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Research Paper

Factors Affecting Morbidity and Mortality Rates in the Management of Perforated Gastroduodenal Ulcer in Al-Yarmouk Teaching Hospital

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ABSTRACT:

BACKGROUND:

Peptic ulcer disease is still a common problem in the developing countries and peptic ulcer perforation is still a common surgical emergency worldwide especially in developing countries.

OBJECTIVE:

Aim of this study is to assess the factors affecting morbidity and mortality in patients with peptic ulcer disease.

Study design

Materials and methods this prospective study recruited 56 patients with perforated ulcer who were managed in the emergency department in Al-Yarmuk Teaching Hospital in the period from November 2020 till December 2021.

RESULTS:

The mean age of patients was 39.4±15.8 years. Fifteen patients had co-morbidities. Overall morbidity and mortality rates were 14.3% and 8.9% respectively. Morbidity and Mortality rate was associated with advanced age, therapeutic delay and co-morbidities. Increased age and the delay in seeking medical treatment, life style habits, quality and quantity of intraperitoneal fluid and size of the ulcer.

CONCLUSION:

Early diagnosis and management are important to reduce morbidity and mortality rates; an attention is still needed to be paid to elderly patients who also complain of other comorbidities.

KEY WORDS: PUP; peptic ulcer; perforated ulcer; DU; PU

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INTRODUCTION:

Common sites for peptic ulcers are the first part of the duodenum and the lesser curve of the stomach. Although globally, the incidence of PUD is declining, However, in developing countries and despite the introduction of new drugs yet PUD remains a substantial healthcare challenge [1,2]. Duodenal ulcer tends to peak now in a much older age group than previously and, although it is still more common in men, the difference is less marked nowadays. These changes mirror the variations, at least in part, in the epidemiology of H.pylori infection, and the changes in term of westernization and new life and dietary style[3]. Evidence of the presence of H.pylori infection and NSAIDs usage are the most incriminated etiological factors. The sex incidence is equal and the population with gastric ulcers tends to be older. Ninety percent of duodenal ulcer occurs in the first part of duodenum duodenal bulb/cap: that is the part closest to the stomach and usually 5 cm [3] In regard for the blood supply of the stomach, the left gastric artery, a branch of coeliac artery (Smallest branch of coeliac axis) and the right gastric artery, a branch of hepatic artery, in addition to the gastroduodenal artery, which is the largest branch of hepatic artery, in association with the right gastroepiploic artery, that is a branch of gastro duo denal artery and the left gastroepiploic artery, a branch of splenic artery. Duodenal ulcer most occurs in the first part of the duodenum. A chronic ulcer penetrates the mucosa and into the muscle coat, leading to fibrosis. The situation in which there is both a posterior and an anterior duodenal ulcer is referred to as kissing ulcers. With specialized flagella and a rich supply of urease, H.pylori is uniquely equipped for survival in the hostile environment of the stomach. The prevalence of H.pylori in the low socioeconomic classes and associated poverty, overcrowding, and poor hygiene have increased the incidence of

duodenal and gastric perforations in all age groups particularly in the developing world.[4,5] another causative agent is the use of nonsteroidal Anti-Inflammatory Drugs. One of the most common symptoms in PUD is pain, an epigastric that is often described as gnawing and may radiate to the back. One of the classical features of untreated peptic ulceration is periodicity. This periodicity may be related to the spontaneous healing of the ulcer. Patients with gastric ulceration are often underweight but this may precede the occurrence of the ulcer. The bleeding may be chronic and presentation with microcytic anemia is not uncommon. Perforation is one of the commonest complications and needing emergency hospitalization [6,7]. Aim The aim of this prospective clinical study was to evaluate factors that affect morbidity and mortality in patients with perforated peptic ulcer.

METHODS:

This is a prospective study that included 56 patients all of them were diagnosed with perforated peptic ulcer in our emergency surgery department between 1st of November 2020 till the end of December 2021 were evaluated at Al Yarmouk teaching hospital.

