PATTERN OF PRESENTATION AND OUTCOME OF PERFORATED PUD PATIENTS WHO UNDERWENT EMERGENCY SURGICAL OPERATIONS AT JUMC BETWEEN HIDAR 21, 2008 AND HIDAR, 22, 2009 E.C

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RESEARCH THESIS TO BE SUBMITTED TO THE DEPARTMENT OF SURGERY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENECES, JIMMA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE SPECIALITY CERTIFICATE IN GENERAL SURGERY

TIR, 2010 E.C
JIMMA, ETHIOPIA

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ABSTRACT

Background

Surgical acute abdomen is the commonly encountered emergencies in the practice of general surgery and for which emergency surgical operations are commonly performed. Peptic ulcer disease represents a worldwide health problem because of its high morbidity, mortality & economic loss. Perforated peptic ulcer is one of the serious complications of peptic ulcers with potential of resulting in grave outcomes. Despite this fact we have got only few published reports on this big health burden in our country so far. Hence this study will be conducted to evaluate the clinical presentation, management and outcome of patients with peptic ulcer perforation in our setting and to identify predictors of outcome of these patients.

Objective

To study clinical presentation pattern & Outcome of Perforated PUD Patients who underwent emergency Surgical Operations in JUMC between Hidar 21,2008 to Hidar 22,2009 E.C.

Method

A one year hospital based retrospective study, in JUMC, Jimma, Ethiopia from Hidar 21,2008 to Hidar 22,2009 E.C, was conducted using data from patient cards, admission records, operative log books and morbidity & mortality charts at JUMC. Data was entered into and analyzed using SPSS windows program version 24. Odds ratio and 95% CI were calculated using the chi-square test and $P < 0.05$ was considered statistically significant.

Results

Out of 40 cases operated for PPU in the study period, charts of 32 cases were analyzed making the retrieval rate 80%. 90.6% were males & 75% are under 40 years of age. Previous history of PUD & cigarette smoking were documented in 62.5% & 15.62% respectively. The post-operative complication rate is 34.4% & overall mortality of the study is 21.9%. Factors found to be significantly associated with increased complications were age above 40 (p=0.027) & treatment delay > 48 hours (p=0.016). Whereas mortality was increased by treatment delay (p=0.040) & shock at presentation (p=0.039).

Conclusion & Recommendation

Perforated peptic ulcers as we have noted from our study is a disease of the young & males unlike the figures from the developed nations. PPU has high rates of overall morbidity & mortality. Early presentation of patients to surgical care facilities may reduce the overall morbidity and mortality.

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ABBREVIATIONS

ICU: Intensive Care Unit

JUMC: Jimma University Medical Center

OR: Odds ratio

PPI: Proton Pump Inhibitors

PPU: Perforated peptic ulcer

PUD: Peptic ulcer disease

PPUD: Perforated peptic ulcer disease

NSAIDS: Nonsteroidal anti-inflammatory drugs

LMICs: Low and middle income countries

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

Perforated peptic ulcer (PPU) is a surgical emergency and is associated with short-term mortality and morbidity in up to 30% and 50% of patients, respectively. Worldwide variation in demography, socioeconomic status, *Helicobacter pylori* prevalence and usage of prescription drugs make investigation into risk factors for PPU difficult. PPU presents as an acute abdominal condition, with localized or generalized peritonitis and has high risk of developing sepsis and death (1).

Globally, the incidence of peptic ulcer disease has fallen in recent years. Despite this and recent advances in both diagnosis and management of peptic ulcer disease, namely the improvement in endoscopic facilities, eradication of H. pylori and the introduction of the PPIs, complications such as peptic ulcer perforation remain a substantial healthcare problem. This may be due to an increase in the risk factors for peptic ulcer complications. Approximately one-third of the surgical procedures done today for PUD are because of perforation (3).

Peptic ulcer perforation is a serious complication which affects almost 2-10% of peptic ulcer patients on the average. Being a life threatening complication of peptic ulcer disease, it needs special attention with prompt resuscitation and appropriate surgical management if morbidity and mortality are to be avoided (2).

The pattern of perforated PUD has been reported to vary from one geographical area to another depending on the prevailing socio-demographic and environmental factors. In the developing world, the patient population is young with male predominance, patients present late, and there is a strong association with smoking. In the west the patients tend to be elderly and there is a high incidence of ulcerogenic drug ingestion (2).

