



## Predictors of Perforation in Duodenal Ulcer in Sudanese Patients A Single Center Experience

Elssayed Osman Elssayed Ahmed<sup>1\*</sup> and Mohamed Elimam<sup>2</sup>

<sup>1</sup>Assistant Professor of General Surgery, Faculty of Medicine, Shendi University, Sudan

<sup>2</sup>Gezira University, Sudan

\*Corresponding Author: Elssayed Osman Elssayed Ahmed, Assistant Professor of General Surgery, Faculty of Medicine, Shendi University, Sudan.

DOI: 10.31080/ASMS.2020.04.0524

Received: December 31, 2019

Published: January 10, 2020

© All rights are reserved by Elssayed Osman Elssayed Ahmed and Mohamed Elimam.

### Abstract

**Background:** For quite long period of time, treatment of peptic ulcer diseases mainly depend on surgery, advance in proton pump inhibitors and *H. pylori* eradication therapy, has led to less need of elective surgery. surgical treatment is often reserved for emergency complications of the disease. the incidence rate of perforated duodenal ulcer appears not to have changed, and still quite frequent in developing countries. Graham's omental patch of the perforations is treatment of choice.

**Objective:** To determine the predictors of perforation in peptic ulcer.

**Methods:** A retrospective review of all patients with perforated duodenal ulcer seen at Almak Nimir university hospital between may 2014 to may2019. Patients' records were reviewed for demography, duration of disease, the probable risk factors and the type of surgery. Data were collected by a master sheet and was analyzed using SPSS 15.0.

**Result:** Twenty six patients were reviewed. All patients were males. The most common affected age was found to be 31 – 40 years of age (10 patients) (38.5%), followed by age 21 – 30 years (7 patients) (26.9%). A round 84.6% of patients were of a low socioeconomic class (18 patient), while 15.4% were of moderate socioeconomic class. 77% of the patients (20 patients) were manual worker (labors), 15.4% of the patients were farmers (4 patients).65.4% of the patients perforation occur during Ramadan (fasting).69.2% of the patients were smoker. no mortality was reported and 11.5% of the patient had complications.

**Conclusion:** Duodenal ulcer perforation in Sudan apparently was found to be a disease of middle aged men. Low socioeconomic class, manual workers, smoking and fasting were the main predictors of perforation in duodenal ulcer.

**Keywords:** Duodenal Ulcers; Perforations

### Introduction

Perforated peptic ulcer disease is atop surgical emergency, over the last few decades major changes in its management were adopted. The discovery of *Helicobacter pylori* as causative of peptic ulcer, the revolution in proton pump inhibitors, and the advance in technology in term of laparoscopy along with endoscopy have contributed positively in management and diagnostic index in peptic ulcer disease. Despite these advances, the rates of ulcer perforation needing surgical intervention, unfortunately have not decrease as much as the global incidence of peptic ulcer disease has; therefore,

emergent surgery is still performed widely as gold standard for the treatment of complications of peptic ulcer disease [1].

Although the incidence of PUD decrease significantly, the relative percentage of perforated ulcers remains static [2,3]. Perforation occurs in 2 - 10% of cases of PUD with a high risk of mortality, mainly among the elderly people [4,5].

Elective surgery for treatment of peptic ulcer disease (PUD) was rarely needed, definitely due to advances in drug treatment in the

last Three decades [6]. Emergency surgical treatment is often reserved for complications of the disease and not necessarily to cure the ulcer. Upper gastrointestinal tract (GIT) bleeding; perforation of the stomach, duodenum or sites of ectopic acid production; and gastric outlet obstruction were well known complications. *Helicobacter pylori* (*H. pylori*) infection has come to play a pivotal role in the etiopathogenesis of the disease [7] therefore its eradication is associated with better prognosis [8].

Duodenal perforation is a most common complication of PUD. This study shows a prevalence rate of about 4–5 cases per year. This is similar to observation earlier in Ile- Ife [9] and other centres [10,11]. This may be due to wide spread use of both antibiotics and proton pump inhibitor (PPI) which are effective in ulcer care; and are common over the counter (OTC) drugs in our environment. The number of private health facilities steady increase, some of them offering specialist surgery and medical services. However, in general, the incidence rate of perforated duodenal ulcer appears not to have changed [9,12] It is more common in males than females [12,14].