Those who were diagnosed with Corona virus infection were excluded from the study. The data collected included patients' demographics table (1) co-morbidities, social habits figure (3.1)

Table 1: The demographic features of the studied sample (n=56).

Variables		Frequency	Percent
Age in years	<40 years	31	55.4
	≥40 years	25	44.6
Gender	Male	44	78.6
	Female	12	21.4
Occupation	Unemployed	13	23.2
	Free lancer	18	32.1
	Governmental employee	12	21.4
	Retired	13	23.2
BMI	BMI <30	26	46.4
	BMI ≥ 30	30	53.6
Past medical history	No	41	73.2
	Yes	15	26.8
Hx of peptic ulcer	No	43	76.8
	Yes	13	23.2
Total		56	100%

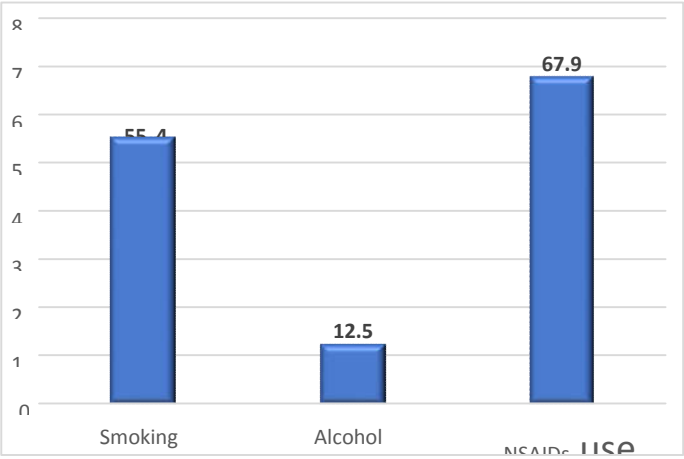

Figure 1: The distribution of patients according to social habits use

current presenting symptoms figure(3.2) vital signs, laboratory studies, and diagnostic procedures were documented table (3.2) and (3.3)

Table 2: Investigation results for the studied sample. (n=56).

Investigation	No complications	Mortality and Morbidity	P value
	Mean ± SD	Mean ± SD	
WBC	17930.2±4300.5	18846.1±5257.4	0.074
PCV	39.0±3.9	40.3±3.9	0.570
Bl. Urea	31.1±18.8	40.3±21.2	0.397
S. Creatinine	0.94±0.46	0.98±0.45	0.948

Table 3: Distribution of patients according to outcome by Xray. (n=56).

Variable		No complaint	Complications	P value
X ray	No	2 (100%)	0	0.586
	Yes	41(75.9%)	13(24.1%)	