The diagnosis of perforated PUD poses a diagnostic challenge in most of cases. The spillage of duodenal or gastric contents into peritoneal cavity causing abdominal pain, shock, peritonitis, marked tenderness and decreased liver dullness offers little difficulty in diagnosis of perforations. The presence of gas under the diaphragm on plain abdominal erect X-ray is diagnostic in up to 80% of the cases (1).

Since the first description of surgery for acute perforated peptic ulcer disease, many techniques have been recommended. The recent advances in antiulcer therapy have shown that simple closure of perforation with omental patch followed by eradication of *H. Pylori* is a simple and safe option in many centers and have changed the old trend of truncal vagotomy and drainage procedures. The definitive operation for perforated PUD is performed by few surgeons (1).

Delay in diagnosis and initiation of surgical treatment of perforated PUD has been reported to be associated with high morbidity and mortality after surgery for perforated PUD. Early recognition and prompt surgical treatment of perforated PUD is of paramount importance if morbidity and mortality associated with perforated PUD are to be avoided. A successful outcome is obtained by prompt recognition of the diagnosis, aggressive resuscitation and early institution of surgical management (1).

Little research work has been done on the surgical management of perforated peptic ulcer disease in our local environment despite increase in the number of admissions of this condition from time to time. The aim of this study is to describe our experience on the surgical management of perforated peptic ulcer disease outlining the clinical presentation pattern, management and outcome of patients with peptic ulcer perforation in our setting and to identify predictors of outcome of these patients.

1.2 STATEMENTS OF THE PROBLEM

Peptic ulcers are focal defects in the gastric or duodenal mucosa that extend into the sub mucosa or deeper. PUD is one of the most common GI disorders in the United States with a prevalence of about 2%, and a lifetime cumulative prevalence of about 10%, peaking around age 70 years. Large majority of duodenal and gastric ulcers are caused by *H. pylori* infection and/or NSAID use. Smokers are about twice as likely to develop PUD than nonsmokers. (2)

More than 90% of patients with PUD complain of abdominal pain. The pain is typically non-radiating, burning in quality and located in the epigastrium. The three most common complications of PUD, in decreasing order of frequency, are bleeding, perforation, and obstruction. An acute perforation is estimated to occur in 2% to 10% of patients with a duodenal ulcer. (2)

Perforated peptic ulcer usually presents as an acute abdomen. The patient can often give the exact time of onset of the excruciating abdominal pain. Perforation is the second most common complication of peptic ulcer but nowadays a more common indication for operation than bleeding. Surgery is almost always indicated for ulcer perforation, although occasionally nonsurgical treatment can be used. (2)

Perforation of a peptic (gastric or duodenal) ulcer is a potentially fatal surgical emergency that remains a formidable health burden worldwide. The global prevalence of peptic ulcer disease has decreased in recent decades, but this has not been followed by a similar reduction in complications from peptic ulcers . The reduction in peptic ulcer disease is in part explained by advent of improved endoscopic diagnostics, the introduction of antibacterial therapy to eradicate *Helicobacter pylori* and the widespread use of proton pump inhibitors (PPIs). Yet, despite the introduction of PPIs, the rate of peptic ulcer perforation has remained stable in several regions of the world. Still, peptic ulcer disease remains a significant health and economic burden in low- and middle-income countries (LMICs). (1)

Improved medical management of peptic ulcer disease has virtually eradicated the need for acid-reducing surgery, such as proximal selective vagotomy, gastric resection and surgery performed for benign gastric outlet obstruction. The complications of peptic ulcer disease, however, in

particular bleeding and perforation, continue to present as an emergency. Bleeding ulcers are about five times more common than perforated ulcers. (1)

Non-operative management, including medication, endoscopy and interventional radiology, has decreased the role of emergency surgery to less than 2 per cent of patients; bleeding ulcer is now predominantly a medical emergency. In contrast, the prevalence of perforated peptic ulcer (PPU) has remained fairly stable over the past decades, and emergency surgery is the mainstay of treatment. As most patients with a PPU are elderly with considerable comorbidity, a high mortality rate (up to 25 per cent) and a morbidity rate of up to 50 per cent have been reported, even in recent studies. Consequently, PPU remains a frequent challenge to surgeons, and optimal treatment strategies are needed. (1)