A high index of suspicion is needed for the diagnosis. an acute exacerbation in a patient with known peptic ulcer diseases the main differential should be considered [15]. The presence of air under the diaphragm in an erect chest radiograph view often confirm the diagnosis. This sign, found in up to 75% [16] of erect chest radiographs, is dependent on size of perforation and interval before presentation.

The majority of our patients as well as In a rural community generally would be in the lower socioeconomic groups. But this study identifies another risk group, clergymen or pastors. Four pastors over a five-year period were operated upon for perforated peptic ulcers. They all had gastric perforation and were all males. They were in the midst of dry fasting for between 3 and 7 days before they perforated. Two others, females one with duodenal and another with gastric perforation, were also admitted with symptoms while on a fast [17]. Several studies in the past have documented the increased frequency of peptic ulcer and its complications during Ramadan fast [18-20]. Unlike the partial hunger that exists during Ramadan, a dry fast is likely to produce a higher frequency of complications within a shorter time frame from onset of fasting.

## Material and Methods

This is a prospective observational hospital base study. All patients who were diagnosed with duodenal perforation were enrolled in this study. All of them underwent a repair for duodenal perforation in the period between may 2014 to may 2019 at Almak Nimir university hospital. Data, including patient demographics, diagnostic methods, management, and outcomes, were evaluated by chart review. All patients were treated surgically and had their diagnosis confirmed at the time of surgery.

All patients with a clinical evidence of perforated ulcer based on suspected history, abdominal signs of peritonitis suggested a perforated peptic ulcer were a subject for confirmatory imaging s.

After resuscitation all were subjected to an exploratory laparotomy. Patients were started immediately on intravenous antibiotics as well as proton pump inhibitor therapy along with nasogastric (NG) decompression once the diagnosis of a PDU was suspected.

All surgical interventions were performed by the on-call team and supervised by a senior surgeon. All patients underwent exploratory laparotomy, surgical toilet and ometal Graham patch for perforated duodenal ulcers was done following the rimming of the ulcer cater. A drain was routinely fixed at the time of surgery.

Postoperatively, patients were continued on NG decompression and the drain output was revised. The NG was removed on the clinical progress and the patients were allowed to have oral fluids and then followed according to their own clinical merits. The drains removed at the time of fair. All patients were treated with *H. pylori* eradication therapy. Patients were discharged once they started tolerating diet with no signs necessities their stay. Endoscopy was routinely performed six weeks later to assess healing of ulcers.

## Study area

Almak Nimir university hospital contain 300 beds located in Shendi city, which was in northern Sudan, situated on the east bank of the River Nile 150 km northeast of Khartoum, inhabitants mainly by farmers and labors.

- Ethics approval: The study was approved by the university research committee.

### Results

The study population include 26 patients. The most common affected age was 31 - 40 years of age (10 patients) (38.5%), followed by age 21 - 30 years (7 patients) (26.9%), 4 patients between 41- 50 years of age (15.4%), while 2 patients between 51 - 60 years of age (7.7%) and between 11 – 20 years, one patient above 61 years old (3.8%). all the patient were male. Patient characteristics are given in figure1.

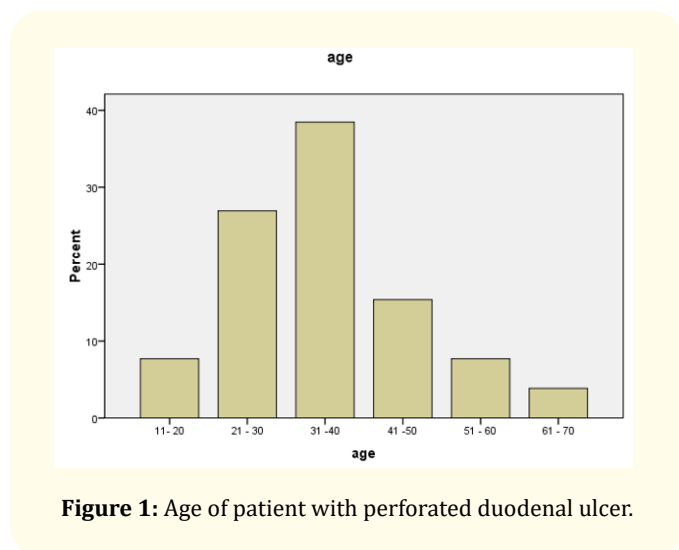


Figure 1: Age of patient with perforated duodenal ulcer.

