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Original Article

Characteristics of Bleeding Peptic Ulcers and the Outcome after Endoscopic Therapy at a Tertiary Care Centre of Pakistan

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ABSTRACT

Peptic ulcers are a global health concern. Bleeding episodes, a common complication require urgent intervention. Endoscopic therapy for managing bleeding peptic ulcers offering both diagnostic and therapeutic benefits. **Objective:** To analyze the characteristics of bleeding peptic ulcers and assess the outcomes following endoscopic therapy. **Methods:** A descriptive case series was conducted at Lahore General Hospital (LGH) between June 2021 and January 2022. Patients aged 18-80 with upper GI bleeding due to peptic ulcers or undergoing endoscopy with bleeding peptic ulcers were included. An 80mg bolus of omeprazole was given, followed by infusion at 8mg per hour and an urgent endoscopy was planned. Patients were observed for re-bleeding for 72 hours post-endoscopy. **Results:** Out of total 100 patients with upper GI bleeding, 70% of patients were male and 30% were female. The most common diagnosis was duodenal ulcers (75%), with the anterior wall being the most common site (86.67%). Dual therapy was administered in all patients, with hemostatic clips being applied in 68% of patients and electrocoagulation heat therapy being used in 32% of patients. Initial hemostasis was successful in 88% of patients treated endoscopically. But, 12% of patients experienced heavy bleeding during endotherapy and out of these, 8 patients required urgent laparotomy. Patients needed a second look endoscopy, 4 patients requiring angiographic embolization and 6 being managed with endotherapy. **Conclusions:** Dual therapy, hemostatic clips and electro-coagulation heat therapy are effective in achieving initial hemostasis in most cases.

INTRODUCTION

Approximately 19–57 incidences of bleeding peptic ulcers per 100,000 individuals are thought to occur each year [1]. It is one of the most frequent presentations in emergency rooms throughout the world with considerable morbidity and mortality [1]. Peptic ulcer bleeding accounts for approximately 50% of upper gastrointestinal bleeding cases [2]. The most prevalent causes of peptic ulcers are *Helicobacter pylori* infection and drug use, specifically non-steroidal anti-inflammatory drugs (NSAIDs), antiplatelet medications like aspirin, and anticoagulants. The usage of drugs in combination increases the risk of bleeding from ulcers many fold according to some studies [3, 4]. However, the occurrence of non-*H. pylori* and non-NSAID peptic ulcer disease has decreased recently due to effective management in the diagnosis and treatment of *H. pylori* infection and judicious use of NSAIDs especially in the developed countries [4]. A majority (around 80-85%) of bleeding peptic ulcers stop spontaneously and endoscopy is not needed. However recurrent bleeding has significant mortality that is why antisecretory agents and endoscopic treatment is recommended [2]. Upper GI endoscopy should be performed within 24 hours, ideally within 12 hours in addition to intravenous PPI. The management depends on endoscopic appearance of ulcers, for actively bleeding ulcers dual therapy with epinephrine and bipolar electrocoagulation or hemostatic clips [5]. Rebleeding

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occurs in around 10-30% of patients after successful endoscopic therapy [6]. Several factors are thought to contribute to mortality after therapeutic endoscopy such as advanced age, presence of comorbidities, hemodynamic instability at presentation, continued bleeding and failure of endoscopic therapy resulting in surgical intervention [7].

This study aimed to present an overview of our experience managing bleeding from peptic ulcers, with a focus on the attributes and consequences of gastro duodenal ulcer bleeding related to age, gender, comorbidities, and drug use.

METHODS

A descriptive case series was studied at the Department of Gastroenterology at Postgraduate Medical Institute, Lahore General Hospital Lahore between June 2021 and January 2022 (IRB Reference number 20-22-21, dated 23/09/21). An informed consent was requested from all the patients prior to the data acquisition. Total 100 patients meeting the inclusion criteria were enrolled using convenient sampling method. Sample size was calculated using $n = (z)^2 p (1 - p) / d^2$,Z=1.96 ,p= probable proportion of the population that presents the characteristic [19]. All patients between aged 18 and 80 years, irrespective of both genders, presenting with Upper GI bleeding due to bleeding peptic ulcers, those undergoing endoscopy due to any other indication or bleeding peptic ulcers, and who have had therapy for bleeding peptic ulcers in the past and those admitted in hospital for any other reason and bleeding during hospital stay were included in the study. Patients with clean based ulcers, without any stigmata for recent bleeding, had malignant ulcers, those who were unfit to undergo endoscopy, or were allergic to any drugs used in the study, Pregnant or breast feeding patients were excluded from the study. All patients' demographics were noted. In the patients that presented with upper GI bleeding, Omeprazole was infused continuously at a rate of 8 mg every hour after an 80 mg intravenous bolus and an urgent endoscopy was planned. During endoscopy the ulcer characteristics were noted and a suitable dual therapy was given depending upon the size, location and class of ulcer. Patient was observed for 72 hours post endoscopy for any signs of rebleeding like hematemesis, melena, fall in hemoglobin and hemodynamic instability. A second look endoscopy was performed only if rebleeding was present. Again the characteristics of ulcer was noted and therapy was given. Patients who failed therapy were referred for surgery or radiological intervention.