Almost 70 per cent of deaths from peptic ulcer disease are the result of perforation. Estimated annual incidence rates of peptic ulcer hemorrhage and perforation are 19·4–57·0 and 3·8–14 per 100 000 individuals respectively. The outcome of patients presenting with a perforated ulcer depends on: Time delay to presentation and treatment, Site of perforation—gastric perforation is associated with a poorer prognosis, Patient's age, Presence of hypotension at presentation (systolic blood pressure <100). Perforated gastric ulcer carries a greater overall mortality that ranges from 10% to 40%. (3)

1.3 SIGNIFICANCE OF THE STUDY

The results of the study will help;

- ✓ Policy makers to gain insight on the role of health education for improvement of early presentation of patients to hospital when they got serious abdominal illness.
- ✓ This study result will give health professionals a better understanding of the patterns of clinical presentation & determinants of outcome in patients with perforated peptic ulcer disease
- ✓ The outcome of the study will also be of help as baseline for other future researchers.

CHAPTER TWO: LITRATURE REVIEW

Peptic ulcer disease is a major public health problem in the United States and a source of substantial health care expenditure. Perforation still being associated with the highest mortality. Peptic ulcer perforation is followed by sudden and severe epigastric pain. Mortality of emergency operation for ulcer perforation is most clearly correlated with the existence of preoperative shock, coexisting medical illness, and the presence of perforation beyond 48 hours.(3)

Study done in Netherland showed Perforation occurs in 2-10% of patients with PUD and accounts for more than 70% of deaths associated with PUD. The perforation site usually involves the anterior wall of the duodenum (60%), although it might occur on antrum (20%) and lesser-curvature gastric ulcers (20%). Duodenal ulcer is the predominant lesion of the western population, whereas gastric ulcers are more frequent in oriental countries, particularly in Japan.(18)

Gastric ulcers have a higher associated mortality and a greater morbidity resulting from hemorrhage, perforation and obstruction. The need for surgery for PPU has remained stable or even increased and the mortality of peptic ulcer surgery have not decreased since the introduction of H2 receptor antagonists and peptic ulcers are still responsible for about 20,000-30,000 deaths per year in Europe .This may be due to an increase in use of aspirin and/ or NSAID's. (3)

Prospective study done in Germany (37 patients from 11 German centers) showed median age of patients was 49 years. Male patients made up 65%. 54% of patients had gastric ulcer perforation (P<0.001). The proportion of definitive operations was 16.1%. General complications occurred in 35% of cases & the overall mortality was13%. Delayed admission >12hrs and age >60 years remained predictors for complications. (5)

A retrospective cohort study of consecutive 912 patients was conducted at a tertiary referral hospital, Nakornping Hospital in Chiang Mai, Thailand. The median age of patients was 72 (15 - 92) years. 709 patients (77.74%) were male in gender. 87 patients (9.54%) had complications. Out of this, 11 (1.21%) patients underwent re-operation, 32 (3.51%) patients suffered with SSI,

74 (8.11%) patients encountered with pneumonia and 18 (1.97%) patients died. 825 patients (90.46%) recovered without complications. The median age of post-operative patients with complication was 78.5 (15 - 92) years. (6)

A prospective case series at an academic hospital in Monrovia, Liberia. Median age was 33 years and 85% were males. A majority of the patients (70%) had a history of gastritis and antacid use. Median time from beginning of symptoms to surgery was 4.5 days. Over-all in-hospital mortality following surgical therapy for perforated peptic ulcer disease was 35%. Median length of stay among survivors was 16 days, and death occurred at median 1 day after admission. Long symptom duration and age >30 years of age were significantly associated with in hospital mortality on univariate (b= 2.60 [0.18–5.03], p= 0.035) and multivariate testing (b= 2.95 [0.02–5.88], p= 0.049). (7)

