcome of emergency operations for UGIB and its correlates in two teaching university hospitals in Eastern Azerbaijan, a northwestern province of Iran.

MATERIALS AND METHODS

In this cross sectional retrospective study, the medical records of patients with the final diagnosis of acute UGIB who were admitted in ICU and general surgery departments of Imam and Sina hospitals (Tabriz, Iran), two tertiary teaching university hospitals, from May 2002 through December 2005, were explored. Out of all 1001 patients with diagnosis of acute UGIB, 102 patients were

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operated at some stage in their hospitalization with the intention to control the bleeding. Data concerning health characteristics, including presenting complaints and past medical history, medications, habits and history of concurrent diseases were recorded. All data in relation to the etiology and outcome of the hemorrhage of patients were collected. In all operated patients, UGIB was defined as bleeding from those parts of the gastrointestinal tract proximal to the ligament of Treitz. The source and the etiology of bleedings were established based on the surgical or pathologic findings. Re-bleeding was defined as any episode of UGIB subsequent to the initial control of bleeding during the hospitalization. Certain complications, including leak of anastomosis, increase of azotemia and respiratory failure, were considered preventable by improved surgical techniques and appropriate resuscitation of patients.

The Chi-square test was used to determine the existence of associations between categorical variables and t-test and analysis of variance were employed appropriately to compare means of scale variables. A p-value of less than 0.05 was considered to be statistically significant.

RESULTS

Emergency surgical haemostasis was required in 102 patients with UGIB (15 females and 87 males). Twenty five (24.5%) patients were admitted from other medical centers; among them, 2 subjects had been operated previously and had experienced relapsing bleeding. Fourteen other (13.7%) patients were instantly admitted to the surgery units and the remaining 63 patients were initially admitted to the internal medicine service and then were transferred into the surgery units. Twenty five (24.5%) patients were hospitalized for other reasons and subsequently had experienced in-hospital UGIB. Hematemesis with or without malaena were the most common presenting symptom featuring in 84 (82.3%) patients.

Overall mortality rate was 26.4% (n = 27); comprising 25 cases out of 55 patients admitted to ICU (45.5%) and 2 subjects among 47 patients of the surgery units (4.3%). The mortality of women and men were 26.7 and 26.4% respectively, the difference was not statistically significant. The patients aged from 4-103 years. Twenty nine patients (28.6%) were over 60 years and 73 patients (71.5%) were under 60. Mortality rates were 23.3% (n = 17) and 34.5% (n = 10) for patients under and over 60 years respectively (p<0.05, OR = 1.73). The characteristics of those with fatal and non-fatal UGIB are shown in Table 1. The most common feature of those who did not survive was the presence of coexisting diseases (n = 17, 63%).

Table 1: Characteristics of survivor and non-survivors patients

	Fatal UGIB	NON-Fatal UGIB	p-value
Age (years)	50.78±17.21	44.97±20.6	p<0.005
duration of hospital stay (days)	10.93±6.63	2.36 ±8.55	p<0.005
shock at the admission	66.6%(18)	52%(39)	p>0.1 ,OR = 1.3
Shock During hospital stay	88.8% (n = 24)	38.6% (n = 29)	p<0.0005,OR = 12.7
Previous history of UGIB	14.8% (n = 4)	20% (n = 15)	p>0.5,OR = 0.7
Smoking	37% (n = 10)	33.2%(25)	p>0.05, OR = 1.2
Re-bleeding before operation	77.7%(21)	73.3% (n = 55)	p>0.5.OR = 1.3
Co-morbid disorder	63 %(n = 17)	21.3 %(n = 16)	p<0.0005

Table 2: Association of history of major medication in recent week with UGIB

Medication	Non survivals(n:27)	Survivals (n:75)	p- value
Aspirine	6 (%22.2)	14 (%18.7)	p>0.5
NSAID	4 (%14.8)	19 (%25.3)	p>0.1
Cortico Steroids	3 (%11.1)	1 (%1.3)	p>0.05
Anticoagulants	7 (%26)	2 (%26)	p<0.001

The mortality rate of those subjects admitted for causes other than UGIB and have experienced in-hospital UGIB was 56% (n = 14) compared to 16.8% (n = 13) of other patients (p<0.0005, OR = 6.3). The overall duration of hospital stay was 12.0±8.1 days.

The association of fatality of UGIB and the medications are shown in Table 2. Among all, the recent history of anticoagulants use was associated with increased operative mortality.

The mean transfusion rate in those with fatal and nonfatal UGIB for the primary resuscitation was 5.85 and 4.77 units of packed RBCs respectively (p<0.0005). The mean total transfusion in subjects with fatal and nonfatal UGIB was 15.65 and 9.31 units respectively (p<0.0005). During hospital stay, 29 patients received = 6 units of packed cells; 36 received 7-10 units; and 36 other patients received >10 units. Of these patients one (3.44%), 7 (19.4%) and 19 (52.7%) passed away, correspondingly.

