



## Original Article

## Frequency of Gastrointestinal Diseases Diagnosed on Barium Contrast Studies

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## ABSTRACT

Barium is a non-invasive, low-cost imaging technology. Gastrointestinal (GIT) symptoms are common and have significant economic and social implications. **Objective:** To determine the frequency of gastrointestinal diseases diagnosed on barium contrast studies. **Methods:** This research includes 125 participants suffering from Gastrointestinal Diseases. The research was carried out at a secondary care private sector hospital in Gujranwala, Pakistan. The information was gathered between January and April of 2022. All patients who were recommended for barium examinations and those who had never surgery before were included in the study. Images were obtained for research objectives immediately after barium was taken orally. SPSS version 20 was used to enter and evaluate data. **Results:** Out of 125 Patients about 62(49.6%) were male and 63(50.4%) were female. The age ranges from (13-88 years) with a mean age of 48 years. The patients diagnose on barium study shows 11(8.8%) gastric ulcer, 7(5.6%) patients Achalasia, 19(15.2%) Diverticula, 10(8.0%) esophageal stricture, 13(10.4%) esophagitis, 5(4.0%) GERD, 7(5.6%) pyloric stenosis, 5(4.0%) SMA syndrome, 2(1.6%) others, and 46(36.8%) patients had normal radiological findings. **Conclusion:** Barium studies are a sensitive and reliable approach to identifying gastrointestinal problems. The barium studies should reclaim their place as a primary diagnostic tool by complementing endoscopy to provide physicians with information regarding the nature of the lesion.

## INTRODUCTION

Although a few diagnostic procedures are typically performed individually for patients with pharyngeal or esophageal symptoms, barium esophagography is a rare and inexpensive test that can compare swallowing function, esophageal, gastroesophageal reflux, and severity and structural irregularities all at the same time [1-3]. The gastrointestinal tract (GI), which travels from the mouth to the anus, suffers from gastrointestinal disorders. When a GI tract is tested, it looks normal, but it doesn't go well. This is called an active disease [4]. In the United States, it is estimated that 11% of the population suffers from chronic digestive disorders, with a rate of up to 35% for those 65 and older [5]. Upper gastrointestinal (GI) infections are more common in people aged 65 and over.

The incidence of gastric and duodenal ulcers and their bleeding problems is increasing in adults worldwide [6]. Active dysphagia was a common throat problem between 3.2% and 1.2% of the frequency, respectively [7]. In medicine as a radiocontrast agent, barium sulphate is extensively utilized. Barium swallows are used to assess gastroesophageal congestion, barium food is used for antrum and duodenum testing, and barium follow-up is used for small intestine testing. There are three sorts of barium courses that may be done, each with its own setup adjustment [8]. After the initial examination, the cause of the vomiting may be unknown, and a barium diet test may be needed to confirm the diagnosis and allow treatment to begin without delay and dyspepsia [9,10]. A solid

gastroscope was used for depression, did not provide a complete abdominal examination, and was not implanted in the duodenum, barium studies have remained undisputed as a major diagnostic procedure in the diagnosis of gastrointestinal disorders over the past 60 years [11]. A barium diet can be used to diagnose gastric ulcers [12]. The presence of small outpunching's (diverticula) in the muscle wall of your large intestine that forms in the weakest parts of the intestine is structural disorder diverticulosis. The sigmoid colon, the most pressurized part of the lower intestine, is the most common. Diverticular disease is most prevalent in Western countries, affecting 10% of those over the age of 40 and 50% of those over the age of 60. Gastroesophageal reflux disease (GERD) is a chronic disorder that comprises symptoms and mucosal ulcers caused by the retrograde movement of esophageal material in esophageal dyspepsia. A barium enema is a diagnostic procedure that uses X-rays to diagnose abnormalities in the colon and rectum. Unique barium-containing highlights reveal the structure of the colon and rectum to show a clear view of the X-ray image. Dysphagia is a symptom of esophageal stricture, which is a constriction of the esophagus lumen. Patients frequently report it as swallowing difficulties. The majority of esophageal strictures are caused by peptic stricture as a result of long-term GERD, accounting for 70%-80% of adult cases. The most prevalent cause of esophageal stricture development in the elderly and young children is the ingestion of caustic chemicals. when the oesophagus mucosa exposed the stomach contents. For diagnosing esophageal stricture, barium contrast swallows were reported to have 95% sensitivity. To avoid complications for patients with esophageal stricture, it's important to diagnose it early. With partial or full esophageal blockage A barium meal can be used to diagnose a stomach ulcer. This is a painless and risk-free procedure [12]. In the general population, peptic ulcer disease is estimated to affect 5% to 10% of people at some point in their lives [13, 14]. Endoscopy is not necessary to rule out a malignancy when a stricture is clearly visible on radiography. In the assessment of individuals with dysphagia and heartburn symptoms [15]. A barium swallow is used to test the gastroesophageal junction, a barium meal is used to check the antrum and duodenum, and a barium follow-up is used to assess the small bowel [15,10]. The decision between single and double-contrast barium tests is based on the patient's indication. For the barium meal, double-contrast barium tests were done, but for the barium meal follow-up, single contrast barium studies were performed. A double-contrast barium enema is a useful tool for detecting and morphologically defining polyps in the colon [16]. The esophagus or gastric cardia can cause esophageal