84.6% of the patients were of low socioeconomic class (18 patient), while 15.4% were moderate socioeconomic class. 77% of the patients (20 patients) were manual worker (labors), 15.4% of the patients were farmers (4 patients), one patient was student and the other one had university degree. Patient characteristics are given in table 1.

Occupation	%	Socioeconomic status	%
Manual worker	77	Low	84.6
Farmer	15.4	Moderate	15.4
Student	3.8		
University degree	3.8		

Table 1 : Occupation and socioeconomic status.

65.4% of the patients presented during Ramadan (fasting), while 34.6 not fasting.69.2% were smoker while 30.8% were non smokers. Patient characteristics are given in table 2

Fasting	Frequency	Percent
Fasting	17	65.4
Non fasting	9	34.6
Smoking	Frequency	Percent
Smoking	18	69.2
Non smoking	8	30.8

Table 2: Fasting state and smoking

88.5% were infected by helicobacter pylori, while 11.5% free of the bacteria table 3.

Helicobacter pylori	Frequency	Percent
Positive	23	88.5
Negative	3	11.5

Table 3 : Helicobacter pylori infection

88.5% of the patients had no morbidity, 11.5% had morbidity. Fortunately enough no mortality detected table 4.

Morbidity	Frequency	Percent
No morbidity	23	88.5
Morbidity	3	11.5

Table 4: Morbidity

25 patients were duodenal 96.2%, while one patient had gastric ulcer table 5.

Type of ulcer	Frequency	Percent
Duodenal	25	96.2
Gastric	1	3.8

Table 5 :Type of peptic ulcer

### Discussion

A total of twenty-six cases of perforated peptic ulcer disease were treated in our hospital from April 2014 to April 2019 over a 5 year period giving an average of 5 cases per year, which was consistent with many studies in the literature [9,10,11,21].

Concerning gender, A dodiya-Manuel and his colleague, state that, males predominated in their study (77.8%) [21], more or less approximately similar to other studies [22,23] in our study all the

patients were males, which extremely strange in comparison of international studies, but in consideration of special cultures and traditions of our community smoking as major contributing factor in pathogenesis of peptic ulcer disease was not common among females, stressful works another incriminated factor as we will see later in this study, to some extent were males jobs.

DU perforation is predominantly a disease of middle aged men [24], other studies shows the commonest age at presentation was between 21 and 50 years with a mean of  $42.1 \pm 12.3$  [25,26,27]. Ohene-Yeboah, *et al.* [22] reported a mean of  $64.8 \pm 11.4$  years. In the series involving Caucasians, the majority of the patients were above 60 years and the incidence was higher in elderly females [28], our study show middle age with males gender exclusively which explained above.

*Helicobacter pylori* (*H. pylori*) infection has come to play a major role in the aetiopathogenesis of disease by breeching the mucosa [7]. prevalence of *H. pylori*, it has been noted to be high amongst the low socio-economic group [24,29]. Proton pump inhibitors and *H. pylori* eradication therapy have significantly decreased the rate of peptic ulcer disease complications, but perforation of duodenal ulcer is still quite frequent in developing countries. In our study, 88.5% were infected by helicobacter pylori, while 11.5% free of the bacteria. Most of the patients were mainly from the low socio-economic class 84.6%, and 77% were manual worker or labor and 15.4% farmer both were stressful work. Lawal OO, Fadiran OA, *et al.* state that perforation is of higher prevalence amongst working class individuals [9]. Despite the availability of endoscopy services worldwide, it was not affordable for low socio-economic class and this why perforation of peptic ulcer was common, so poverty is one of predictors of perforation.

Cigarette smoking and ulcerogenic drugs implicated as probable causes in as much as 75% and 30% respectively [30] other studies support smoking as major contributing factor [31,32], our study show that, 69.2% of the patients were smoker and 30.8% were non smokers.