A combined retrospective and prospective study of patients who were operated for perforated peptic ulcers at Bugando Medical Centre, Tanzania. A total of 84 patients were studied. Males outnumbered females by a ratio of 1.3: 1. Their median age was 28 years and the modal age group was 21-30 years. The median duration of illness was 5.8 days. The majority of patients (69.0%) had no previous history of treatment for peptic ulcer disease. The use of NSAID, alcohol and smoking was reported in 10.7%, 85.7% and 64.3% respectively. 80 patients (9.5%) were HIV positive with a median CD4 count of 220 cells/µl. Most perforations were located on the duodenum {90.4%) with the duodenal to gastric ulcers ratio of 12.7: 1. Graham's omental patch (Graham's omentopexy) of the perforations was performed in 83.3% of cases. Complication and mortality rates were 29.8% and 10.7% respectively. The factors significantly related to complications were premorbid illness, HIV status, CD 4 count < 200 cells/µl, treatment delay and acute perforation ($P < 0.001$). Mortality rate was high in patients who had age ≥ 40 years, delayed presentation (>24 hrs.), shock at admission (systolic BP < 90 mmHg), HIV positivity, low CD4 count (<200 cells/µl), gastric ulcers, concomitant diseases and presence of complications ($P < 0.001$). The median overall length of hospital stay was 14 days. (8)

According to research done in Cote Devoir among 161 patients operated on for PPU, 36 (27.5%) experienced complications and 31 (19.3%) died. Follow-up results were the incidence of complications and mortality of 6.4 (95% CI: 4.9–8.0) per 100 person-days and 3.0 (95% CI: 1.9–4.0) per 100 person-days for incidence of mortality. The delayed hospital admission or surgical intervention may be considered as additional risk of postoperative complications or mortality in

Black African patients with PPU. Delayed time of hospital admission > 72 hours (HR= 2.6, $P < 0.0001$), and delayed time of surgical intervention between 24 and 48 hours (HR = 3.8, $P < 0.0001$). (9)

One study done in Kenya reported following results: forty four patients with perforated ulcers were admitted and treated over a two year study period. Twenty eight were analyzed (retrieval rate 63.6%). Males (86.2%) and those 35 years of age and younger (57.1%) predominated. Alcohol, smoking and prior use of non steroidal anti inflammatory drugs were respectively documented in 39.3%, 39.3% and 10.7% of patients. The complication rate was 25%. Four patients died. The factors significantly related to complications was treatment delay (p=0.007) and acute perforation (0.027). The paper concluded Perforated peptic ulcer disease is a disease of young males. Efforts to reduce delay in presentation in this population may reduce the complications. (10)

A 5-year retrospective analysis of 74 operated cases of perforated peptic ulcer that was undertake at Tikur Anbessa Hospital, Ethiopia showed Perforated peptic ulcer accounted for 3.4% of the adult emergency surgical procedures. The mean age was 32.6 years, with a male to female ratio of 7.2 to 1.0. In nearly 22.0% of the patients has no previous history of peptic ulcer disease was documented. Delay in diagnosis was noted in 95% of the cases. (11)

Most patients had duodenal ulcer perforation, and about 78% had purulent peritonitis at laparotomy. 14 died in hospital. Early presentation of patients to surgical care facilities may reduce morbidity and mortality in cases of PUP. Of 405 complicated peptic ulcer patients operated in Tikur Anbessa Hospital, Addis Ababa, from 1997 to 2001, the records of 351 patients were retrieved and retrospectively analyzed to assess the pattern of PUD complication and the outcome of surgical treatment. During the study period, complicated PUD patients comprised 3.8% of the total major surgical procedures. The male to female ratio was 5.6: 1.0. The mean age was 36.5 +/- 12.7 years. Of 351 patients, 337 (96%) had abdominal pain, in most epigastric, and 330 (94%) had vomiting as presenting complaints. Dehydration was observed in 44 (12.5%). Gastric outlet obstruction (GOO) was the commonest complication followed by perforation that necessitated surgical intervention. The commonest operative procedure was truncal vagotomy and drainage. Nearly 5.0% died in hospital, most from complicated PPU. (12)

CHAPTER THREE: OBJECTIVES

GENERAL OBJECTIVE

- To assess pattern of clinical presentation and outcome of perforated PUD patients who underwent emergency surgical operations in JUMC between Hidar 21, 2008 & Hidar 22, 2009 E.C.