RESULTS

Out of 100 patients evaluated, 70 (70%) were men and 30 (30%) were women. 90 (90%) patients were admitted through emergency with complaints of upper GI bleeding and 10 (10%) patients were already admitted with other diseases. Out of these 75 (75 %) of patients had duodenal ulcers with the most common site being anterior 60 (86.67%) followed by posterior wall of duodenal cap. 18 (18%) patients had both gastric and duodenal ulcers, while 7(7%) had just both gastric and duodenal ulcers. Using Forrest classification 15 (15%) ulcers belonged to Forrest Ia, 18 (18%) to Ib, 50 (50%) to IIa and 17 (17%) to IIb. Dual therapy was administered in all the patients i.e. following adrenaline injection in all patients. In 68 (68%) patient's hemostatic clips were applied while with adrenaline and in 32 (32%) patients were given electrocoagulation heat therapy with gold probe was used with adrenaline. Out of the 100 patients treated endoscopically in 88 (88%) patients initial hemostasis was successful, 12 (12%) patients started bleeding heavily during endotherapy and 4 out of these 12 (33.3%) could be managed endoscopically and 8 (66.66%) needed urgent laparotomy out of which 5 (62.5%) survived post surgically, 3 (37.5%) patients died because of associated comorbids and septicaemia, 18 patients had rebleeding and 4 (22.22%) patients died before second look endoscopy because of associated comorbids and ischemic heart disease, 14 patients needed second look endoscopy for rebleeding and out of these 14 patients, four patients needed angiographic embolisation and 6 could be managed with endotherapy, four patients died because of cardiovascular events.

Table 1: Sociodemographic and Clinical Profile of Study Participants

Parameters	N (%)
Age (Years)	
18-40	14 (14%)
41-65	38 (38%)
>65	48 (48%)
Etiology of Ulcer	
H.pylori Disease	27 (27%)
NSAIDs Use	18 (18 %)
Low Dose Aspirin	5 (5%)
NSAID + Low Dose Aspirin	13 (13%)
H.pylori disease + NSAIDs	24 (24%)
H.pylori Disease + NSAIDs + Low Dose Aspirin	8 (8%)
Others	5 (5%)
Ulcer Site	
Duodenal	28 (28%)
Gastric	6 (6%)
Gastroduodenal	3 (3%)
Comorbid Illness	
Cardiovascular Disease	6 (6%)
Cerebrovascular Disease	1 (1%)
Pulmonary Disease	2 (2%)
Rheumatological Disease	3 (3%)

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Kidney Failure	6 (6%)
Liver Failure	7 (7%)
Cancer	7 (7%)
Diabetes Mellitus	13 (13%)
Smoking	7 (7%)
NKCM	48 (48%)

In table 2, out of these 75 (75 %) of patients had duodenal ulcers with the most common site being anterior 60 (86.67%) followed by posterior wall of duodenal cap. 18 (18%) patients had both gastric and duodenal ulcers, while 7(7%) had just both gastric and duodenal ulcers. Using Forrest classification 15 (15%) ulcers belonged to Forrest Ia, 18 (18%) to Ib, 50 (50%) to IIa and 17 (17%) to Iib.

Table 2: Etiology of Peptic Ulcer with Respect to Gender

Etiology	Males N (%)	Females N (%)
H.pylori Disease	20 (28.57%)	7 (23.33%)
NSAIDs Use	13 (18.57%)	5 (16.67%)
Low Dose Aspirin	4 (5.71%)	1 (3.33%)
NSAID + Low Dose Aspirin	8 (11.43%)	5 (16.67%)
H.pylori Disease + NSAIDs	16 (22.86%)	8 (26.67%)
H.pylori Disease + NSAIDs + Low Dose Aspirin	5 (7.14%)	3 (10.00%)
Others	4 (5.71%)	1 (3.33%)
Total	70 (70%)	30 (30%)

In Table 3, Out of the 100 patients treated endoscopically in 88 (88%) patients initial hemostasis was successful, 12 (12%) patients started bleeding heavily during endotherapy and 4 out of these 12 (33.3%) could be managed endoscopically and 8 (66.66%) needed urgent laparotomy out of which 5 (62.5%) survived post surgically, 3 (37.5%) patients died because of associated comorbids and septicaemia, 18 patients had rebleeding and 4 (22.22%) patients died before second look endoscopy because of associated comorbid and ischemic heart disease, 14 patients needed second look endoscopy for rebleeding and out of these 14 patients, four patients needed angiographic embolisation and 6 could be managed with endotherapy, four patients died because of cardiovascular events.