The frequency of employment of different surgical techniques is shown in Table 3. The most commonly used surgical technique were vagotomy, pyloroplasty and ulcer suture ligature. The highest rate of recurrence (20%) occurred after subtotal gastrectomy without vagotomy and the least rate of recurrence (12.7%) was observed after vagotomy and pyloroplasty and ulcer suture ligature (p<0.005). In general, the mortality rate of ulcer suture ligature, vagotomy and pyloroplasty was 24%. Twenty-seven patients were operated by the attending surgeons of the department of surgery; of these patients 5 patients passed away (18.5%). Out of 75 patients who were not operated directly by the attending surgeons, 22 patients passed away (29.3%). The difference between the mortality rate of operations conducted directly by

Table 3: Different surgical approaches; Relapsing bleeding rate and comparison between fatal and non-fatal UGIB

Procedure	Fatal UGIB N = 27	NON-Fatal UGIB N = 75	Total N = 102	Relapsing bleeding N = 14
Antrectomy and Vagotomy	5 (45.5%)	6 (54.5%)	11 (10.8%)	2 (18.2%)
Subtotal Gastrectomy without Vagotomy	1 (20%)	4 (80%)	5 (4.9%)	1 (20%)
Suture ligation, vagotomy, and pyloroplasty	19 (24.1%)	60 (82.6%)	79 (77.5%)	10 (12.6%)
Others	2 (%28.6)	5 (%71.4)	7 (6.8)	1 (14.3)

Table 4: Postoperative medical or surgical complications

Complication	Fatal UGIB N = 27(%)	NON-Fatal UGIB N = 75(%)	Total N = 102 (%)
Respiratory failure	17 (63)	2 (2.7)	19 (18.6)
Postoperative Increase of Azotemia	16 (59.3)	-	16 (15.7)
Re-bleeding	11 (40.7)	3 (4)	14 (13.7)
Leak of Anastomosis	11 (40.7)	4 (5.3)	15 (14.7)
Myocardial Infarction	1 (3.7)	2 (2.7)	3 (2.9)
Sepsis	3 (11.1)	-	3 (2.9)
Hepatic failure	3 (11.1)	-	3 (2.9)
Others	4 (14.8)	1 (1.3)	5 (4.9)

Data are shown as number and percentages (in parentheses); Overall 39 patients experienced complications. As it was the case that more than one complication was detected in the same patient, the sum of complication adds up more than 39

attending surgeons and that of surgeries performed by non-attending surgeons was not statistically significant (p>0.05).

Operations of 13 patients were intricate with intra-operative complications including 3 cases of cardiovascular collapse and electrolyte imbalances, an intestinal burn with cautery, a splenectomy, 6 tracheostomies due to iatrogenic conditions and 2 massive bleedings. None of the etiologies including gastric ulcer, duodenal ulcer and erosive gastritis had significant association with consequent mortality.

Thirty nine (38.3%) patients experienced postoperative medical or surgical complications (Table 4). In general, medical and surgical complications before and/or after surgery accompanied 63% of patients. Fourteen (13.7%) patients had postoperative re-bleeding. The mortality of subjects with re-bleeding was 78.9% (n = 11). Leak of anastomosis and abscess formation was detected in 15 subjects. Among 39 complicated patients, 12 (30.7%) were over 60 and 10 (83.3%) of them did not survive. The mortality of the remaining 27 patients who were under 60 was 62.9% (n = 17). Fourteen (13.7%) patients were re-operated; 12 patients had just one reoperation and 2 other patients were re-operated three times. The mortality of subjects underwent reoperation was 57% (n = 8). One or a combination of preventable complications were presented in 44.1% of patients who did not survived.

DISCUSSION

The results indicates that, in our setting during 3 consecutive years (2002-2005), out of 1001 patients admitted for UGIB 10.2% required emergency surgical hemostasis and overall mortality rate was 26.5%. This is comparable with other studies representing surgical intervention rates of 3-9% (Kasem *et al.*, 2006; Thomopoulos *et al.*, 1998) (4, 9, 51) and mortality rates between 10-30% (Legrand and Jacquet, 1996; Depolo *et al.*, 2001; Rockall, 1998). In our setting, the observed mortality rate is relatively high and compared to the studies from developing countries, our surgical intervention rate is more similar to that of last decade than recent reports (Thomopoulos *et al.*, 2004). In present study, the patients were younger and had relatively higher mortality rates; 71% of subjects aged less than 60 years out of whom 23% did not survive; these rates are higher than those of previous reports (Branicki *et al.*, 1990; Al-Akeely *et al.*, 2004; Choudari *et al.*, 1995). The mean duration of hospital stay was about 12 days which is comparable to that of previous reports (Vreeburg *et al.*, 1997; Ruiz *et al.*, 2001).