Several studies show increase incidence of complications during Ramadan [18-20], fasting amongst Christians as a risk factor for perforation. clergymen or pastors had high incidence of perforations during fasting [17], in our study 65.4% of the patients pre-

sented during Ramadan mainly in the last ten days of one month fasting, the remaining 34.6% of the patients distributed in the rest of eleven months of the year. Fasting for already partially breeched mucosa by helicobacter serves as last straw.

Recent reports show, the mortality from perforated peptic ulcer (PPU) remains up to 27% [33-35] and complications are reported in 20 - 50% of the patients [35,36]. In our study, 88.5% of the patients had no morbidity, 11.5% had morbidity. Fortunately enough no mortality detected in our study.

Most of the studies in Africa conclude that, gastric ulcer had been considered to be a rare disease [22,37]. duodenal ulcer perforation was the commonest type of perforation seen with a duodenal ulcer to gastric ulcer perforation ratio of 2.6:1 [21] Our study was little bit gastric ulcer was rare about one patient and 25 patients were duodenal 96.2%. all the patients underwent upper gastro duodenal endoscopy to assess the healing of the ulcer, one patient his ulcer persist even after 6 week and was investigated he was a case of gastrinoma (Zollinger Ellison syndrome).

## Conclusion

Duodenal ulcer perforation is predominantly a disease of middle aged men. Low socioeconomic class, manual workers and fasting were the main predictors of perforation in duodenal ulcer.

## Bibliography

1. Søreide K, *et al.* "Strategies to improve the outcome of emergency surgery for perforated peptic ulcer". *British Journal of Surgery* 101.1 (2014): e51-64.
2. Thorsen K, *et al.* "Epidemiology of perforated peptic ulcer: age- and gender-adjusted analysis of incidence and mortality". *World Journal of Gastroenterology* 19 (2013): 347-354.
3. Sarosi GA, *et al.* "Surgical therapy of peptic ulcers in the 21<sup>st</sup> century: more common than you think". *The American Journal of Surgery* 190 (2005): 775-779.
4. Bertleff MJ and Lange JF. "Perforated peptic ulcer disease: a review of history and treatment". *Digestive Surgery* 27 (2010): 161-169.
5. Siu WT, *et al.* "Single stitch laparoscopic omental patch repair of perforated peptic ulcer". *Journal of the Royal College of Surgeons of Edinburgh* 42 (1997): 2-4.