SPECIFIC OBJECTIVES

- To study patterns of clinical presentation of perforated PUD patients who underwent emergency surgical operations in JUMC between Hidar 21, 2008 & Hidar 22, 2009 E.C.
- To asses outcome of perforated PUD patients who underwent emergency surgical operations in JUMC between Hidar 21, 2008 & Hidar 22, 2009 E.C.
- To identify common risk factors on a patient who presented with PPU
- To identify predictors of outcome in perforated PUD patients

CHAPTER FOUR: METHODOLOGY

4.1 STUDY AREA AND PERIOD

The study was conducted in Jimma University Medical Center (JUMC) from Hidar 21, 2008 to Hidar 22, 2009 E.C. JUMC is located 352kms Southwest of Addis Ababa in the city of Jimma. It is one of the oldest teaching hospitals in the country giving services to people living in Jimma zone and serving as a referral hospital in the South-West Ethiopia. It is also serving as a clinical post graduate specialty teaching hospital for Obstetrics and Gynecology, Internal Medicine, Pediatrics & Child Health, General Surgery, Ophthalmology and so on.

4.2 STUDY DESIGN

Hospital based retrospective cross-sectional study design for one year was used in JUMC from Hidar 21, 2008 to Hidar 22, 2009 E.C.

4.3 Population

4.3.1 Source Population

All patients who underwent emergency surgical operations for the diagnosis of PUD perforation in JUMC from Hidar 21, 2008 to Hidar 22, 2009 E.C.

4.3.2 Study Population

All patients who were admitted to surgical wards with the diagnosis of PUD perforation and undergone operation in JUMC from Hidar 21, 2008 to Hidar 22, 2009 E.C.

4.4 SAMPLING TECHNIQUE

- None probability convenience sampling was used.

4.5 VARIABLES

4.5.1 Independent Variable

- Socio-demographic information (Age, Sex, Area of residence)
- Duration of current illness
- Smoking & alcohol history
- Fasting status
- Medication usage(NSAID)
- Premorbid illness
- Shock at presentation
- Size & site of perforation
- Type of procedure done

4.5.2 Dependent Variables

- Postoperative complications
- Outcome of PUD perforation

4.6 DATA COLLECTION TECHNIQUE

First, operation log book records were reviewed to develop lists of operated cases for PUD perforation during the study period (from Hidar 21, 2008 to Hidar 22, 2009 E.C). Then, using patient's card number on the operation log book records, patient's card were sought out from the hospital's card office. Finally, data was collected from patient's cards using the checklist developed for this purpose.

4.7 DATA PROCESSING AND ANALYSIS

The collected data was cleaned, stored and checked for completeness on daily basis. Data analyzed by description of major variables, and comparison of relationships among variables using SPSS version 24 software program. Odds ratio and 95% CI were calculated using the chi-square test and $P < 0.05$ was considered statistically significant Final results presented with graphs, tables and narratives based on the nature of data.

4.8 ETHICAL CONSIDERATIONS

Formal letter was delivered from ethical committee to admission officer, major Operation Room and record keeping unit of JUMC. Privacy of patients was highly recognized by not exposing their names. Results of the study will be disseminated to concerned bodies only.

4.9 OPERATIONAL DEFINITIONS

- ***PPU***
  - Diagnosed with the combination of clinical symptoms of peritonitis and radiological signs of digestive tract perforations and ascertained after laparotomy.
- ***Post op complications***
  - Complications were defined as any major conditions occurring during & after surgery necessitating resuscitation measures or medical or surgical intervention.
- ***Mortality***
  - Mortality was defined as any death occurring during or after surgical intervention while patient is still in the hospital.
- ***Duration of current illness***
  - Denotes time interval from acute onset of symptoms to presentation to the hospital
  - Delayed is defined as duration > 48hrs.
- ***Shock***
  - Systolic blood pressure < 90mmHg

4.10 DATA QUALITY ASSURANCE

Cautious matching of information on operation notebook to patients' card was done. The collected data was checked for accuracy and completeness on a daily basis. Inconsistent data were rechecked before data analysis.

4.11 LIMITATIONS OF THE STUDY

Because of the retrospective nature of the study some of the recordings on patient's charts were incomplete or some charts were lost. The study was conducted in a tertiary and teaching hospital so it might not be a representative of the general population.

4.12 DATA DISSIMINATION PLAN

The result will be commented by the advisors and will be presented to the surgery department and after final comment is corrected the result will be submitted to CBE office. Finally, after appraisal eroticization the article might be published and used as baseline reference.

