

Perforated duodenal ulcer, Factors affecting on mortality and morbidity



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Abstract— A prospective study that include (100) patients who underwent emergency laparotomy for perforated duodenal ulcer during a period from May 2016 to January 2018. The operations were done in Al-Husein Teaching Hospital. The clinical finding, general risk factors, co-morbid medical diseases, operative finding, and post – operative complications were all taken in consideration. Follow-up period range from 2 weeks to 18 months. in this study,(96%) male and(4%) female with mean age of 43.13 years (range from 10 to more than 70) years. The disease was more common in rural areas (58%) than in urban areas (42%). Fifty five percent of patients gave previous history of duodenal ulcer and (45%) had no previous history of duodenal ulcer. The most common risk factors are smoking (32%) and NSIADs (25%) . In this study most of elderly patients presented with medical diseases as hypertension, diabetes mellitus, ischemic heart disease, and chronic obstructive pulmonary disease. Most patients admitted to hospital between 19 – 24 hours (21%), (8%) admitted during 6 hours, and (2%) admitted after (120) hours. Regarding the complications occur in this study; wound infections, chest infections, and paralytic ileus were the most common complications. Mortality rate occur in 2%. The most common factor that leading to development of postoperative complications is delayed in hospital admission, so, to improve the results of treatment of perforated duodenal ulcer, the diagnosis and treatment should not be delayed and the associated medical illness should be treated.

Introduction:

Peptic ulcers are focal defects in the gastric or duodenal mucosa that extend into the sub-mucosa or deeper.⁽¹⁾They may be acute or chronic, and ultimately, are caused by an imbalance between mucosal defenses and acid/peptic injury⁽²⁾. Peptic ulcer disease is one of the most common gastrointestinal disorders in the united states with prevalence of about 2%, and a lifetime cumulative prevalence of about 10%, peaking around age 70 years. Gastric ulcer has a higher mortality than duodenal ulcer because of its increased prevalence in the elderly. Recent studies have shown an increase in the rates of hospitalizations and mortality in elderly patients for the peptic ulcer complications of bleeding and perforation. Presumably, this is due to the increasingly common use of non-steroidal anti-inflammatory drugs in this elderly cohort, many of whom also have Helicobacter pylori infection⁽³⁾. The association of various probable risk factors such as (smoking, NSAIDs, steroids, alcohol, inadequate dietary intake) with duodenal ulcer perforation have been studied widely, although the effect of stress and fasting in establishment of duodenal ulcer and the development of its perforation must not be ignored⁽⁴⁾. The most common causes of peptic ulcer disease are:

1. Helicobacter pylori infection
2. Nonsteroidal anti-inflammatory drugs (NSAIDs)
3. Smoking
4. Stress
5. Other factors

Include Zollinger – Ellison Syndrome (gastrinoma), trauma, burn, cocaine, alcohol and fasting.⁽²⁾ The Perforation is the second most common complication of peptic ulcer. Most perforated peptic ulcers are located in the first part of the duodenum (35- 65%), with 25 - 45% located in the pylorus and 5 – 25% located in the stomach ⁽⁸⁾. The increase use of CT scan has greatly improved our ability to detect perforation. Suspicious finding of CT scan include unexplained intra-peritoneal fluid, pneumoperitoneum, bowel wall thickening, mesenteric fat streaking and extravasation of contrast^(11,12). Patients with hemodynamic instability, onset of symptoms longer than 24 hours in duration, those with peritonitis on physical examination and those with systemic signs of sepsis should be surgically explored. Additionally, patients who are age 70 or greater are less likely to respond to non-operative management, and should be considered for early operative intervention⁽¹⁰⁾. Perioperative shock, renal failure, delayed operative intervention more than 12 hours, significant co – morbidities, advanced age, cirrhosis, and immunocompromised have all been identified as a risk factors for adverse outcome⁽¹⁸⁾. In fact, delays of greater than 12 hours result in a 3 – fold increase in mortality, while delays of 24 hours are associated with 9-fold increase in mortality.^(13,14,15)

The presence of underlying cardiovascular or pulmonary disease, or diabetes mellitus, and hypertension, identified in approximately 50% of all patients with perforation, is associated with a mortality of up to 50%, advanced age, particularly age greater than 70 years, dramatically increases mortality^(8,15).