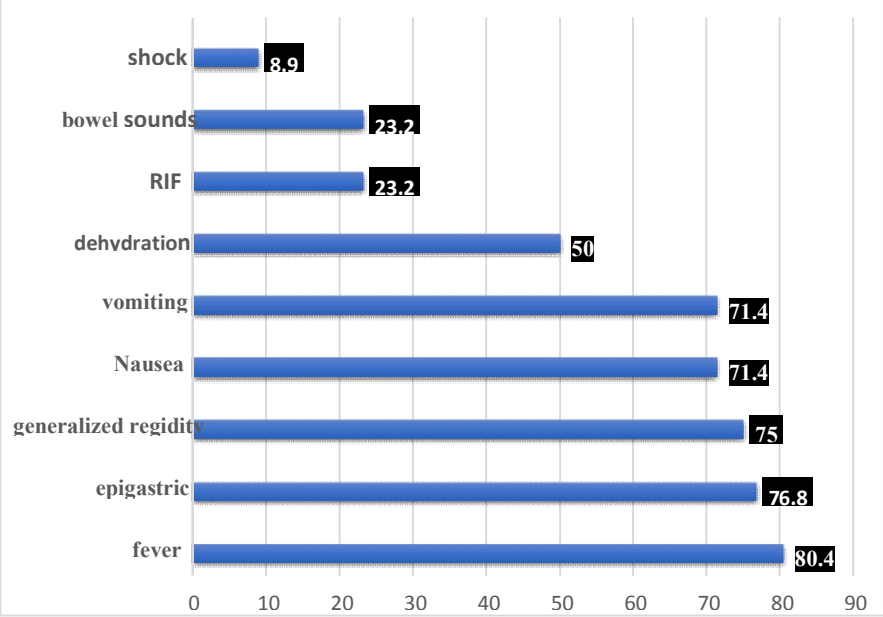

Figure 2: Symptoms and signs of the studied sample.

The duration of symptoms was defined as the time span between the initial pain perception due to perforation and hospitalization figure (3.3).

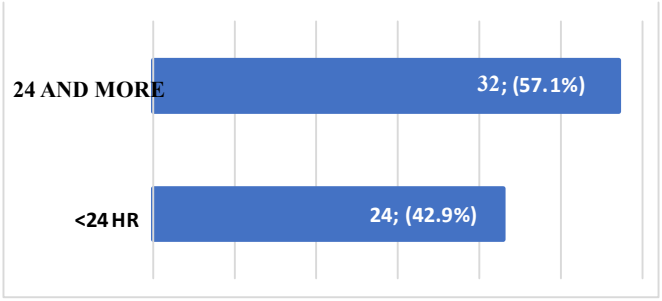

Figure 3 :Distribution of patient according to duration of symptoms before surgery

Details of treatment were also noted. Peptic ulcer perforation diagnosis was made on the basis of history, physical examination, routine laboratory studies and radiologic imaging. All perforated peptic ulcer operations during the stated time span were performed by open repair technique only. Briefly, three sutures through the ulcer edges were placed using 3/0 absorbable suture material. The needle was passed through the normal tissue a few millimeters away from the edge in order to avoid tearing the ulcer. Then, a patch of greater omentum was applied to the perforation site and the sutures were tied. Two drains were used one in the right subhepatic and one in the pelvic regions. The abdominal cavity was irrigated with warm saline. Peri-operative complication details were recorded during the follow up period which lasted for 30 days through repeated visits to the consultation clinic. The following clinical variables were evaluated for their influence on morbidity and mortality: age, gender, associated medical illness, Body mass index, duration of symptoms, previous peptic ulcer history (previous Oesophago-Gastro-Duodenoscopy), social habits , investigations: (WBC count, PCV, Blood urea and Serum Creatinine), the quantity and quality of intraperitoneal fluid, the amount of intraperitoneal lavage, site of the ulcer and its size table (3.4).

Table 4:The operative notes of the studied sample.

Operative notes		Frequency	Percentage
Quantity of intraperitoneal fluid	<500 ml	23	41.1
	500-1000ml	23	41.1
	>1 L	10	17.9
Type of intra peritoneal fluid	Purulent	17	30.4
	Bilious (food particles)	39	69.6
Site of Ulcer	Gastric	6	10.7
	Duodenal	50	89.3
Size of ulcer	<5mm	34	60.7
	>5 mm	22	39.3
Operative procedure	Graham Patch	55	98.2
	Modified Graham Patch	1	1.8
Peritoneal lavage (amount of saline used in ml)	≤1000	17	30.4
	>1000	39	69.6

Approval from the Scientific Council of General Surgery of the Iraqi Board for Medical Specializations was obtained and permission to collect the data was also granted from AlKarkh Health Directorate and Al Yarmook Teaching Hospital. Patients were interviewed and their records were checked by the researcher, intraoperative notes were all recorded and patients were followed for outcome. All data were coded and summarized using Microsoft excel and analyzed by using Statistical Package for Social Sciences. Categorical variables were presented as frequency and percentage while continuous variables were presented in means and standard deviations. T student test was used for continuous variables to check the significance difference between the mean of the two outcome groups (no complications and developing complications). Chi square test and Fisher exact test was used to test the significance of the association between dependent variables with the independent outcome variables.

