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ETIOLOGICAL PROFILE OF MECHANICAL GASTRIC OUTLET OBSTRUCTION IN A TERTIARY CARE CENTER IN NORTH WEST INDIA

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ABSTRACT

Background: Gastric outlet obstruction (GOO) is defined as a mechanical impediment to gastric emptying, secondary to complete or partial obstruction of distal stomach, pylorus or proximal duodenum. In contrast to 1970s, when benign diseases were mainly responsible for GOO, malignancy has been the most common cause in recent decades. But there is little data regarding any change over last decade in etiological spectrum of GOO. We therefore conducted this study to find out current trends in etiological spectrum of GOO in India especially in our region.

Methods: A prospective study of GOO cases from January 2022 to December 2023 was done. Patients in whom a senior gastroenterologist was unable to negotiate the standard Gastroscope across pylorus into distal duodenum due to mechanical impediment were considered to have GOO. The data analyzed included age, gender, endoscopic findings and histopathology reports.

Results: Total 84 patients were included with mean age of 57.71±7.3 years. 63 of the 84 (75.0%) patients were male, with male to female ratio of 3.0:1.0 Etiology of GOO was malignant in 51 (60.71%) while benign in 33 (39.2%). Gastric malignancy was most common cause of malignant GOO while duodenal ulcer was most common cause of benign GOO. Conclusion: The etiology of GOO in north west India predominantly malignant (60.71%) but significant percentages (39.2%) also have benign causes. Overall gastric malignancy (39.2%) was the most common followed by peptic ulcer disease (29.7%). Males were more commonly affected with GOO than females.

Keywords: Gastric outlet obstruction (GOO), Endoscopy, Gastric malignancy, Peptic ulcer disease, Duodenal ulcer.

Introduction

Gastric outlet obstruction (GOO) is a clinical entity that can manifest with multiple symptoms, like abdominal pain, postprandial vomiting, early satiety, and weight loss. It is caused by mechanical impediment to gastric emptying which vary anatomically; distal stomach, pyloric channel, or duodenum[1]. The etiology of GOO is divided into benign or malignant. Up to 1970s, benign disease was common cause for majority of GOO in adults (of which peptic ulcer disease being most common for 90% of cases), while malignancy found in 10 to 39 percent of cases[2,3]. With the decline in peptic ulcer disease, 50 to 80 percent cases of GOO are attributable to malignancy[4-6]. In developing country like India, malignancy has been stated as the commonest cause of GOO[6-8].

Amongst malignant causes of GOO, gastric malignancy has been reported most common cause in India[6-8]. Amongst benign causes of GOO, Misra et al.[6] and Sukumar V et al[8] has reported peptic ulcer disease as the commonest cause in India[6,8]. In contrast Maharshi S et al[9] has reported that approximately equal proportions of benign GOO were due to corrosive injury; gastroduodenal tuberculosis and peptic ulcer disease.
There is paucity of data of etiological spectrum of GOO in India, We therefore conducted this study to find out current trends in etiological spectrum of gastric outlet obstruction from our region.

Methods

In this study we did a prospective study, in the Department of Gastroenterology MGMC Jaipur, a tertiary care hospital in the state of Rajasthan in Northwest India. All patients above 18 years of age, who were diagnosed to have gastric outlet obstruction on endoscopy from January 2022 to December 2023 were taken into study. Patients in whom a senior gastroenterologist was unable to negotiate the standard Gastroscope (Olympus CV-170) across the pylorus into the distal duodenum (D3 –third part) due to mechanical impediment were considered to have GOO and were taken in the study.

Histopathology reports of the biopsy obtained from obstructing area were reviewed for confirmation of the etiology of GOO. Patients of peptic ulcer disease with GOO were included when their obstruction failed to improve with medical therapy (including anti H pylori and proton pump inhibitors therapy). The diagnosis of corrosive GOO was based on a history of corrosive ingestion with evidence of injury on endoscopy. Patients with gastroparesis without any mechanical obstruction and previous diagnosis of malignancy were excluded from the study. The diagnosis of malignant GOO was based on histopathological report,
The data analyzed included age, gender, endoscopic findings and histopathology reports of the included patients. The objective of the study was to find out the various etiologies that lead to GOO. Our study was approved by the institutional ethics committee.

Statistical Analysis

Statistical analysis was performed using statistical package for social sciences (SPSS) version 22.0 for Windows (SPSS, Chicago, IL, USA). Results are displayed in tables and figures, with the categorical variables presented as numbers and percentages and mean ± standard deviation (SD), as appropriate. Unpaired T-test was used to compare the characteristics of malignant and benign etiologies of GOO.

Results

During the study period from January 2022 to December 2023, a total of 84 patients were diagnosed to have gastric outlet obstruction (GOO) and were included in the study. The mean age of the study population was 57.71±7.3 years [**Table 1**]

Table 1: Mean age of the study population and comparison of mean age of malignant and benign etiologies of Gastric Outlet Obstruction.