Hematemesis with or without malaena was the most common clinical manifestation and was presented in 82% of patients. This is comparable with the findings of other studies reporting the isolated malaena as the most common presenting symptom in about 70-81% of patients (Lakhwani *et al.*, 2000). This may represent that more severe forms of bleeding were referred or admitted into studied hospitals.

Consistent with other studies (Sandel *et al.*, 2000; Mueller *et al.*, 1994), coexisting disease showed to be the unyielding correlate of mortality in patients operated for UGIB. A considerable percentage of patients who didn't survive the operation had several concomitant risk factors including age over 60, shock during hospitalization, co-existing disease and need to transfusion of more than 10 units of blood. Therefore, scrutinizing the patients to find high-risk subjects is crucial to decrease the mortality. In consistence with other reports (Anand *et al.*, 1983), gender do not affect adversely our operation related mortality, however, males required relatively more surgical interventions. History of smoking didn't have statistically significant effect on mortality, in contrast to earlier studies (Lakhwani *et al.*, 2000). The mortality rate of subjects admitted for causes other than gastrointestinal bleeding complicating with UGIB during the course of their hospitalization (in-hospital UGIB cases) was as high as 56%. This is similar to the findings of other studies reporting mortality rates ranging between 26 and 44% among in-hospital UGIB (Vreeburg *et al.*, 1997). This

highlights the need for more aggressive prevention and treatment of hospitalized patients vulnerable to UGIB. History of previous bleeding showed no significant association with the operation related mortality (Kankaria and Fleischer, 1995).

We found that shock at admission do not adversely impact operation related mortality, in contrast with the previous studies (Branicki *et al.*, 1990; Al-Akeely *et al.*, 2004; Hasselgren *et al.*, 1998). Conversely, shock during hospital stay, which associated with relapsing bleeding after initial control of bleeding, increased mortality rate. These findings underscore the importance of implication of strategies to reduce delayed operation and incomplete preoperative resuscitation. About 75% of patients experienced pre-operation re-bleeding, out of whom 28% did not survive, rebleeding before surgery had no statistically significant effect on operative mortality. About 14% of patients had relapsing bleeding after surgery and 79% of them did not survived. Relapsing bleeding after surgery was accompanied by increased mortality. It was previously reported that about 6% of UGIB patients had relapsing bleeding after surgery and the mortality after re-bleeding rise to 36% which is considerably lower than that in our patients (Depolo *et al.*, 2001).

Transfusion rate in subjects with fatal and nonfatalUGIB was respectively 15.7 and 9.3 units of packed cells. Probably, secondary to the severity of underlying cause of bleeding or delayed operation, non-survivors had higher amount of bleeding and required a high number of transfusions. Likewise the mean number of transfusions for initial resuscitation of patients with fatal UGIB was higher than the survivor patients (5.85 units versus 4.77 units), indicating the severity of bleeding or longer duration of bleeding before admission. The mortality rate of patients who received 6 or less than 6 units of blood was 4%, in those received between 7-10 units was 16% and in those received more than 10 units of blood mortality was 26%. Earlier operation may lessen the bleeding and the need to transfusion and may reduce the mortality.

In our study the highest mortality occurred after antrectomy with vagotomy (45.5%). Ulcer suture ligature with vagotomy and pyloroplasty showed to be safe and the less invasive method. In our setting, the most employed methods to manage duodenal ulcer were truncal vagotomy with pyloroplasty and then vagotomy with antrectomy. Some surgeons prefer total or near total gastrectomy compared to more conservative methods specifically vagotomy with pyloroplasty, resection of ulcer and erosion, or partial gastrectomy with vagotomy for gastric ulcers (Wang *et al.*, 1998). The mortality of

operations performed by non-attending surgeons was 29.3%, as high as twice of those performed by attending surgeons. High experience of surgeons at emergency surgical interventions in UGIB settings may prevent technical errors and decrease the mortality.

CONCLUSION

In summary less invasive surgical techniques like ulcer suture ligature with vagotomy and pyloroplasty were the safest techniques for surgical management of UGIB in this study. Hospitalized patients with risk factors of UGIB should receive prophylactic medical treatment for UGIB. Strict monitoring and rapid treatment should be posted to prevent in-hospital shock which is an uncompromising correlate of mortality and morbidity of UGIB. Some complications like leak of anastomosis, renal or respiratory failure can be prevented by improved surgical and shock management techniques. Derived from the relatively low percentage of emergency operations in UGIB patients, the outsized transfusion requirement and high mortality rates, we should consider more prompt surgeries in patients with UGIB in our setting.

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