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Research Article

A Clinical Study of Peptic Ulcer Disease and its Complications in Rural Population

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Abstract: Peptic ulcer disease, as well as its myriad complications, is a common surgical problem encountered by surgeons all over. It is imperative for the surgeons to be familiar with all the facets of this disease to be able to treat the multitude of patients who suffer from this disease. A total of 80 patients with solitary peptic ulcer disease were studied with respect to age, sex, complaints and clinical signs. The diagnosis was based on clinical history and relevant investigations. Peptic ulcer disease is a common problem affecting all ages but more common in the middle ages, more so in the males, presenting with pain abdomen and, sometimes, vomiting. Duodenal ulcers are more common than gastric ulcers. Uncomplicated ulcers maybe managed either conservatively or surgically while many complicated ulcers require surgery. In conclusion, in spite of the vast advances in diagnosis and treatment of peptic ulcers, they still remain a common problem encountered by surgeons all over. Though manageable conservatively, surgery still is required in a significant number of people suffering from peptic ulcers.
Keywords: Duodenal ulcer; Gastric ulcer; Gastrojejunostomy; Peptic ulcer

INTRODUCTION:

Peptic ulcer is a defect in the mucosa of the gastrointestinal tract (GIT). In order to be called an ulcer, the defect must involve the full thickness of the mucosa reaching muscularis mucosa. Though predominantly occurring in the stomach and duodenum, they are reported to occur elsewhere in the GIT, too. This is one of the commonest structural disorders of GIT. [1]

One of the theories was first proposed by Gunzberg (1852), who attributed peptic ulcers to excessive acidity of gastric juices as a result of some disturbances in vagal control. [2] Lester Dragstedt, in 1935, suggested that gastric stasis with secondary hypergastrinemia was responsible for lesions in the gastric ulcer.

The pathogenesis of acid peptic disease has been a major source of interest to a host of investigators in a wide range of fields. Physiologists studying basic gastric processes have partly relied on the material gathered from pathologic models to delineate the normal mechanism and pattern of secretion of motility; likewise endocrinologists studying abnormal patterns of both gastric production and the hormonal control of gastric secretion of peptic ulcer have made important contributions. [3 4, 5] Both surgeons and gastroenterologists, through very fundamental efforts to understand the basic aetiology & pathogenesis of acid peptic disease, have made major breakthroughs in the development of successful operative and medical therapies. [6, 7, 8, 9] However acid peptic disease remains a major source of morbidity and mortality that every surgeon can expect to encounter on many occasions. [10, 11, 12, 13, 14]

Objectives:

- To assess the distribution of peptic ulcer in the rural population
- To assess the clinical presentations of peptic ulcer
- To evaluate and assess the effective method of treatment of peptic ulcer
- To study the complication of peptic ulcer and their management

METHODOLOGY:

The present study includes 80 cases of peptic ulcer disease admitted at our hospital catering the rural population. The study was carried out over a period of 18 months. A total of 128 cases of peptic ulcer disease were admitted in the institution at the time, out of which

80 cases were selected at random without bias. These cases include both emergency as well as elective cases. All cases admitted were studied as follows:

- A thorough clinical history was taken and patients were subjected to complete physical examination was done according to the proforma prepared
- Patients were subjected to feasible investigations to confirm the diagnosis
- Relevant treatment either medical or surgical was given

Statistical Analysis: Descriptive evaluation was done.

RESULTS:

Number of Peptic Ulcer Cases

Total no. of cases in the study was 80. Out of the 80 cases in the study, 73 patients (91.62) were of duodenal ulcer while 7(8.48%) were of gastric ulcer.

Sex Ratio

Out of 80 acid peptic disease patients, 73 (91.25%) were males and 7 (8.75%) were females.

Differential Sex Ratios in Duodenal and Gastric ulcers:

In this study, out of 73 patients with duodenal ulcer, 67(91.79%) were males and 6(8.2%) were females. Out of the 7 patients with gastric ulcer, 6(85.7%) were males and 1(1.2%) was female.

Age Incidence

Among the duodenal ulcer patients, the youngest patient was 18 years, while the oldest was 72 years old. The mean average age of the patients was 37 years. The maximum no. of patients was found in the age group of 31-0 years and the minimum no. was found in the group below 20 years.

Among the gastric ulcer patients, the youngest was 32 years while the oldest was 65 years (Table 1).