Patients and methods:

A prospective study that include (100) patients who underwent emergency laparotomy for perforated duodenal ulcer during a period from May 2016 to January 2018. The operations were done in Al-Husein Teaching Hospital. the patients were diagnosed in casualty as duodenal ulcer perforation . The diagnosis based on history, clinical examination and plain X-ray of the chest (P/A- view) in erect posture as well as abdominal ultrasound if available. Most of cases had pneumoperitoneum (air under diaphragm) on plain X-rays. Other investigations like blood for Hb%, white blood cell, serum blood sugar, serum amylase, blood urea and blood grouping were done in some cases. The age of patients in this study ranges from 10 to more than 70 years, mean age was (43.13) year. Ninety six patients were males and (4) patients were females. Regarding the place of residence, (58) patients live in the rural areas, while (42) patients live in urban areas. In our study, (55) patients gave a previous history of duodenal ulcer disease (this is proved by esophagoduodenoscopy which done previously) and (45) patients without a previous history of duodenal ulcer disease. The risk factors associated with perforated duodenal ulcer mentioned in this study includes; smoking, nonsteroidal anti-inflammatory drugs, steroids, fasting, stress, family history and alcoholism. Also the associated medical diseases includes hypertension, diabetes mellitus, ischemic heart disease and chronic obstructive pulmonary diseases. The preadmission time varied from (6-120) hour and most patients were admitted between 19-24 hour, about (21) patients. All patients were admitted to emergency unit and kept on nil by mouth, intravenous fluid infusion, nasogastric tube with monitoring of vital signs. Broad spectrum antibiotics given intravenously in form of third generation cephalosporin (dose is 1gram three times daily) and metronidazole (dose is 500 mg three times daily), with gastric antisecretory agents (like H₂receptor antagonist and proton pump inhibitors) and appropriate analgesia. All patients not delayed in casualty and shifted immediately to the operating theatre after resuscitation period (i.e. no post admission delay). A laparotomy was done through upper midline incision and found that moderate to large amount of free fluid collections in the peritoneal cavity in form of sero-sanguineous, bilious, and purulent fluid; and 26% of cases had gross peritoneal soiling. Forty percent of perforations were adherent by omentum at time of surgery The perforations were located at the anterior wall of first part of te duodenum and the size of perforations were varies from less than (5 mm)

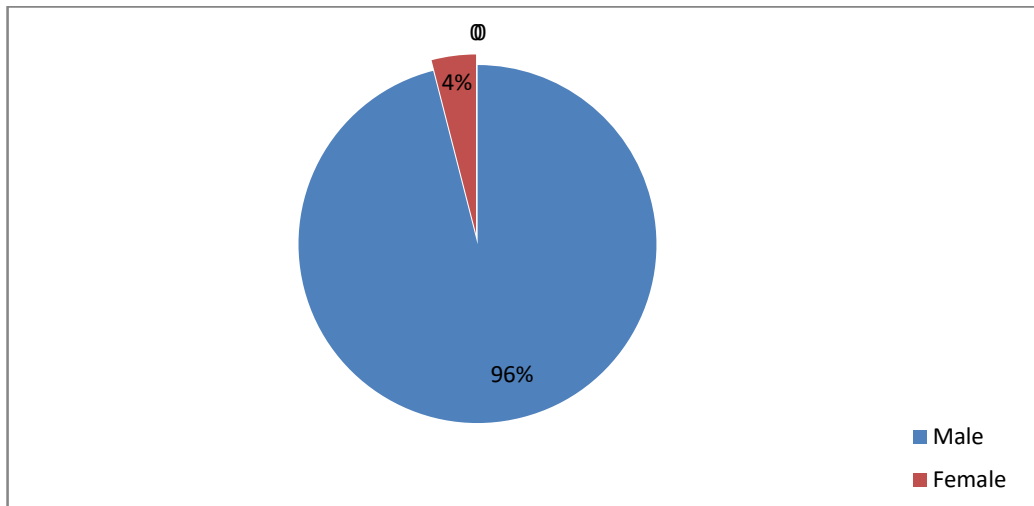
in 60% of cases, (5-10 mm) in 30% of cases, and in 10% of cases the perforation size were more than (10 mm). During surgery the site of perforation were identified and the perforation closed transversely with interrupted suture of 1/0 or 2/0 atraumatic Vicryl with omental patch. Thorough peritoneal toilet and suctioning was done and insertion one or two tube drain (near the site of closure and in pelvic cavity) laparotomy wound was closed in layers with meticulous haemostasis. Adequate postoperative care was done in all cases during hospitalization and all patients were continued on intravenous fluid, antibiotics, gastric anti-secretary agents, analgesia and nasogastric tube for several days. In uncomplicated patients the nasogastric tube removed after third or fourth postoperative days, oral fluid started and the patients were discharged from hospital after (6-8) days. In our study (24) patients were developed several complications in form of wound infections, respiratory infections, paralytic ileus, burst abdomen, septicemia, pelvic collections, renal failure, urinary tract infections, intestinal obstruction, incisional hernia and others. Regarding the mortality rate, only two patients were died out of hundred cases due to multiple organ failures and septicemia. Follow up done in all patients after discharging from the hospital. Follow up done after (2) weeks, (1) month, (2) months, (6) months, (12) months and (18) months.