CHAPTER FIVE; RESULT

5.1 Sociodemographic characteristics of the study population

- Out of 40 emergency operated cases of PPU that were documented on the operation log books, the charts of 32 cases were found making retrieval rate of 80%. Out of 32 patients, 29 were male with M: F ratio of 9.7:1. Majority (75%) are under the age of 40 years (Table 1). The mean age is 33.84 years. Majority reside in rural areas (62.5%).

Table 1: Age frequency distribution of the study population, n=32

Age	n	%
≤20	6	18.75%
21-29	8	25%
30-39	**10**	**31.25%**
40-49	2	6.25%
50-59	2	6.25%
≥60	4	12.5%
Total	32	100%

5.2 Risk factors and Pre-Hospital Conditions

- Proportion of patients that reported prior history of PUD was 62.5%. Seven patients out of 32 claim a habit of cigarette smoking. Two patients had a known comorbid illness (both had hypertension). Five patients presented in shock at the time of their presentation.

Table 2: frequency distribution of study population based on risky behavior & prehospital condition, n=32

Risk Factors & prehospital condition	**n=32**	**%**
Hx of Peptic ulcer disease	**20**	**62.5%**
Hx of Medication use (NSAIDs)	0	0%
Hx of Cigarette smoking	**7**	**15.62%**
Hx of alcohol consumption	0	0%
Hx of comorbidities	**2**	**6.25%**
Shock at Presentation (SBP <90)	**5**	**15.62%**
Fasting?	**10**	**31.25%**

- The majority (62.5%) presented more than 48hours after onset of symptoms.

Table 3: frequency distribution of study population based on duration of current illness, n=32

Time of Presentation	n	%
<24	**8**	**25%**
24-48	4	12.5%
49-72	**14**	**43.75%**
>72	6	18.75%
Total	32	100%

5.3 Intraoperative Details

5.3.1 Intraoperative Finding (Site of perforation) & Type of procedure performed

- At laparotomy, most (90.6%) perforations were located at first part of duodenum. Simple closure of the perforations (Graham's patch) was the procedure performed in all of the cases.

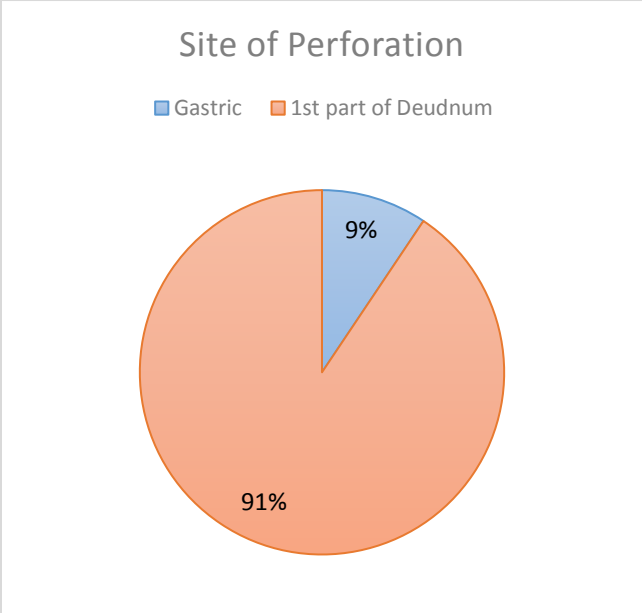

Figure 1: proportion of site of perforations

5.4 Post-Operative condition & overall outcome

- Out of 32 cases that were reviewed 11(34.4%) of them developed post-operative complications. Sepsis was the commonest complication documented at 15.6% followed by surgical site infection (9.4%). Graham's patch leak occurred in two cases (Table 4).
- 7 cases out of 32 died while in the hospital making overall mortality of this study 21.9%.

Table 4: Frequency distribution of post-operative complications, n=32

Type of Complication

	n	%
Pneumonia	**1**	**3.1**
SSI	**3**	**9.4**
Patch leak	**2**	**6.3**
Sepsis	**5**	**15.6**
Total	**11**	**34.4**
No complication	21	65.6
Total	32	100.0

- According to multivariate logistic regression analysis mortality was shown to be significantly associated with delayed presentation (p=0.40) & shock at the time of admission (p=0.039).