Table 1: Age incidence

Age in Years	Duodenal Ulcer	Gastric Ulcer
Upto 20 years	5(6.8%)	0
21-30 Years	19(26%)	0
31-40 Years	26(35.6%)	2(28.5%)
41-50 Years	11(15%)	3(42.8%)
51-60 Years	5(6.8%)	0
61 Years and above	7(9.6%)	1(14.3%)

Duration of symptoms

The shortest duration of symptoms was 4 days and the maximum was 11 years. With duodenal ulcers, the duration of symptoms was between 1-5 years in maximum no. of patients. The mean duration was 3.6 years. In a majority of gastric ulcers, the duration of symptoms was less than 6 months. However, there were 2 cases of gastric ulcer which had a much longer duration of symptoms.

Pain abdomen was the presenting complaint in a majority of the duodenal ulcer patients 71 out of the 73 patients (97.26%) presenting with pain. All the patients of gastric ulcers had pain abdomen as the presenting complaint (Table 2).

Table 2: Symptomatology

Duration	No. of duodenal ulcers	No. of gastric ulcers
<6 months	16(21.9%)	4(66.7%)
6 month to 1 year	4(5.5%)	0
1-5 Years	41(56.2%)	0
5-10 Years	9(12.3%)	1(14.3%)
>10 Years	3(4.1%)	1(14.3)

Site of pain

The commonest site of pain in both gastric and duodenal ulcer patients was in the Epigastrium (Table 3& Fig. 1).

Table 3: Site of pain

Site	Duodenal ulcer	Gastric ulcer
Epigastrium	21(31.3%)	2(33.3%)
Right Hypochondrium	8(11.9%)	0
Epigastrium and right hypochondrium	25(37.3%)	1(16.5%)
Epigastrium and umbilicus	10(14.9%)	2(33.3%)
Umbilical and rightHypochondrium	2(2.9%)	0
Umbilical and leftHypochondrium	0	1(16.5%)

Character of pain

The commonest character of pain in duodenal ulcer was burning with hunger pangs. The commonest character of pain in gastric ulcer patient was dull aching with burning occasionally(Table 4).

Table 4: Character of pain

	Duodenal ulcer	Gastric ulcer
Burning	20(29.8%)	2(28.5%)
Burning and hunger pangs	27(40.3%)	0
Dull aching	10(14.9%)	1(14.3%)
Hunger pangs	4(5.9%)	0
Discomfort	2(2.9%)	0
Dull aching and hunger pangs	4(6%)	0
Dull aching and burning	0	4(57.1%)

Radiation of pain

Radiation of pain was seen in 35.8% of the patients of duodenal ulcer and in 28.5% of the patients of gastric ulcer with the back being the commonest site in both.

Pain in relation to intake of food

76% of the patients of peptic ulcer had relationship with intake of food 62.7% of the patients with duodenal ulcer had relief of pain with intake of food while 71.4% of the gastric ulcer patients experienced aggravation of pain with intake of food. It was uncommon to have cases of DU with food causing aggravation of pain (Table 5).

Table 5: Relation to intake of food

Relation to food	Duodenal ulcer	Gastric ulcer
Aggravates	9(13.3%)	5(71.4%)
Relieves	42(62.7%)	0

Periodicity of pain

A majority of the patients of duodenal ulcer (85.1%) experienced periodicity of pain and the attacks lasted on an average of 1-2 weeks with varying intervals of pain free period. 42.8% of the gastric ulcer patients experienced periodicity of pain though it is generally not a remarkable feature.

Vomiting

Among the duodenal ulcer patients, vomiting was a complaint in 47.7% at one time or the other 68.5% of these had vomitus containing food taken immediately, while 31.25% of these had vomitus containing stale food. Only 37.55% had relief of pain after vomiting. In gastric ulcer patients, 57.1% had vomiting immediately after intake of food (Table 6).

Table 6: Vomiting

	Duodenal ulcer	Gastric ulcer
Vomiting	32(47.7%)	4(57.1%)
Vomiting immediately after taking food	22(68.7%)	4(57.1%)
Vomiting later and containing stale food	10(31.2%)	0
Relief of pain	12(37.5%)	2(28.5%)

Appetite

Among duodenal ulcer patients, 56.7%had a normal appetite and 19.4% had increased appetite while 25.4% had decreased appetite. In gastric ulcer patients, 42.8% had a normal appetite while 47.85% had a decreased appetite (Table 7).

Table 7: Appetite

Appetite	Duodenal ulcer	Gastric ulcer
Normal	38(56.72%)	3(42.8%)
Increased	13(19.4%)	0
Decreased	17(25.4%)	4(47.85%)

Change in weight

Among the duodenal ulcer patients, 76.1% of the patients had no change in weight and 2% had increased weight while 20.1% of the patients had weight loss. In gastric ulcer patients, 57.2% had no change in while 42.8% experienced weight loss (Table 8).

