SPECTRUM OF GASTROINTESTINAL TRACT TUMORS: A CLINICOPATHOLOGICAL STUDY IN A TERTIARY CARE CENRE

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ABSTRACT

Background: Gastrointestinal (GI) tract tumors comprise a diverse group of neoplasms with varying clinical behavior and histopathological patterns. Their incidence is increasing worldwide, with notable regional differences in site distribution and tumor types. Early diagnosis and detailed histopathological evaluation are essential for appropriate management. Studying clinicopathological patterns in tertiary care settings helps in understanding disease trends and improving diagnostic and therapeutic approaches.

Aims: To evaluate the clinical profile, anatomical distribution, and histopathological spectrum of gastrointestinal tract tumors in a tertiary care center.

Materials and Methods: This prospective observational study was conducted over a period of 10 months at a tertiary care center, including 55 patients diagnosed with gastrointestinal tract tumors. Patients presenting with symptoms suggestive of gastrointestinal malignancy were evaluated clinically and investigated with laboratory tests, imaging, and endoscopy. Biopsy or resection

specimens were subjected to histopathological examination. Tumors were classified based on site and histological type, and data were analyzed statistically.

Results: Out of 55 patients, adenocarcinoma was the most common histological type, seen in 39 (70.91%) cases. Squamous cell carcinoma was observed in 7 (12.73%) cases, all involving the esophagus. Signet ring cell carcinoma was identified in 5 (9.09%) cases. Gastrointestinal stromal tumors (GIST) were seen in 2 (3.64%) cases, and lymphoma in 1 (1.82%) case. The stomach was the most frequently involved site, accounting for 25 (45.45%) cases, followed by the colorectal region in 21 (38.18%) cases. The esophagus was involved in 7 (12.73%) cases, while the small intestine was the least common site with 2 (3.64%) cases.

Conclusion: Gastrointestinal tumors in this study predominantly consisted of adenocarcinoma, with the stomach being the most commonly affected site. Histopathological evaluation remains essential for accurate diagnosis and treatment planning. Early detection strategies and awareness are crucial for improving patient outcomes.

Keywords: Gastrointestinal tumors, Adenocarcinoma, Stomach cancer, Colorectal cancer, Histopathology, Oesophageal cancer

INTRODUCTION

Gastrointestinal (GI) tract tumors constitute a major group of malignancies worldwide and are associated with significant morbidity and mortality. They encompass a wide spectrum of neoplasms arising from different anatomical sites, including the esophagus, stomach, small intestine, and colorectal region.[1,2] The clinical presentation of these tumors is often variable and nonspecific, leading to delayed diagnosis in many cases. As a result, a substantial proportion of patients present at advanced stages, limiting therapeutic options and adversely affecting prognosis.[3]

Among GI malignancies, adenocarcinoma is the most common histological type, particularly involving the stomach and colorectal region.[4] Squamous cell carcinoma predominantly affects the esophagus, especially in populations with high exposure to risk factors such as tobacco use, alcohol consumption, and dietary carcinogens.[5] Less common tumors, including signet ring cell carcinoma, gastrointestinal stromal tumors (GIST), and lymphomas, also contribute to the overall disease burden and present unique diagnostic and therapeutic challenges.

The distribution of these tumors varies based on geographic, environmental, and genetic factors, emphasizing the need for region-specific data.[6]

The pathogenesis of gastrointestinal tumors is multifactorial, involving a complex interplay of genetic mutations, chronic inflammation, environmental exposures, and lifestyle factors.[7] Conditions such as chronic gastritis, Helicobacter pylori infection, inflammatory bowel disease, and dietary habits play a significant role in tumor development. Early detection through screening and surveillance programs has been shown to improve outcomes, particularly in colorectal cancers; however, such measures are not uniformly implemented in all regions, leading to disparities in disease burden.[8]

Histopathological evaluation remains the gold standard for diagnosis and classification of GI tumors. It provides critical information regarding tumor type, grade, and biological behavior, which are essential for determining appropriate management strategies.[9] Advances in immunohistochemistry and molecular diagnostics have further enhanced the understanding of tumor biology, enabling more precise classification and targeted therapies. Nevertheless, conventional histopathology continues to be the cornerstone in most tertiary care settings, especially in resource-limited environments.[10]

Despite the growing body of literature on gastrointestinal malignancies, there is limited data from many tertiary care centers regarding the clinicopathological spectrum of these tumors. Variations in tumor distribution and histological patterns necessitate local studies to better understand regional disease characteristics. Such information is vital for planning preventive strategies, optimizing diagnostic approaches, and improving patient outcomes. The novelty of this study lies in its comprehensive evaluation of multiple GI sites within a single cohort, providing an integrated overview of tumor patterns. The rationale is to generate region-specific data that can aid clinicians and pathologists in early diagnosis, risk stratification, and management planning, thereby contributing to improved clinical outcomes.