dysphagia. It can be caused by structural issues including strictures and webs, as well as motility abnormalities such as achalasia. Compared to endoscopy, radiological assessment of dysphagia offers several advantages, including the capacity to evaluate both structural and motility abnormalities. Unless mucosal damage is evident [17]. Oral barium administration is also beneficial in the diagnosis of small intestine volvulus. A complete obstruction is usually appropriately recognized, indicating the proper treatment, which is almost always early surgical intervention in nearly all cases. However, if barium emulsion enters the peritoneal cavity, this is a cause for concern [18].

## METHODS

This research included 125 participants suffering from Gastrointestinal Diseases. The study was conducted at the secondary care private sector hospital of Gujranwala, Pakistan. The data were collected between January 2022 and April 2022. The data included all patients advised for barium studies and the patients with no prior surgery. Images were collected for research purposes shortly after the oral administration of barium. Images taken shortly after the Barium examination indicated a significant pathological condition. Radiography equipment and an x-ray machine are used to obtain GIT radiographs. A double-contrast barium meal is a type of contrast radiography that involves taking x-rays of the esophagus and stomach with two different types of contrast to make the structures easier to see. In the mouth, a solution containing barium (a radiocontrast) was swallowed. A small layer of high-density barium was applied to the surface, and the hollow portion distended with gas. Radiographs were obtained in AP and Lateral Positions. Data were entered and analyzed on SPSS version 20.0.

## RESULTS

Table 1 explains that the study comprised 125 patients with an average age of 48.3 years. (Age range: 13-88 years).

Age of the patients	Minimum	Maximum	Mean+SD
Yrs	13.00	88.00	48.3120+15.8

**Table 1:** Age of patients

Among these, 62 (49.6%) were male and 63 (50.4%) were female, Table 2.

Gender of the patients	Frequency	Percent
Female	63	50.4
Male	62	49.6
Total	125	100.0

**Table 2:** Gender of the patients

Table 2 explains multiple signs and symptoms observed in patients are dyspepsia 81(31.9%), vomiting 67(26.4%), weight loss 21(8.3%), dysphagia 34(13.4%), painful

swallowing 21(8.3%), and heartburn 30(11.8%).

Signs and symptoms	Frequency	Percent
Dyspepsia	81	31.9
Vomitting	67	26.4
Weight loss	21	8.3
Dysphagia	34	13.4
Painful swallowing	21	8.3
Heart burn	30	11.8
Total	254	100.0

**Table 3:** Signs and symptoms of the patients

Table 3 illustrate the types of studies carried out having a frequency of Barium Swallow in 101(80.8%), barium meal and follow through 9(7.2%), barium enema 10(8.0%), and distal loopogram 5(4.0%). Findings of gastrointestinal barium studies includes normal 46(36.8%),

Type of barium study	Frequency	Percent
Barium swallow	101	80.8
Barium meal and follow-through	9	7.2
Barium enema	10	8.0
Distal loopogram	5	4.0
Total	125	100.0

**Table 4:** Type of barium study

Achalasia 7(5.6%), diverticula 19(15.2%), esophageal stricture 10(8.0%), esophagitis 13(10.4%), gastric ulcer 11(8.8%), GERD 5(4.0%), pyloric stenosis 7( 5.6%), SMA syndrome 5(4.0%), and others 2(1.6%) as explained in Table 4.

