ROLE OF BARIUM MEAL EXAMINATION IN DIAGNOSIS OF PEPTIC ULCER

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Background: Peptic ulcer is a sore in the protective lining (mucosal lining) of the gastrointestinal tract and develops when the lining is damaged. The objectives of this Descriptive Validational study were to determine the validity of Barium Meal examination in the diagnosis of peptic ulcer disease in comparison to the gold standard, i.e., endoscopic evaluation in peptic ulcer disease. The study was conducted at Radiology Department Khyber Teaching Hospital Peshawar from November 2000 to March 2004. **Methods:** A total of 115 patients with signs and symptoms of peptic ulcer disease were selected for this study and were subjected for this diagnostic modality. The diagnosis of benign/malignant peptic ulcer was made by barium meal examinations. In all these patients the diagnosis was later on confirmed by endoscopy and or surgery. **Results:** Of the 115 patients, 80 were male and 35 were female patients. Their ages ranged from 27–75 years with mean age of 49 years. Fifty two patients had duodenal ulcer, 30 patients gastric ulcer, and 33 patients had normal radiological findings. In 6 out of 30 patients with gastric ulcer had radiological evidence of malignant gastric ulcer. **Conclusion:** Efficiency of Barium meal examination in diagnosis of peptic ulcer is good and most of peptic ulcers can be diagnosed by this method.

Keyword: Barium meal, Peptic ulcer, Endoscopy.

INTRODUCTION

Peptic ulcer is a sore in the protective lining (mucosal lining) of the gastrointestinal tract and develops when the lining is damaged. The acid and enzymes (pepsin) secreted by the stomach cells eat away the wall of the stomach or upper small intestine, forming an ulcer.[1]

Until the middle of the 1980's it was believed that the major causes were stress, the genetically linked secretions of excessive stomach acid, eating too much fatty, rich and spicy foods and drinking too much alcohol and coffee.[2] it was also believed that certain personality types were more susceptible to peptic ulcers. The viewpoint was that all these factors contributed to an excessive production of stomach acids, which eroded the protective lining of the stomach, duodenum or esophagus. A relatively recent theory holds that the primary cause of peptic ulcer is a bacteria in the stomach called Helicobacter Pylori (H. Pylori).[3] Research conducted in the mid 1980's revealed the presence of this bacteria in almost 92% of cases of duodenal ulcers and 73% of cases of gastric ulcers. The bacterium causes ulcer either by stimulating increased acid production or by damaging the lining of stomach or duodenum. Factors that have been shown to increase the risk of peptic ulcer include smoking and the regular use of non steroidal anti inflammatory drugs such as aspirin, ibuprofen, indomethacin and naproxen.[4]

Until early Twentieth century the diagnosis of peptic ulcer was made on clinical grounds. In 1912, Friedenwald published the first case series of 1000 cases of peptic ulcer. In 1925, fractional test meal was being widely used for diagnostic Barium contrast studies until overtaken by rigid gastro scopes. In 1950's flexible endoscopies revolutionized the direct visualization of ulcer disease.[5–7]

For diagnosis of gastric ulcer, barium meal can be performed. This is not at all uncomfortable and involves no risk. The patient is made to swallow a white chalky substance called Barium that is visible on x-ray and then patient is made to lie down on a tilted examining table. The tilting distributes the barium evenly around upper digestive tract and x-ray can capture images at different angles. This allows the doctor to locate the ulcer and to determine its type and severity. In almost 20% cases these X rays do not detect ulcers.[8–11]

Sensitivity of barium contrast studies is higher for detection of duodenal than for gastric ulcer[16]. Radiological findings of duodenal ulcer include filling defects of duodenal bulb. The presence of a fibrinous clot in ulcer may lead to false negative findings. False positive results have been noted as high in the paediatric patient population up to 30-40% gastric out let obstruction can be detected using upper gastrointestinal imaging. Gastric ulcer may be seen as niche at the lesser or greater curvature.[12,13]

MATERIALS AND METHODS

This descriptive validational study was carried out in the radiology department of Khyber Teaching Hospital Peshawar from November 2000 to March 2004. A total of 115 patients were included in the study. The patients were referred from different medical and surgical clinics as indoor or outdoor patients.

Those patients, with symptoms and signs of peptic ulcer disease who failed to respond to an empirical trial of medical therapy, were included in the study.