Results:

Age and sex distribution:

Table (1): Age and sex distribution in patients with perforated duodenal ulcer

Age group (years)	Number of males	Percentage	Number of females	Percentage	Total	Percentage
10-20	1	1%	0	0%	1	1%
21-30	17	17%	0	0%	17	17%
31-40	35	35%	0	0%	35	35%
41-50	19	19%	0	0%	19	19%
51-60	14	14%	1	1%	15	15%
61-70	7	7%	2	2%	9	9%
>70	3	3%	1	1%	4	4%
Total	96%	96%	4	4%	100	100%



Figure(1): Male to female ratio (8)

Table (2):Place of residence

Status	Number	Percentage
Rural	58	58%
Urban	42	42%
Total	100	100%

History of duodenal ulcer disease:

Table (3): History of duodenal ulcer disease

History of duodenal ulcer	Number	Percentage
duodenal ulcer	55	55%
No history of duodenal ulcer	45	45%
Total	100	100%

Table(4): Risk factors of perforated duodenal ulcer

Associated risk factor	Number	Percentage
Smoking	32	32%
NSAIDs	25	25%
Steroids	11	11%
Fasting	10	10%
Stress	9	9%
Family history	9	9%
Alcoholism	4	4%
Multiple factors	11	11%

Associated medical diseases:

Table (5): Associated medical diseases

Medical disease	Number of patients	Percentage
Hypertension	14	14%
Diabetes mellitus	11	11%
Ischemic heart disease	7	7%
COPD	2	2%
Total	34	34%

The time between onset of symptoms and admission:

Table (6):Time between onset of symptoms and admission

Duration (hours)	Number	Percentage
6	9	9%
7-12	14	14%
13-18	16	16%
19-24	21	21%
25-36	12	12%
37-48	7	7%
49-72	13	13%
≥72	8	8%
Total	100	100%

Clinical features:**Table (7): Major symptoms at admission**

Symptoms	Number	Percentage
Severe abdominal pain	100	100%
Abdominal distention	65	65%
manifestations of shock	13	13%

Table(8): Major signs at admission

Signs	Number of patients	Percentage
Manifestations of shock	13	13%
Tachycardia	100	100%
Anemia	30	30%
Fever	30	30%
Dehydration	50	50%
Abdominal distention	65	65%
Abdominal tenderness	100	100%
Abdominal rigidity	100	100%
Absence of bowel sound	75	75%

Postoperative complications:**Table (9): Postoperative complications**

Complications	Number of patients	Percentage
Wound infections	5	20.83
Respiratory complication	5	20.83
Paralytic ileus	4	16.66
Burst abdomen	2	8.33
Septicemia	2	8.33
Pelvic collection	2	8.33
Intestinal obstruction	1	4.16
Incisional hernia	1	4.16
Urinary tract infection	1	4.16
Renal failure	1	4.16
Total	24	100 %

Discussion:

The incidence of perforated duodenal ulcer is still common in surgical practice⁽¹⁾. The age of the patients in this study is ranging from (10 to more than 70) years, mean age was (43.13) years. This was similar to that of other studies, like the results of A B M A Hannan(2005)⁽¹⁹⁾, Barman (1990)⁽²⁰⁾, and Paul. H. Jordan (1995)⁽²¹⁾, the peak incidence of duodenal ulcer perforation was in the 4th decade, 31 to 40 years. There were 4 cases (4%) of female presented with perforated duodenal ulcer in our study while in A B M A Hannan and Rayhana Awwal⁽²²⁾ studies no female affected. So in this present study the affected female may be due to increasing use of NSAIDs, steroids, and smoking. Other studies also found a male predominance like Paul. H. Jordan study showed male - female ratio 26 : 1 and Barman study reported (78 %) affected male patients. The very low incidence of female patients with duodenal ulcer perforation in comparison to male incidence may be due to great difference in habits, social, economical, and cultural activities⁽²³⁾. 58 patients (58%) with perforated duodenal ulcer live in the rural areas while 42 patients (42%) live in urban areas and this difference may be explained due to alterations in occupations, educational status, and alterations in life style, and these results were similar to that reported by Kais and Zakaria study (2005)⁽⁴⁾, while Zangana and Garota study (2004)⁽²⁴⁾, were found patients residing in the rural areas had a lower incidence of perforations (39%) than that living in the urban areas (61%). About 55 patients (55%) gave previous history of duodenal ulcer (this depending on esophagoduodenoscopy which done previously) and 45 patients (45%) without history of duodenal ulcer . This is similar to other studies such as A B M A Hannan in which 60 patients (60%) have history of duodenal ulcer, and Paul. H. Jordan reported 67 patients (67%) had previous history of duodenal ulcer .regarding the risk factors associated with perforated duodenal ulcer, in our study it was found that 32% (n=32) were smokers (most of them taking about 40 cigarette or more per day), 36% (n=36) were on NSAIDs and steroid, fasting patients were constituting about 10% of the total number, both stress and family history had 9%, while alcoholic patients had incidence about 4%. In a study done by Kais and Zakaria on (62) patients with perforated duodenal ulcer found that the smokers constitute about 69.4% (n=43), those on NSAIDs 32.2% (n=20), fasting patients about 53.2% (n=33), those with stress about 75.8% (n=47), those with family history constitute 33.9% (n=21), and alcoholic patients about 27.4% (n=17). In Zangana and Garota study on (124) patients, the incidence of three risk factors : smoking 65% (n=80), fasting 53.2% (n=66), stress 18% (n=22) .⁽⁴⁾ A positive family history of first degree relatives with duodenal ulcer increases the risk to develop ulcer disease and it's complications...⁽²⁸⁾ In this study we found some

patients with perforated duodenal ulcer were associated with one or more of medical diseases like hypertension, diabetes mellitus, ischemic heart disease and chronic obstructive pulmonary disease which influence the rate of morbidity and mortality and this is supported by other studies like Kocer et al study.⁽²⁵⁾ The duration between onset of symptoms and the admission to the hospital has a great influence on post operative complications. It range from (6 to 120) hours; and most of patients (n=21, 21%) were admitted to the hospital between 18-24 hours. Nine patients (9%) were admitted during the first 6 hours, and 2 patients (2%) were admitted after 120 hours. In A B M A Hannan study⁽¹⁹⁾ found that 19 patients (19%) admitted between 19-24 hours, 13 patients (13%) admitted during the first 6 hours, and 2 patients (2%) admitted after (120) hours. In our study there is no clear effect of size of perforation on the rate of morbidity and mortality, because we had not huge perforation size.

Conclusions:

The most common factor that leading to development of postoperative complications is delayed in hospital admission, so; to improve the results of treatment of perforated duodenal ulcer; the diagnosis and treatment should not be delayed and the associated medical illness should be treated.

Questioner

Patient name:		Age :	
Sex :		Weight:	
Blood group:		Address:	
Date of admission:		Time of admission:	
Hospital:			
Ward No.			
Bed No.			
Next of kin :			
Tel.			
Address:			
Risk factors :	Yes	No	
Steroid			Route:
NSAID			Route:
Smoking			Duration:
Alcohol drinking			
Stress			
Associated diseases	DM		
	HT		
	IHD		
	COPD		
Family history	Yes	No	
Fasting	Yes	No	

Habit: spicy diet
Preadmission delay:
Post admission delay:
Previous operation:
General condition of the patient during hospital admission:
Type of operation:
Intra-operative findings:
Duration of hospitalization:
Postoperative complications:
Previous history of attack:

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