Age of the patients	Minimum	Mean+SD
Normal	46	36.8
Achalasia	7	5.6
Diverticula	19	15.2
Esophageal stricture	10	8.0
Esophagitis	13	10.4
Gastric ulcer	11	8.8
GERD (gastro esophageal reflux disease)	5	4.0
Pyloric stenosis	7	5.6
Superior mesenteric artery syndrome	5	4.0
Others	2	1.6
Total	125	100.0

**Table 5:** Findings of gastrointestinal barium studies

## DISCUSSION

The double-contrast upper gastrointestinal series is a medically and financially sound alternative to endoscopy for examining patients with dyspepsia or other gastrointestinal symptoms who have not responded to an empirical trial of medicinal treatment [19]. Most clinically relevant abnormalities in the upper gastrointestinal tract may be detected with contrast imaging. Barium swallow exams, according to a group of researchers, enable for the early detection of numerous illnesses such as gastric or esophageal disease [20, 21]. As a result, the barium sulfate-

coated region on the x-ray film will appear white. Colon blockage or possible gastrointestinal tract perforation are contraindications to barium. Barium has no obvious negative effects [10]. According to a study by Vincent et al, double-contrast barium is a reliable approach for diagnosing gastrointestinal problems, with a sensitivity of 99% [22]. On barium scans, the intramural changes are visible. On barium meal, duodenal cap cicatrization is clearly visible. H. pylori eradication from the stomach and duodenum eliminates gastritis and duodenitis and significantly minimizes ulcer recurrence. In three methods, barium contrast tests may be utilized to illustrate the GIT. Mucosal films are created by introducing a little amount of barium into the folds of the mucosa in a collapsed viscous. These images are very useful for revealing fold abnormalities in the conditions. After the viscous has been distended with barium, barium-filled images are obtained. These views are very useful for highlighting contour anomalies, rigidity, and filling irregularities [9]. Standardization is required for relatively precise barium sulfate suspension mixing. Perforations have increased due to the increased usage of gastrointestinal fiberoptic endoscopy [24]. Esophageal perforations are four times more prevalent than gastric or duodenal perforations, and they can happen during diagnostic and therapeutic endoscopic procedures [9]. The Findings of current gastrointestinal barium studies includes normal 46(36.8%), Achalasia 7(5.6%), diverticula 19 (15.2%), esophageal stricture 10(8.0%), esophagitis 13(10.4%) gastric ulcer 11(8.8%), GERD 5(4.0%), pyloric stenosis 7( 5.6%), SMA syndrome 5(4.0%), and others 2(1.6%). David J. Ott and David W. Gelfand conducted retrospective research in North Carolina. On barium examination of the esophagus, they looked at 80 individuals who had an esophageal stricture. There were 35 ladies and 45 men in the group, with ages ranging from 24 to 84. Overall, 76 out of 80 strictures were radiographically identified with a sensitivity of 95 percent. Seventy-seven of the 76 strictures found were of the short type (75 percent). The sensitivity of a well performed barium esophagogram is comparable to that of endoscopy in detecting esophageal stricture [25]. A study conducted by Muhammad Nawaz and Muhammad Jehanzaib in 2008 in Peshawar, Pakistan conducted a descriptive study. The study comprised 115 individuals with peptic ulcer disease symptoms who were randomly assigned to this diagnostic approach. To establish whether the peptic ulcer was malignant or cancerous, barium diet tests were utilized. Endoscopy and/or surgery were used to confirm the diagnosis in all of these individuals. According to the findings, 80 of the 115 patients are male and 35 are female. Their ages varied from 27 to 75 years old. There were 52 people with duodenal

ulcers, 30 with gastric ulcers, and 33 with normal radiological effects. Radiological evidence of malignant ulcers was found in 6 out of 30 patients with gastric ulcers. It has been concluded that the effectiveness of Barium diet tests in the diagnosis of peptic ulcers is good, and this method can diagnose most peptic ulcers[14].

## CONCLUSIONS

Barium studies are a sensitive and reliable approach to identifying gastrointestinal problems. The barium studies should reclaim their place as a primary diagnostic tool by complementing endoscopy by provide physicians with information regarding the nature of the lesion. For acid peptic conditions, barium studies, particularly barium meal, are an excellent screening and diagnostic approach.

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