RESULTS:

The mean age of patients was 39.4±15.8 years. Fifteen patients had co-morbidities. Overall morbidity and mortality rates were 14.3% and 8.9% respectively. Morbidity and Mortality rate was associated with advanced age, therapeutic delay and co-morbidities. Increased age and the delay in seeking medical treatment, life style habits, quality and quantity of intraperitoneal fluid and size of the ulcer.

DISCUSSION:

Peptic ulcer disease significantly impairs well-being and aspects of health-related quality of life, and is associated with high costs for employers and health care systems(.3) yearswhich is comparable to results reported by Ugochukwu AI.et al from south east Nigeria and Nuhu A et al from west Africa [8, 9].which can be indicative of the involvement of this age group with peptic ulcer disease. While our results were higher than that reported in by Seyoum N etal and Bupicha JA et al from Ethiopia [10,11] and lower than out come described in a study from Duhok-Iraq by Bahaddin M and Ahmed F [12], also lower than what Dodiyi-Manuel A et al published in west Nigeria [13], and several other articles that were peer reviewed and published by different authors from India [14], Turkey [15] and in Mexico [16]. These differences might be related to stress and psychological factors, whether on a personal or country stability from the political and economical point of view. Both are frequently identified as important contributors to peptic ulcer disease, since the mid-20th century, even stress has been well-thought-out as the main causative agent of peptic ulcer and complications. Recently, studies suggested the possibility of psychological stresses as anxiety, panic disorders and post traumatic syndromes among the causative factors for peptic ulcer [17,18].4.1.2. Male predominant Our current study clearly illustrated the male predominance in the peptic ulcer disease, likewise several studies reported a similar involvement including a recent study in 2021 by Jacob A et al, in Basra-Iraq [19], Duhok-Iraq [12], and in alignment with many published articles made by different authors from South east Nigeria [8], Ethiopia [10, 11],west Nigeria [13], India [14], Mexico [16], Thailand[20] and a study by Yawar B et al in Ireland [21]. The higher incidence of perforated peptic ulcer amongst males in our society and others could be credited to the use of smoking and alcohol which is in line with a study done by Ahmed H and Razzouki H [22]. The effects of cigarette smoking on intestinal disorders include changes in intestinal irrigation and microbiome, increases in permeability of the mucosa, and impaired mucosal immune responses[23]. In addition to a suggested alteration on bicarbonate secretions from the pancreas which usually neutralize the acidity, thus predisposing to amplified acidity in the duodenal bulb [25]. A recent study in 2021 by Yim M et al connected the family members with gender risk to peptic ulcer, interestingly the authors described a higher risk of peptic ulcer disease among men living with other family members compared to those living alone [26]. This might be further researched to compare the risk of peptic ulcer disease among displaced population in our country.4.1.3. 9% were reported which approaches that reported in South east Nigeria [18] , Ethiopia; where the total complications and mortality rates were and respectively [20]. Our current reported mortality of perforated peptic ulcer is similar to that reported in India.[14] While the rate of morbidity was comparable to results described ina study from Turkey, where morbidity constituted 24. 7% [15].and in concordance with results from Ireland where morbidity and mortality were reported [21]. Whereas in a published researches by Dodiyi-Manuel A et al and by Etonyeaku AC et al in West Nigeria, the prevalence was imbalanced toward mortality (19. In Tanzaniaa [27]peer reviewed article by Chalya PL et al showed that the complication and mortality rates were 29. Thus, a tertiary well trained and equipped center can have lower rates of morbidities and mortality as seen in a study done by Suriya C et al in Thailand where