	Number	Mean age +-SD (years)
Study population	84	57.71+-7.3
Type of lesion		
Malignant etiology	51	60.49+-5.85
Benign etiology	33	53.42+-1.7

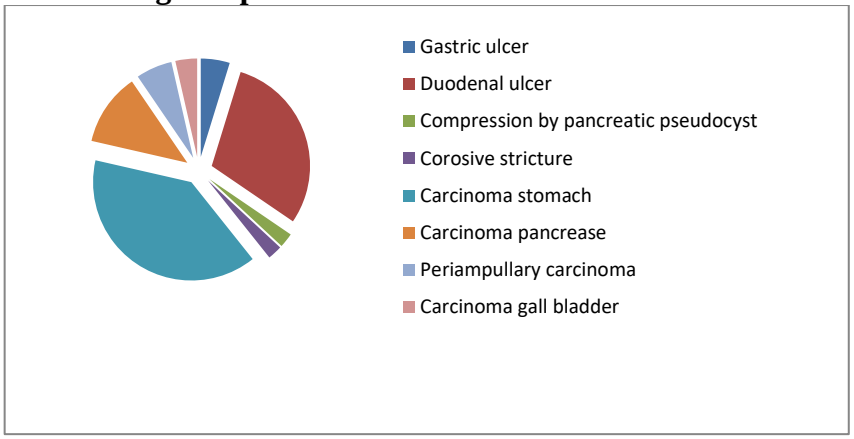
Table 2: Baseline Characteristics and etiological profile of Gastric Outlet Obstruction.

Parameter	Number (84)	percentage
Age		
18-30 year	4	4.7
31-40 years	6	7.1
41-50 years	14	16.6
51-60 years	18	21.4
61-70 years	26	30.9
>70 years	16	19
Gender		
Male	63	75.0
Female	21	25.0
Benign etiology of GOO		
Gastric ulcer	4	4.7
Duodenal ulcer	25	29.7
Compression by pancreatic pseudocyst	2	2.3
Corrosive stricture	2	2.3
Malignant etiology of GOO		
Carcinoma stomach	33	39.2
Carcinoma pancreas	10	11.9
Periampullary carcinoma	5	5.9
Carcinoma gall bladder	3	3.5

Majority of the patients (88.0%) were above the age of 40 years [**Table 2**]. 63 of the 84 (75.0%) patients were male, with male to female ratio of 3.0:1.0 [**Table 2**]. Malignant etiology for GOO was more common and is seen in 51 (60.71%) cases as compared to benign etiology seen in 33 (39.2%) cases. The mean age (60.49+-5.85) of the malignant etiology of GOO was statistically significant when compared with the mean age (53.42+-1.7) of the benign etiology of GOO [**Table 1**]. Overall gastric malignancy (39.2%) was the most common etiology followed by duodenal ulcer (29.7%), benign gastric ulcer (4.7%), pancreatic malignancy (11.9%),, periampullary carcinoma (5.9%), gallbladder cancer (3.5 extrinsic compression by pancreatic pseudocyst (2.3%), corrosive stricture (2.3%), [**Figure 1**].

Gastric malignancy and peptic ulcer disease accounted for 73.8.4% of the all cases of GOO. Out of 33 cases of gastric malignancy, 30 (90.9%) were adenocarcinoma, 2 (6.0%) were diffuse large B-cell lymphoma and 1(3%) were GIST. Gastric malignancy was the most common cause of malignant GOO while duodenal ulcer was the most common cause of the benign GOO [**Table 2**].

Figure 1: Etiological spectrum of mechanical Gastric outlet obstruction



Age distribution with underlying etiology revealed duodenal ulcer to be the most common cause of the GOO from third to fifth decade followed by gastric malignancy [**Table 3**]. Among elderly patients from 6th decade onward gastric malignancy was the most common cause of GOO followed by duodenal ulcer [**Table 3**]. The gender distribution with underlying etiology revealed in both males and females gastric malignancy is leading cause of GOO. [**Table 3**].