Table 8: Change in weight

Weight	Duodenal ulcer	Gastric ulcer
No change	51(76.1%)	4(57.2%)
Increased	2(2.9%)	0
Decreased	14(20.1%)	3(42.8%)

Vices

72.5% of the patients of duodenal ulcer patients were either smokers and / or consumed alcohol while 71% of the gastric ulcer patients were either smoker and / or consumed alcohol (Table 9).

Table 9: Vices

Habits	Duodenal ulcer	Gastric ulcer
Alcohol	3(4.1%)	1(14.3%)
Smoking	28(38.3%)	1(14.3%)
Both alcohol and smoking	22(30.1%)	3(42.8%)

Family History

10% of the duodenal ulcer patients had a positive family history while none of the gastric ulcer patients had a positive family history.

Drug history

20% of the duodenal ulcer patients and 1% of the gastric ulcer patients had a positive drug history (Table 10).

Table 10: Drug history

	Duodenal ulcer	Gastric ulcer
NSAID'S	14(19.2%)	1(14.28%)
Steroids	1(1.36%)	0
Total	15(20.5%)	1(14.28%)

Physical Findings

Tenderness could be elicited in 90% of the duodenal ulcer patients with the right hypochondrium being the commonest site, followed by the epigastrium. In gastric ulcer patients, tenderness could be elicited in 71.4% in varying sites over the abdomen (Table 11).

Table 11: Physical findings

Tenderness site	Duodenal ulcer	Gastric ulcer
Epigastrium	17(30.4%)	1(14.2%)
Right hypochondrium	25(44.7%)	0
Right hypochondrium and epigastrium	10(17.9%)	0
Umbilical	3(5.4%)	0
Umbilical and left hypochondrium	0	1(14.2%)
Epigastrium and umbilical	1(1.4%)	1(14.2%)
All over the abdomen	10(13.6%)	2(28.2%)
Total	66(90.4%)	5(71.4%)

Mode of diagnosis

The commonest mode of diagnosing both duodenal ulcers and gastric ulcers, as well as hemorrhage from peptic ulcers was upper G.I. endoscopy while erect abdominal films were used in diagnosing peptic ulcer perforations (Table 12).

Table 12: Mode of diagnosis

	Upper G.I. Endoscopy	Barium Meal X-ray	Plain X-ray abdomen
Duodenal Ulcer	54	2	10
Gastric ulcer	5	0	2

Medical treatment

Most of the peptic ulcer patients were treated by using proton pump inhibitors than H2 blockers, with antacids being added in a few patients (Table 13).

Table 13: Medical treatment

	Duodenal ulcer	Gastric ulcer
H2 blockers	26	3
Proton pump inhibitors	58	3
Antacids	8	1

Surgical treatment

28 cases of duodenal ulcer underwent truncalvagotomy with posterior gastrojejunostomy (GJ).

Complications of peptic ulcer

23.3% of the patients with duodenal ulcer had complications. The most common complication was perforation (13.7%), followed by hemorrhage (6.8%) and pyloric stenosis (6.8%) (Table 14).

Table 14: Complications of peptic ulcer

	Duodenal ulcer	Gastric ulcer
Perforation	10(13.7%)	2(28.5%)
Hemorrhage	5(6.8%)	1(14.2%)
Pyloric Stenosis	2(2.7%)	0
Total	17(27.3%)	3

Treatment for perforated peptic ulcers

In the present study, all the patients who were diagnosed to have perforated peptic ulcers underwent a laparotomy. Simple closure of perforation was carried out in 83.3% of the cases while a definitive procedure was added in 16.6% of these (Table 15).

Table 15: Treatment for perforated peptic ulcers

Type of treatment	No. of cases
Simple closure	10(83.3%)
Definitive surgical treatment	2(16.6%)
Laparotomy and drainage	0
Conservative	0

DISCUSSION:

Peptic ulcer disease remains a common problem encountered by surgeons all over, despite all the progress made in the diagnosis and treatment, both medical and surgical, of this condition. Among these, duodenal ulcer is definitely more prevalent than gastric ulcer. The patients in this study were randomly selected so as to include various types of peptic ulcers that are regularly seen. Peptic ulcer disease is a common disease in South India where the staple diet contains rice and less common in states where the staple diet is wheat. Duodenal ulcer is more common than gastric ulcer; about 75 to 80% of the peptic ulcers are found in the duodenum.