morbidity of perforated peptic ulcer and mortality rate were 9. Similarly, the percent of morbidity and mortality rate drops to 16. Surgical site infection was the commonest complications post operatively which is in agreement with several literature published and were peer reviewed by different authors from Ethiopia [10], West Nigeria [13], Turkey [15] and Thailand [20].4.2. Aging is one of the leading risk factors for most chronic diseases, even persons of the same chronological age may vary in their suitability to develop morbidities and mortality which might be related to the rate of aging, suggesting that chronological age is an imperfect proxy of biological aging [28].4.2.2. Duration of symptoms before surgery: Early surgery, either by laparoscopic or open repair, and proper sepsis management are essential for good outcome, as the period prior to surgery increased for more than 24 hours, the percentage of people having mortality and morbidity increased, our results is consistent with results of several published literature reported from west Africa [9],Ethiopia [10, 11], Turkey [15], Mexico [16] and a study by Chalya PL et al from Tanzania [27].4.2.3. Lifestyle habits It had been reported that the risk of developing peptic ulcer disease was shown to be associated with genetic inheritance, lifestyle and social status of the patients [30]. Thus, Unhealthy lifestyle habits and failure in handling stresses efficiently have been closely associated with the occurrence of Peptic ulcers. The current study showed that smoking, drinking alcohol and use of analgesics all showed a significant association with developing morbidity and mortality, which agrees with results from Basra-Iraq by Jacob AA [19] and study by Bahaddin M et al from Duhok-Iraq [12], also in agreement with studies by Yawar B et al in Ireland [21], Lee SP et al in Korea[31], Akbulut S et al from Turkey [32], Huang G et al from China [33] and Egwuonwu O et al from Nigeria [34]. In contrary, limiting the use of analgesic medications and glucocorticoids, controlling environmental and socioeconomic influences that dispose to H. Having a past medical illness The presence of past medical illnesses had a significant association with developing morbidity and mortality, agreeing with results reviewed from different published articles from Basra- Iraq by Jacob AA [19], Turkey by Ciftci F [15], Ethiopia[11],Tanzania [27], China[33]and Helsinki[35]. Intraoperative factors (Quantity & quality of intraperitoneal fluid and Ulcer Size) The current study illustrated a significant association between the quantity and quality of intraperitoneal fluid and developing complications. In a similar context a study by Bupicha JA et al from Ethiopia reported that the degree of peritoneal contamination was found to be the significant factors for morbidity and mortality [11]. Size of the perforated ulcer demonstrated a significant association with having morbidity and mortality which agrees with results from Ethiopia size of perforation [11]and a published literature by Aljiffry M et al in Saudi Arabia where large sized ulcer increased the risk of overall mortality by 3 folds compared to smaller sized ulcers this maybe due to increase in the amount of peritoneal soiling (36)

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION:

1. Perforated peptic ulcers are common and tend to affect the middle age group with a predominance in males, complications and mortality are still common among perforated peptic ulcer patients.
2. Wound infection and fistulae were the commonest reported complications.
3. The current study showed a significant association of having morbidity or mortality with older age, increase duration of symptoms prior to surgery, life style habits, presence of past medical history, quantity and quality of intraperitoneal fluid and size of the ulcer.

RECOMMENDATIONS

1. Early diagnosis and management are a direct path to successful outcomes, an attention is still needed to paid to elderly patients who also suffer from other comorbidities and who may have a difficulty in reaching to the medical care in time.
2. Monitoring the preparedness of surgical centers in terms of equipment, materials, human resources and good training can avoid unnecessary deaths.

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Abbreviations:

PUD	Peptic ulcer disease
H. pylori	Helicobacter pylori Infection.
NSAIDs	Non-steroidal anti-inflammatory drugs
GI	Gastrointestinal
PPU	Perforated peptic ulcer
WBC	White blood cells
BMI	Body mass index
DM	Diabetes mellitus
HTN	Hypertension
RIF	Right iliac fossa