Table 3: Age and Gender distribution with underlying etiology of Gastric Outlet Obstruction

Parameter		CA stomach	DU	GU	CA pancreas	PERIAMPULLARY CA	CA GB	Pseudocyst compression	Corrosive stricture	Total
Age										
18-30	n	0	1	0	0	0	0	1	2	4
	%	0.0	4.0	0	0.0	0.0	0.0	50.0	100.0	4.7
31-40	n	1	2	0	1	0	1	1	0	6
	%	3.0	8.0	0	10.0	0.0	33.3	50.0	0.0	7.1
41-50	n	4	5	1	2	2	0	0	0	14
	%	12.12	20.0	25	20.0	40.0	0.0	0.0	0.0	16.6
51-60	n	7	6	1	2	1	1	0	0	18
	%	21.2	24.0	25	20.0	20.0	33.3	0.0	0.0	21.4
61-70	n	12	6	2	3	2	1	0	0	26
	%	36.3	24.0	50	30.0	40.0	33.3	0.0	0.0	30.9
>70	n	9	5	0	2	0	0	0	0	16
	%	27.2	20.0	0	20.0	0.0	0.0	0.0	0.0	19.0
Total		33	25	4	10	5	3	2	2	84
Gender										
Male	n	25	20	3	8	4	1	2	0	63
	%	75.7	80.0	75.0	80.0	80.0	33.3	100.0	0.0	75.0
Female	n	8	5	1	2	1	2	0	2	21
	%	24.2	20	25.0	20.0	20.0	66.6	0.0	100.0	25.0
Total		33	25	4	10	5	3	2	2	84

Discussion

In the present study, most patients of GOO were males with male to female ratio of 3:1. Similar observations have been reported in previous studies with males outnumbering the females as cause of GOO[6-10]. Majority of the patients were in 5th, 6th, and 7th decade of life with mean age of 57.71+-7.3 years. This finding was concurrent with previous study from south India in which the maximum numbers of patients were in their sixth and seventh decade with mean age of 59.79 ± 13.528. In a study by Misra et al. from North India, the mean age of the study population was 58±13 years, similar to our study[6].

The study demonstrates that the predominant cause for GOO in Northwest India is malignant etiology (60.71%). This concurs with findings of Misra et al.[6] from Northern India and Sukumar et al[8] from Southern India, where malignancy was reported to cause GOO in 76% and 61.4% of the total cases respectively.

In our center gastric malignancy was the most common cause of GOO, and this was especially true for elderly patients. Gastric malignancy as most common cause of GOO has been reported in other studies from India[6-8,11,12] [**Table 4**]. Pancreatic adenocarcinoma with extension to duodenum or stomach has been reported as a common cause of malignant GOO in western studies accounting for 15-25% of cases[13]. In our study pancreatic cancer was seen in 11.9% of the cases similar to western studies. It was different in lower prevalence of pancreatic cancer as cause of GOO has been reported in other studies from India[6,7,8,12] [**Table 4**].

Table 4: Comparison of the etiological spectrum of the Gastric Outlet Obstruction with available literature from different regions of India.

	Present study	Misra SP et al[6] Allahbad	Sukumar V et al[8] Newdelhi	Maharshi S et al[9] New delhi	Godavari TSRSV et al[11] Telanagana	Singh D et al[12] North east india	Purkayastha J et al[7] North-east India
Year	2022	1998	2015	2016	2016	2017	2019
Sample size	84	74	342	64	50	70	107
M:F ratio	3:1	9.6:1	3.2:1	1.7:1	-	1.9:1	1.5:1
Malignant etiology	60.7%	76%	61.5%	-	52%	61.4%	100%
Gastric Malignancy	39.2%	70.2%	59.6%	-	52%	60%	92.5%
Pancreatic Malignancy	11.9%	4%	1.7%	-	-	1.5%	1.9%
Periampullary malignacy	5.9%	-	-	-	-	-	-
CA Gallbladder	3.5%	1.3%	-	-	-	-	-
Benign malignancy	39.2%	24%	38.5%	100%	48%	38.5%	Not included
Peptic ulcer disease	34.5%	18.9%	38%	23.4%	46%	34%	
Pancreatic pseudocyst	2.3%			7.8%		1.5%	
Corrosive Stricture	2.3%	1.3%		25%	2%		

In our center peptic ulcer disease was the most common benign cause of GOO, and this was especially true for younger patients. Peptic ulcer disease as most common benign cause of GOO has also been reported in previous studies from India[6,8,11,12]. Other etiologies of benign GOO like extrinsic compression by pancreatic pseudocyst (2.3%), corrosive stricture (2.3%) and were less commonly seen in our patients. This is in accordance with the previous studies by Misra et al. from Northern India[6] and Sukumar et al[8] from Southern India but in contrast to the study by Maharshi et al from Northern India[9].

Limitations

This study is prospective in nature and analyzed the age, sex and etiology of the endoscopically confirmed GOO. The study did not prospectively follow these patients to determine their future course. The surgeries or the endoscopic interventions these patients underwent were not followed.

Conclusion

The etiology of GOO in Rajasthan, Northwest India is predominantly malignant (60.71.0%) but significant percentages (39.2%) also have benign causes. Overall gastric malignancy 33 (39.2%) was the most common etiology followed by peptic ulcer disease 29(34.5 %). Peptic ulcer disease was the most common cause of the GOO in younger age patients (from third to fifth decade) while carcinoma stomach was the most common cause of GOO among elderly patients (6th decade and above). Males were more commonly affected with GOO than females.

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