6. Slade\_Howell H. "When repair is enough for perforated duodenal ulcer". 64.11 (2008): 521-524.
7. Ng EK., *et al.* "High Prevalence Helicobacter pylori Infection in Duodenal Perforations not caused by Non-Steroidal Anti-Inflammatory Drugs". *British Journal of Surgery* 83 (1996): 1779-1781.
8. Ng EK., *et al.* "Eradication of Helicobacter pylori prevents recurrence of ulcer after simple closure of duodenal ulcer perforation: randomized controlled trial". *Annals of Surgery* 231.2 (2000): 153-158.
9. Lawal OO., *et al.* "Clinical pattern of perforated prepyloric and duodenal ulcer at Ile-Ife, Nigeria". *Tropical Doctor* 28 (1998): 152-155.
10. Nuhu A., *et al.* "Acute Perforated Duodenal Ulcer in Maiduguri". *West African Journal of Medicine* 28.6 (2009): 384-387.
11. DO Irabor. "An audit of peptic ulcer surgery in Ibadan Nigeria". *WAJM* 24.3 (2005): 242-245.
12. Griffin GE and Organ CH. "The Natural History of Perforated Duodenal Ulcer Treated by Suture Plication". *Annals of Surgery* 183.4 (1976): 382-385.
13. Plummer JM., *et al.* "Surgical management of perforated duodenal ulcer: the changing scene". *West Indian Medical Journal* 53 (2004): 378-381.
14. Bin-Taleb AK., *et al.* "Management of perforated peptic ulcer in patients at a teaching hospital". *Saudi Medical Journal* 29 (2008): 245-250.
15. Di Saverio S., *et al.* "Diagnosis and treatment of perforated or bleeding peptic ulcers: 2013 WSES position paper". *World Journal of Emergency Surgery* 45 (2014).
16. Mehboob M., *et al.* "Peptic Duodenal Perforation-an Audit". 6.101 (2000): 103.
17. AE Dongo., *et al.* "A Five-Year Review of Perforated Peptic Ulcer Disease in Irrua, Nigeria". *Int Sch Res Notices* 2017 (2017): 8375398.
18. Gali BM., *et al.* "Perforated peptic ulcer PPU-in pregnancy during ramadan fasting". *Nigerian Journal of Medicine* 20.4 (2011): 497.
19. Gökakin AK., *et al.* "The impact of Ramadan on peptic ulcer perforation". *Ulusal Travma ve Acil Cerrahi Dergisi* 18.4 (2012): 339-343.
20. Malik GM., *et al.* "Endoscopic Evaluation of Peptic Ulcer Disease During Ramadan Fasting: A Preliminary Study". *Diagnostic and Therapeutic Endoscopy* 2.4 (1996): 219-221.
21. A Dodiya-Manuel., *et al.* "Presentation and Management Of Perforated Peptic Ulcer Disease In A Tertiary Centre In South South Nigeria". *Journal of the West African College of Surgeons* 5.3 (2015): 36-48.
22. Ohene-Yeboah M and Togbe B. "Perforated gastric and duodenal ulcers in an urban African Population". *West African Journal of Medicine* 25 (2006): 205-211.
23. Lawal OO., *et al.* "Clinical pattern of perforated prepyloric and duodenal ulcer at Ile-Ife, Nigeria". *Tropical Doctor* 28 (1998): 152-155.
24. AC Etonyeaku., *et al.* "A review of the management of perforated duodenal ulcers at a tertiary hospital in south western Nigeria". *African Health Sciences* 13.4 (2013): 907-913.
25. Griffin GE and Organ CH. "The natural history of perforated duodenal ulcer treated by suture plication". *Annals of Surgery* 183 (1976): 382-385.
26. Bin-Taleb AK., *et al.* "Management of perforated peptic ulcer in patients at a teaching hospital". *Saudi Medical Journal* 53 (2004): 378-381.
27. Walt R., *et al.* "Rising frequency of ulcer perforation among elderly people in the United Kingdom". *Lancet* 3 (1986): 489-492.
28. Chalya PL., *et al.* "Clinical profile and outcome of surgical treatment in perforated peptic ulcers in Northwestern Tanzania: A tertiary hospital experience". *World Journal of Emergency Surgery* 6 (2011): 31.
29. Gisbert JP., *et al.* "Helicobacter pylori and perforated peptic ulcer. Prevalence of the infection and role of non-steroidal anti-inflammatory drugs". *Digestive and Liver Disease* 36.2 (2004): 116-120.
30. Svanes C. "Trends in Perforated Peptic Ulcer: Incidence, Aetiology, Treatment and Prognosis". *World Journal of Surgery* 24 (2000): 277-283.
31. Rosenstock S., *et al.* "Risk factors for peptic ulcer disease: a population based prospective cohort study comprising 2416 Danish adults". *Gut* 52 (2003): 186-193.

32. Korman MG., *et al.* "Influence of cigarette smoking on healing and relapse in duodenal ulcer disease". *Gastroenterology* 85 (1983): 871-874.
33. Bae S., *et al.* "Incidence and short-term mortality from perforated peptic ulcer in Korea: a population-based study". *Journal of Epidemiology* 22.6 (2012): 508-516.
34. Møller MH., *et al.* "The Peptic Ulcer Perforation (PULP) score: a predictor of mortality following peptic ulcer perforation. A cohort study". *Acta Anaesthesiologica Scandinavica* 56 (2012): 655-662.
35. Thorsen K., *et al.* "Trends in diagnosis and surgical management of patients with perforated peptic ulcer". *Journal of Gastrointestinal Surgery* 15 (2011): 1329-1335.
36. Lohsiriwat V., *et al.* "Perforated peptic ulcer: clinical presentation, surgical outcomes, and the accuracy of the Boey scoring system in predicting postoperative morbidity and mortality". *World Journal of Surgery* 33 (2009): 80-85.
37. Kuremu RT. "Surgical management of peptic ulcer disease". *East African Medical Journal* 76 (2002): 454-456.

#### Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

**Website:** <https://www.actascientific.com/>

**Submit Article:** <https://www.actascientific.com/submission.php>

**Email us:** [editor@actascientific.com](mailto:editor@actascientific.com)

**Contact us:** +91 9182824667