Table 3: Distribution of Sociodemographic and Clinical Parameters with Respect to Rebleeding and Death

Variables	Rebleeding (n=18) N (%)	Death (n=11) N (%)
Age > 65	14 (77.78%)	9 (81.82%)
Gender		
Male	14 (77.78%)	8 (72.73%)
Female	4 (22.22%)	3 (27.27%)
Ulcer Site	-	-
Duodenal	13 (72.22%)	9 (81.82%)
Gastric	3 (16.67%)	1 (9.09%)
Gastroduodenal	2 (11.11%)	1 (9.09%)
Forrest Class		
Ia	7 (38.89%)	5 (45.45%)
Ib	5 (27.78%)	3 (27.27%)
IIa	5 (27.78%)	3 (27.27%)
IIb	1 (5.56%)	0 (0.00%)
Drugs		
NSAIDs	5 (27.78%)	-
Dual Antiplatelets	5 (27.78%)	-
Oral Anticoagulants	3 (16.67%)	-
Comorbid Illness		
Cardiovascular Disease	4 (22.22%)	2 (18.18%)
Cerebrovascular Disease	1 (5.56%)	0 (0.00%)
Pulmonary Disease	1 (5.56%)	0 (0.00%)
Rheumatological Disease	2 (11.11%)	1 (9.09%)
Kidney Failure	4 (22.22%)	1 (9.09%)
Liver Failure	4 (22.22%)	2 (18.18%)
Cancer	4 (22.22%)	3 (27.27%)
Diabetes Mellitus	8 (44.44%)	3 (27.27%)
Smoking	5 (27.78%)	5 (45.45%)

DISCUSSION

This study showed that *H. Pylori* infection is the major cause of peptic ulcers in our population followed by NSAIDS use, especially in elderly population. These results are like other local and international studies [8, 9]. However, in many developed countries NSAIDs use is becoming a more common cause of bleeding ulcers due to increasing use and decrease in *H. Pylori* prevalence [8]. Low dose aspirin is another because that results in bleeding ulcers and its risk of bleeding increases if it's used in combination with NSAIDs. As the number of people who are using low dose aspirin for primary or secondary prevention of cardiovascular or cerebrovascular events, so does the risk of peptic ulcer bleeding. Most patients with bleeding ulcers had multiple risk factors like Dual antiplatelet therapy, smoking. The most common site for peptic ulcer is duodenal bulb. Adrenaline therapy alone is less effective than other monotherapy like thermal or mechanical therapies with hemostatic clips, also adding a second therapy after adrenaline is significantly more effective than either of the therapies alone [10, 11]. We used dual therapy in all our patients depending upon the ulcer characteristics and location. In most of the patients the initial hemostasis was successful. Rebleeding was seen in 18% of our patients. The rebleeding rates seen in different studies vary from 8-25% [10, 11]. Risk for rebleeding are multiple, including large sized ulcers (>2cm), depth, active bleeding during endoscopy, site of ulcer i.e. ulcer on posterior duodenal wall or gastric curve, severe coagulopathies, coexisting medical conditions, shock or hypotension during presentation [10, 12]. In our study the risk factors for rebleeding included patients with rebleeding had underlying diseases like rheumatologic