Table 5: predictors of mortality according to multivariate logistic regression analysis

Predictor factor	Survival n= 25		Mortality n= 7		OR & P value	
Age	n	%	n	%	OR	P value
age≤40	21	84%	3	42.9%		
age>40	4	16%	4	57.1%	0.995	0.916
Duration of current illness						
≤48 hours	11	44%	1	14.3%	0.999	**0.040**
>48 hours	14	56%	6	85.7%		
Comorbidities?						
Yes	1	4%	1	14.3%	0.999	0.899
No	24	96%	6	85.7%		
Shock at presentation?						
Yes	1	4%	4	57.1%	1.240	**0.039**
No	24	96%	3	42.9%		

- According to multivariate logistic regression analysis rates of post-operative complications was shown to be significantly associated with delayed presentation (p=0.016) & age above 40 years (p=0.0027).

Table 6: predictors of complications according to multivariate logistic regression analysis

Predictor factor	Post-operative complications n= 11		No post-operative complications n= 21		OR & P value	
Age	n	%	n	%	OR	P value
age≤40	7	63.6%	17	81%	1.060	**0.027**
age>40	4	36.4%	4	19%		
Duration of current illness						
≤48 hours	3	27.3%	9	42.9%	1.037	**0.016**
>48 hours	8	72.7%	12	57.1%		
Comorbidities?						
Yes	1	9.1%	1	4.8%	0.000	0.999
No	10	90.9%	20	95.2%		
Shock at presentation?						
Yes	3	27.3%	2	9.5%	2.060	0.372
No	8	72.7%	19	90.5%		

CHAPTER SIX: DISCUSSTION

Majority of the cases (75%) fall under the age of 40 years with mean age of 33.84 years. This figure is comparable to most other researches done in other developing countries too. But in contrary most patients with perforated peptic ulcer from developed world are elderly. For example a study done in Germany by Qin Yang et al (5) show the median age of cases was 49 years. When we see the male to female ratio of cases of PPU, males out number females by 9.7 to 1 in our case. Comparable figures can be depicted from different studies from Africa. N.A. Nasio et al (10) from Kenya reported out of 28 number of cases M: F ratio of 8.3 to 1. Research done at BLH by professor Tessema & co. (11) showed M:F ratio of 7.2 to 1.

37.5% of the cases reported no prior history of PUD which is higher than a report by Tessema et al (11) where only 22% of patients didn't claim to have PUD history. But our patients tend to be more known PUD patients than those cases from Kenya according to the research done by N.A. Nasio(10).None of the cases claims history of NSAID usage where as a study from Liberia (7) showed NSAID usage rate in up to 70% among cases presenting with PPU. One possible reason for this remarkable finding could be most of our patients may be unaware of the identity of most drugs they are taking for several of their complaints.

Majority (62.5%) of our cases present more than 48 hours after the onset of first symptoms. Possible explanation for this observation could be due to the fact that our patients often presented after having been treated in health centers or smaller private practices until they significantly deteriorated. They also often use herbal medicine according to their cultural beliefs or receive some sort of symptomatic treatments in primary care units to relieve pain.The study done by Ersumo T. et al at BLH (11) reported about 95% of the patients sought medical care delayed. When we see the mean duration of illness prior to arrival to the hospital, it was 4.7 days with ranges of 1 to 14 days.

Review of researches done by other African colleauges revealed more or less similar pictures when it comes to patients medical care seeking behavior. 4.5 days, 5.8days & 7.5 days are the respective median durations of current illness from reports by Fallah Moses et al (7), Phillipo L Chalyal et al (8) & N.A. Nasio et al (10) respectively. But the scenarios are in much contrast from results from many western researchers. For example research done in Germany (5) showed most cases present with in 12 hours of the onset of symptoms. This difference can easily be explained by various facts such as educational level, economic, psychosocial & other differences between populations in these two parts of the world.

At laparotomy 90.6% of perforations occurred at first part of duodenum & all case were managed by simple closure of the perforations. All other reports reviewed showed predominance of duodenal ulcer perforations although with different rates. A Tanzanian paper (8) gave almost identical percentage of perforated ulcer location, 90.4%. Soro

Kountele Gona et al (9) reported again predominance of duodenal ulcers though to lesser degree of differences, duodenal ulcer 53.4% as compared to gastric ulcer of 46.6%. Since all of the cases underwent similar surgical procedure, simple closure of perforations, this has automatically excluded the confounding effect of type of procedures in outcome.