AIMS AND OBJECTIVES

- To evaluate the clinical profile, anatomical distribution, and histopathological spectrum of gastrointestinal tract tumors in a tertiary care center.

MATERIALS AND METHODS

This prospective observational study was conducted over a period of 10 months at Department of general surgery and Oncosurgery, Sree Mookambika Institute of Medical Sciences, a tertiary care center. A total of 55 patients with clinically and radiologically suspected gastrointestinal tract malignancies were included after obtaining informed consent.

All adult patients (≥18 years) with histopathologically confirmed gastrointestinal tract malignancies involving the esophagus, stomach, small intestine, and colorectal region were included in the study. Patients with benign lesions, inflammatory or infectious gastrointestinal conditions, previously treated or recurrent malignancies, and those with inadequate or inconclusive biopsy samples were excluded. Informed consent was obtained from all participants prior to inclusion in the study.

All patients underwent a detailed clinical evaluation, including history of presenting complaints such as dysphagia, abdominal pain, weight loss, altered bowel habits, gastrointestinal bleeding, and vomiting. Relevant risk factors such as smoking, alcohol intake, dietary habits, and associated comorbidities were also documented. A thorough general and systemic examination was performed in each case.

Baseline laboratory investigations including complete blood count, liver function tests, renal function tests, and blood glucose levels were carried out for all patients. Radiological evaluation with ultrasonography and contrast-enhanced computed tomography was performed to assess tumor location, extent, and possible metastasis. Upper gastrointestinal endoscopy or colonoscopy was done depending on the clinical presentation and suspected site of lesion. During endoscopy, multiple biopsy samples were obtained from the lesion under direct visualization to improve diagnostic yield.

All biopsy and resected specimens were fixed in 10% neutral buffered formalin and processed using standard histopathological techniques. Tumors were classified according to their anatomical site and histopathological type.

Data were entered and analyzed using SPSS version 26.0. Continuous variables, such as age and laboratory parameters, were expressed as mean ± standard deviation (SD), while categorical variables, including gender, tumor site, and histopathology, were presented as frequency and percentage (n, %). Associations between categorical variables were evaluated using

Chi-square or Fisher's exact test, as appropriate. A p-value less than 0.05 was considered statistically significant.

OBSERVATION AND RESULTS

The majority of patients were in the 51–60 years age group, with a clear male predominance. (Table 1)

Variable	Category	Number (n)	Percentage (%)
Age (years)	30–40	6	10.91
	41–50	11	20.00
	51–60	18	32.73
	61–70	14	25.45
	>70	6	10.91
Gender	Male	34	61.82
	Female	21	38.18

Table 1: Demographic Characteristics

The majority of tumors were located in the stomach (25; 45.45%), followed by the colorectal region (21; 38.18%). Esophageal tumors accounted for 7 cases (12.73%), and tumors of the small intestine were the least common, observed in 2 patients (3.64%). Adenocarcinoma was the predominant histopathological type, accounting for the majority of gastrointestinal tumors in the study population. (Table 2)

Histopathology	Number (n)	Percentage (%)
Adenocarcinoma	40	72.73
Squamous cell carcinoma	7	12.73
Signet ring carcinoma	5	9.09
GIST	2	3.64
Lymphoma	1	1.82

Table 2: Histopathological Spectrum

Upper and lower GI tumors were similarly distributed across age and gender, with no significant association observed (age: p=0.91; gender: p=0.88). Tumor site appears independent of both age and gender in this study population. (Table 3)

		Upper GI (n=32)	Lower GI (n=23)	Total	p value
Age Group	≤50 years	10 (31.25)	7 (30.43)	17	**0.91**
	>50 years	22 (68.75)	16 (69.57)	38	
Gender	Male	20 (62.5)	14 (60.87)	34	**0.88**
	Female	12 (37.5)	9 (39.13)	21	