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diseases, renal or liver diseases or had multiorgan failures. The patients requiring surgery had high mortality in both patient groups, i.e. the ones with failed primary hemostasis and those whole failed therapies after rebleeding. Peptic ulcer bleeding is more common in elderly. 8% to 15% of patients did not receive effective endoscopic hemostasis [1]. A patient's ulcer's size, depth, location, and the point at which the bleeding began when they were an inpatient all affect how often they bleed again. According to reports, the majority of rebleeding events take place during the first seven days [10]. Angiographic embolization should be administered to patients who did not achieve hemostasis with endoscopic measures. Angiographic embolization has fewer problems than surgery, although the rate of rebleeding is greater. Wong *et al.,* enrolled a total of 101 patients who had bleeding peptic ulcers that could not be stopped using endoscopic hemostasis [13]. 50 patients underwent angiographic embolization, and the other 51 patients underwent surgery to remove the ulcer. According to the study, angiographic embolization had a better success rate (96% vs. 86%) for successfully controlling bleeding than surgery. The patients who underwent angiographic embolization also had a shorter hospital stay and a lower incidence of complications compared to those who underwent surgery [13]. The study suggests that angiographic embolization may be a more effective and less invasive treatment option for patients with bleeding peptic ulcers after failed endoscopic hemostasis compared to surgery. But it is imperative to acknowledge that the study was subject to certain limitations, including a small sample size and a lack of randomization, which could potentially impact the findings' generalizability [13]. Repeated endoscopic therapy is an effective way to treat bleeding that recurs after an initial endoscopic hemostasis procedure. Similar hemostasis is achieved with considerably fewer postoperative complications with repeated endoscopic therapy than with surgery [10]. In the past, surgery has been the first line of treatment when an endoscopy fails. Surgery for bleeding ulcers is still necessary in two main situations. Firstly, Persistent Bleeding refers to the continuation of bleeding despite attempts at endoscopic treatment. Secondly, recurrent bleeding entails the reappearance of bleeding even after an initially successful endoscopic treatment, possibly necessitating surgical intervention for effective management. Thus, surgery remains an option for bleeding ulcers when endoscopic methods don't work initially or when bleeding recurs after successful treatment. Essentially, because of an unsuccessful endoscopic procedure, 2.3% to 10% of patients need surgery [12]. A recent study found that factors such as patient age, concomitant diseases, hemodynamic instability upon admission, intra-hospital bleeding, recurrent bleeding, and surgical necessity all had an impact on mortality in patients following therapeutic endoscopy [5]. Rebleeding and mortality are two adverse PUB outcomes that have been discovered to have a strong correlation with age. The article by Chung *et al.,* provides an overview of the current understanding of Idiopathic Peptic Ulcers (IPUs) and suggests a systematic approach for their diagnosis and treatment [14]. The authors emphasize the importance of distinguishing IPUs from ulcers caused by other factors, as the management of IPUs may differ from that of other peptic ulcers. They suggest that a systematic approach should be taken to diagnose IPUs. This includes multiple diagnostic procedures such as upper endoscopy, biopsy, and serum gastrin levels in addition to a thorough history and physical examination [14]. Lau *et al.,* identified several risk factors associated with complicated PUD, including advanced age, male gender, use of non-steroidal anti-inflammatory drugs /NSAIDs, smoking, *H. Pylori* infection, and comorbidities such as liver disease, renal failure, and malignancy. Furthermore, mortality rates associated with complicated PUD were high, ranging from 5.5% to 14.5%. The authors noted that Patients with comorbidities had significantly higher rates of mortality and those who experienced perforation or bleeding [15]. The study by Toka *et al.,* aimed to compare the efficacy and safety of the treatment of bleeding peptic ulcers: monopolar hemostatic forceps with gentle coagulation is preferable over hemoclip [16]. The study found that the frequency of bleeding again in 30 days was significantly lower in the monopolar hemostatic forceps group compared to the hemoclip group (5.3% versus 19.6%, respectively). The monopolar hemostatic forceps group also had a significantly higher technical success rate (98.2% versus 85.7%), a shorter time to hemostasis (2.2 minutes versus 3.6 minutes), and a shorter length of hospital stay (4.4 days versus 5.3 days) compared to the hemoclip group. There were no discernible variations in the adverse outcomes between the two groups. Similar findings were revealed by other authors in literature [16-18]. Overall, the current study suggests that *H. Pylori* infection is the major cause of peptic ulcers in our population followed by NSAIDS use, especially in elderly population. These findings are compatible with the previous study [20]. The bleeding rate after surgery was 18%. Further research is required to corroborate these findings and determine the optimal treatment plan for this condition.

CONCLUSIONS

In summary, this study provides important understandings into the management of upper gastrointestinal bleeding in a cohort of 100 patients. The findings suggest that dual therapy, hemostatic clips, and electrocoagulation heat therapy are effective in achieving initial hemostasis in most

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cases. Though, insignificant proportion of patients experience heavy bleeding during endotherapy and require urgent laparotomy. Rebleeding remains a significant complication, and cardiovascular events can also contribute to mortality. Still more research is needed to recognize such strategies to reduce the likelihood of these adversative effects in patients experiencing upper gastrointestinal hemorrhage.

Authors Contribution

Conceptualization: FJ
Methodology: FJ, GUH, HURK
Formal Analysis: AD
Writing, review and editing: SR, AD, BN

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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