Our report of overall rate of post-operative complications of 34.4% is higher than even when it is compared to similar studies from the continent. Studies from Kenya, Ivory coast & Tanzania had complications rates of 25%, 27.5% & 29.8% respectively. The reason behind this high rate of post-operative complications could be mainly due to significantly delayed presentations of the patients. Surprising to say the study by Qin Yang et al from Germany (5) showed overall complications rate of 39% which is unlike general early case presentations and good overall care of patients in that part of the world. This can be partly attributed to the relatively older age of the subjects. When we see the distribution of complications sepsis accounted for 15.6% (5 cases) followed by SSI in 9.4 %(3 cases). Patch leak happened in 2 cases (6.3%). The results of the study by Phillipo L Chalyal et al are closer to ours, where sepsis happened in 11.8% & SSI in 9.3%. Whereas report of N.A Nasio et al revealed leak rate of 10.7% which is higher is higher than the figure in this particular study.

Our report of overall mortality rate of 21.9% is higher than reports by most researches by other African colleagues. For example N.A Nasio et al reported overall case mortality of 14.3%. Similarly Soro Kountele Gona et al wrote mortality rate of 19.3%. Even a study done by one of our prominent researchers professor Tessema revealed MR of 18.9%. Probably as expected the figure is much higher than reports from the developed world, the German study had MR of only 13%. This realatively higher MR of our cases can be explained by the generally very late presentation of cases in our setting & our obvious limitations in providing optimal critical cares for the patients.

According to multivariate logistic regression model age $\geq$ 40 years & delayed presentation > 48 hours after onset of symptoms were found to be significantly associated with increased risk of post-operative complications (p=0.027 & p=0016). This as we know is a consistent finding concluded from several previous papers. Whereas shock at admission & presence of comorbid illness were not found to be associated according to this study. This could be down to the smaller number of the case studied with shock & having comorbidities.
The statistical analysis also showed overall mortality rate is found to be significantly related to shock at diagnosis (p=0.039) & duration of current illness (p=0.040).

CHAPTER SEVEN: CONCLUSION & RECOMMENDATION

Perforated peptic ulcers as we have noted from our study is a disease of the young & males unlike the figures from developed nations. PPU has high rates of overall morbidity & mortality. Age & treatment delay are found to be significantly associated with post-operative complications whereas mortality is related to shock at admission & treatment delay according to this study. Early presentation of patients to surgical care facilities may reduce the overall morbidity and mortality in cases of peptic ulcer perforation. And the significant delays in seeking medical care seen in our case highlights the need for targeting this group of the population in efforts to reduce delay in presentation.

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ANNEX

Questionnaire

Jimma University department of surgery questionnaire for retrospective study to assess pattern of clinical presentation and outcome of perforated PUD patients who underwent emergency surgical operation in JUMC from Hidar, 21, 2008 and Hidar, 22, 2009 E.C

Part one: Socio-demographic data

1. Age_____
2. Sex. 1 Male_____ 2. Female_____
3. Residence. 1. Urban 2. Rural

Part two; Risks and pre-hospital condition

4. History of peptic ulcer disease 1) Yes 2) No
5. History of Medication use (NSAID) 1) Yes 2) No
6. History of cigarette smoking 1) Yes 2) No
7. History of alcohol consumption 1) Yes 2) No
8. Co-morbidities 1) Yes 2) No
9. If yes, for Q9 specify: _____
10. Fasting? 1)Yes 2) No
11. If yes to Q10, for how long? _____
12. Duration of current illness_____
13. Shock (SBP<90mmhg) at presentation? 1)Yes 2) No

Part three; Intraoperative details

14. Intraoperative finding (site of perforation) _____
15. Type of procedure performed_____

Part four: Post-operative condition

16. Any post op complication 1) Yes____ 2) No_____
17. If yes, what kind of complication?

1)Sepsis 2) Pneumonia 3) SSI

4) Intra-abdominal abscess 5) Wound dehiscence 6) Patch leak

7) Others (specify). _____

18. Total duration of hospital stay? _____

19. Final outcome 1. Improved 2. Death