Age Incidence

Peptic ulcer may be found in any age group, from adolescence to the geriatric age. However, in the newborn too peptic ulcers are known to occur, albeit the acute variety. Chronic peptic ulcers are rare prior to puberty. The onset of symptoms of duodenal ulcer is infrequent in males under the age of 15 years, but plateaus at about the age of 25 years and then remains relatively constant till the age of 75 years. By contrast, the occurrence of gastric ulcer before the age of 40 years is uncommon, the peak frequency being from 55 to 65 years.

In the present study, the youngest patient was 18 years old while the oldest was 72 years old, with the maximum number of patients being in the 31 to 40 year age group and the least being in the group below 20 years. The mean average age of the patient was 37 years. In Tovey's series the mean age was found to be 32 years while in Dandapat's series it was 38 years (Table 16).

Table 16: Mean age in various studies

Author	Place	Mean Age (Years)
Tovey, Tenstall et al (1975) [17]	West Africa	32
Jayaraj et al (1980)	India	40
Kellow et al (1986)	Australia	50
M.C. Dandapat et al[52] (1991)	India	38 Years
Ramesh Bharti et al (1996)	India	41 Years
Present study (2006)	India	37 Years

Sex Incidence

Male patients are more commonly affected than female patients by duodenal ulcers. In gastric ulcer, however, there is no significant difference in incidence as regards the sex of the patient. There is also a marked variance in the sex ratio with geographical locations suggesting that probably habits and environmental factors, in addition to diet, have a role to play in the causation of peptic ulcers.

Table 17 shows the sex ratio of peptic ulcer in various studies. In the present study, the male: female ratio was 11.7:1 i.e. 91.79% in males and 8.21% in females. The wide variance in these various studies could be the result of environmental and the other mentioned factors.

Table 17: Male to Female ratio in various studies

Author	Ratio
Tovey	18:1
Kooj et al	4:1
Lann et al	3:1
Bannevie et al	2:1
Present study	11.7:1

Duodenal Ulcer versus Gastric Ulcer

In the present series, duodenal ulcers were found to be much more common than gastric ulcers, in the ratio of 24:1. Table 18 compares the relative frequencies of duodenal and gastric ulcers. From these studies it is clearly apparent that duodenal ulcers occur more frequently than the gastric ulcers, which is in conjunction with other studies.

Table 18: Mean age in various studies

Author	DU : GU
Tovey et al	32:1
Hassan et al	9:1
Sumg et al	:1
Ostensen et al	1:1
Present study	24:1

The predominant symptom for gastric ulcer in the present series was pain in the epigastrium, occurring immediately after intake of food and was associated with loss of appetite and loss of weight.

Table 19: Symptamatology of gastric ulcer

Symptom	Study By Andrew H. Soll, Edward Et Al Horrocks Et Al Earlam Et Al (%)	Present Study (%)
Pain	100	100
Epigastrium	67	66.6
Right Hypochondrium	6	-
Within 30 minutes of ingestion of food	20	66.6
Increased by food intake	24	66.6
Relieved by intake of food	2-48	-
Not related to food	22-53	33.3
Radiation	3	33.3
Increased appetite	-	-
Loss of appetite	46-57	66.6
Loss of weight	2-67	66.6
Vomiting	38-73	66.6

Table 19 shows the symptoms of gastric ulcer. Pain abdomen was a constant symptom in all the patients and was most commonly seen in the epigastrium soon after intake food. Loss of appetite was also seen in a significant number of patients, as was loss of weight. Vomiting was the next frequent complaint among these patients.

Table 20 shows the symptomatology of duodenal ulcer patients. It is clear that the chief presenting complaint is pain abdomen, more so in the epigastrium and right hypochondrium. Most of these patients experienced relief of pain on intake of food. Vomiting was the next common complaint.

Table 20: Symptamatology of Duodenal Ulcers

Sympton	Andrew H. Soll, Edward Et Al; Horrocks Et Al; Earlam Et Al (%)	Present Study (%)
Pain	100	97.2
Epigastrium	61-86	31.3
Epigastrium and right hypochondrium	7-11	11.9
Within 30 minutes of intake of food	5	-
Decreased by intake of food	22-63	62.6
Increased appetite	19	19.9
Vomiting	25-57	47.8

Physical Findings

The physical examination in a patient of uncomplicated peptic ulcer is generally normal, except for the presence of tenderness in the epigastrium. However, the presence of epigastric tenderness is not specific to peptic ulceration as it can also be seen in other conditions too.

In the present study, epigastric tenderness was elicited in 90% of the duodenal ulcer patients and only 33% of the gastric ulcer patients.