Patients with conditions with symptoms and signs mimicking peptic ulcer disease, e.g., cholecystitis, were excluded from the study.

All patients (who were referred to radiology department with suspected diagnosis of peptic ulcer disease) were briefly interviewed regarding the presentation and were subjected to contrast studies of upper gastrointestinal tract. Barium meal examination was performed in all cases under fluoroscope and study findings were noted. Patients were sent to their parent wards and were followed till their definite diagnoses by endoscopy and/or surgery were made.

RESULTS

Total 115 patients were included in this study. There were 80 (69.5%) male and 35 (30.4%) female patients. Their age ranged from 27–75 years with a mean of 49±9.2 years. The different presentations of the patients are given in Table-1 and radiological findings of the patients are shown in Table-2.

Table-1: Different presentations of the patients

Symptoms	Patients	Percentage
Pain epigastrium	93	80.8
Pain Right hypochondrium	20	17.3
Pain increased by food	25	21.7
Pain relieved by food	44	38.2
Nausea and or vomiting	21	18.2
Weight loss	6	5.2
Heart burns	84	73.04
Hematemesis	8	6.9

Table-2: Radiological findings of the patients

Radiological findings	Number	Percentage
Benign gastric ulcer	24	20.8
Malignant gastric ulcer	6	5.2
Duodenal ulcer	52	45.2
Normal	33	28.6

	Endoscopy		
Barium Meal	+	-	**Total**
+	82	0	82
-	3	30	33
Total	85	30	115

Twenty-four patients (20.8%) had radiological signs of benign gastric ulcer i.e. projecting[19] lesser curvature ulcer (Niche), later on endoscopy showed that out of 24, one patient had malignant ulcer while 2 had normal findings as proved by histopathology. Six patients had evidence of malignant gastric ulcer (Lesser curvature ulcer cresentic towards lumen of stomach: Carman's meniscus sign[20] or larger greater curvature ulcer).endoscopic biopsy in these cases confirmed the said diagnosis in 5 cases, so the sensitivity in this case is 83.3%. Fifty two patients (45.2%) had signs of chronic duodenal ulcer on barium meal examination with marked deformity of duodenal bulb[15] in some cases (clover leaf appearance). Endoscopy revealed that 48 patients had duodenal ulcer, 3 had normal findings and 1 had duodenitis. Thirty three patients (28.6%) had normal radiological findings and the normal findings could be confirmed in 24 cases. The sensitivity of Barium meal in diagnoses of the diseases mentioned is 96.5%, specificity 100%, Positive predictive value 100%, and negative predictive value of 90%.

DISCUSSION

The double contrast upper gastrointestinal series makes medical and economic sense as a cost effective alternative to endoscopy for evaluating patients with dyspepsia or other upper gastrointestinal symptoms who failed to respond to an empiric trial of medical therapy.[16]

The contrast studies are capable of detecting most, clinically significant diseases, in the upper gastrointestinal tract. Furthermore, data indicate that double contrast studies can achieve a high sensitivity in diagnosis of malignant lesions without exposing the patients to unnecessary endoscopy.[10] Thus as we approach the twenty first century, the upper gastrointestinal series confirms to be available diagnostic test in modern medical practice.[14]

In our series the male patients out numbered female patients and average age was 49 years but some studies show that younger age groups can be involved by peptic ulcer.[15] Most of the patients in our study presented with pain epigastrium while others with pain right hypochondrium and or weight loss, heart burns and hematemesis. These findings are comparable to other studies.[16–18] The results of validity of our study are comparable to other studies.[13,15,16,18]

Comparative studies are reported of endoscopy and barium meal in the investigation of the oesophagus, stomach and duodenum. During a study, in 281 endoscopies there was total agreement between the two methods in 239 instances, including 101 normal, 80 peptic ulcers and nine cancers.[24] In nine instances with unequivocal follow up information there was definitive disagreement, radiology being wrong in seven (three carcinomas and four ulcers not diagnosed). Of 116 normal barium meals, 15 definitive abnormalities were demonstrated by endoscopy, including six peptic ulcer. Probable radiological diagnosis was confirmed by endoscopy in 44 instances.[19–23] A high degree of accuracy can be achieved by the selective use of both techniques, the information obtained from each considered of equal importance and neither being regarded as the final arbiter.[20]

CONCLUSION

Double contrast Barium meal examination is most reliable investigation for the diagnosis of Peptic ulcer disease.

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