Table 3: Association Between Age, gender and Tumor Site

A statistically significant association was observed between tumor site and histopathological type ($p < 0.001$), indicating strong site-specific tumor patterns. However, no significant association was found between age or gender with histopathological type or site distribution ($p > 0.05$), suggesting that tumor characteristics were largely independent of demographic variables. (Table 4)

		Adeno n (%)	SCC n (%)	Others n (%)	Total	p value
Age Group	≤50 years	11 (64.71)	3 (17.65)	3 (17.65)	17	0.91
	>50 years	28 (73.68)	4 (10.53)	6 (15.79)	38	
Gender	Male	25 (73.53)	5 (14.71)	4 (11.76)	34	0.88
	Female	14 (66.67)	2 (9.52)	5 (23.81)	21	
Tumor site	Stomach	20 (80.0)	0	5 (20.0)	25	<0.001*
	Colorectal	20 (95.24)	0	1 (4.76)	21	
	Esophagus	0	7 (100)	0	7	
	Small intestine	0	0	2 (100)	2	

DISCUSSION

In this study of 55 patients with gastrointestinal (GI) tumors, the majority were aged 51–60 years (18; 32.73%) and 61–70 years (14; 25.45%), highlighting that advancing age is a key risk factor for tumor development due to cumulative exposure to dietary carcinogens, chronic inflammation, and other risk factors.

Parikh BJ et al.[12] reported peak incidence in the sixth decade, while Bhattacharya B et al.[13] found mean ages of 59.7 years for gastric cancer and 65.8 years for esophageal cancer, further

supporting age as a critical factor. Similarly, Mohammed A et al.[14] observed that 74.4% of patients with GI malignancies were over 40 years.

Male patients were more commonly affected in our cohort (34; 61.82%), suggesting increased susceptibility due to lifestyle factors such as tobacco use, alcohol consumption, and occupational exposure. This male predominance aligns with findings from Paragannavar V et al.[15] who reported a male-to-female ratio of 1.8:1, and Bhattacharya B et al.[13] where the male-to-female ratio was 2.4 for gastric cancer and 2.6 for esophageal cancer. Mohammed A et al.[14] also reported a male-to-female ratio of 1.5:1 among GI cancer patients.

Histopathologically, adenocarcinoma was the predominant type (40; 72.73%), followed by squamous cell carcinoma (7; 12.73%) and signet ring carcinoma (5; 9.09%). The stomach was the most frequently involved site, followed by the colorectal region, while squamous cell carcinoma was primarily seen in the esophagus, and small intestine tumors were rare.

Rani D et al.[16] similarly reported stomach as the most common site (46%), followed by esophagus (30%) and duodenum (24%), with squamous cell carcinoma predominating in esophageal lesions. Parikh BJ et al.[12] and Bansal N et al.[17] also identified adenocarcinoma as the most common malignancy overall, with squamous cell carcinoma occurring predominantly in the esophagus.

No significant association was observed between age or gender and tumor site or histopathology in our study. Upper GI tumors were present in 10 (31.25%) patients aged ≤50 years and 22 (68.75%) patients aged >50 years, while adenocarcinoma occurred in 11 (64.71%) patients aged ≤50 years and 28 (73.68%) patients aged >50 years.

Similarly, adenocarcinoma distribution was 25 (73.53%) in males versus 14 (66.67%) in females, without significant correlation. Pradhan SB et al.[18] also observed that malignant lesions were more common in patients above 50 years, particularly in the colorectal region, and Singh M et al.[19] reported that the most common age range for GI lesions was 41–60 years, comprising 36.62% of cases.

A significant association was observed between tumor site and histopathology ($p < 0.001$). Adenocarcinoma predominated in the stomach (20; 80.0%) and colorectal region (20; 95.24%), while squamous cell carcinoma occurred exclusively in the esophagus (7; 100%), and small intestine tumors were all other types (2; 100%). These findings indicate that tumor location strongly correlates with histopathological type, consistent with observations by Bamanikar S et

al.[20] who reported adenocarcinoma as the most common histological malignancy in stomach and large intestine, and squamous cell carcinoma predominantly in the esophagus.

CONCLUSION

In the present study, middle-aged males predominated. Adenocarcinoma was the most common type, mainly affecting the stomach and colorectal regions, while squamous cell carcinoma was confined to the esophagus. Age and gender showed no significant association with tumor site or histology. The significant correlation between tumor site and histopathology highlights the role of anatomical location. Future studies with larger cohorts are needed to refine diagnostic and treatment strategies.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest

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