Investigations

a) Fecal occult blood-elderly patients are more likely to have asymptomatic ulceration and may present with features of anemia. Fecal occult blood testing adds little to the diagnostic resolution of these people and is rarely useful as a screening procedure.

In the present study, 23.3% of duodenal ulcer and 66% of the gastric ulcer patients had a positive test for fecal occult blood.

b) Endoscopy-the adaptation of routine endoscopic evaluation of patients suspected to have peptic ulceration has led to great

improvement in the diagnostics of this condition.

In the present study, most of the patient underwent OGD as the diagnostic procedure of choice with a 100% accuracy rate and has therefore proved to be superior to barium studies for this purpose.

Complications

Table 21 shows the complication rates of duodenal ulcer as per various studies. In the present study, perforation was found to be the most common complication, followed by hemorrhage and pyloric stenosis, in that order.

Table 21: Complications

Author	Common Complications (%)		
	Perforation	**Bleeding**	**Pyloric Stenosis**
Daniel Pelot and Daniel Hollands	25	5-10	5
David Y. Graham	15-20	7-10	2
Fry J.	14	6	1
Charles Walker	15-20	10	5
Present study	13.7	6.8	2.7

Treatment

Medical line of treatment- a sizeable number of patients underwent conservative therapy in the present study with either Proton pump inhibitors or H2 blockers, with antacids being added on to most of them. Anti H. Pylori treatment was offered whenever necessary. This number equals the number of patients who underwent surgery (50%). If, however, only the list of patients who underwent elective procedures is considered, then the equation changes dramatically as 60% of these patients received only conservative therapy. Surgical line of treatment was used in 40% of uncomplicated peptic ulcer disease, mostly in patients who were not thought to be poor complaints for prolonged therapy and in those who did not respond to prolonged treatment with anti secretory drugs.

However, surgery remained the main treatment for the complications of peptic ulcer with 100% cases of both duodenal as well as gastric perforations being managed surgically. 100% of the case of pyloric obstruction received surgical treatment. However, bleeding peptic ulcers were managed conservatively. Surgical intervention is still the preferred mode of treatment for most of the complications of peptic ulcer.

CONCLUSION:

Acid peptic disease remains a common problem presenting to the surgeon despite advances in diagnosis and treatment. Duodenal ulcers are 24 times more common than gastric ulcers. Peptic ulcers tend to affect males more commonly than females in the ratio of 12:1 in duodenal ulcers and 2:1 in gastric ulcers. It is more common in the third and forth decades of life. Gastric ulcers tend to affect a slightly older subset of patients than duodenal ulcers.

The commonest complaints for which the patients were admitted was burning pain abdomen and heart burns; found in 97.3% of duodenal ulcers and abdominal pain being present in more than 90% of gastric ulcers. The duration of symptoms varied markedly from a few days to as long as 12 years. Radiation was present in 35% of duodenal ulcers and 33% of gastric ulcers.

Relation to intake of food was present in a majority of the patients. Vomiting is the second commonest complaint after pain abdomen and is frequently noticed even in uncomplicated peptic ulcers. A majority of the duodenal ulcer patients have a normal appetite while gastric ulcer patients frequently have decreased appetite. Loss of weight occurs frequently in a significant number of patients with gastric ulcer.
Smoking and alcohol are the common habits seen in these patients and maybe implicated in a majority of the recurrences as the cause.

Tenderness in the epigastrium is the commonest noticed abnormality on physical examination. The accuracy of clinical diagnosis coupled with investigations is 100%.

Upper GI endoscopy is the method of choice for investigation of uncomplicated ulcers as well as bleeding peptic ulcers, while plain X-ray abdomen is still the preferred investigation in suspected cases of perforation.

The common mode of treatment in uncomplicated peptic ulcers today is conservative in a majority of the patients, with surgical intervention as the initial mode of treatment being reserved for select subsets of patients, particularly relevant in patients from the rural areas, where the compliance with the prescribed drugs due to various reasons is poor.

Perforation is the commonest complication of peptic ulcers followed by hemorrhage and pyloric stenosis. Surgical intervention is the first line of treatment for perforation and pyloric stenosis while hemorrhage might be managed conservatively. However, the overall attributed decrease in the incidence of surgical treatment of peptic ulcer disease is yet unjustified. [15. 16, 17]

Though the introduction of proton pump inhibitors has revolutionized the treatment of peptic ulcer disease and scarce late presentation with complications in the urban population, on the contrary the scenario in the hinterland of India remains unaltered with patients presenting late with high morbidity and mortality.

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