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Original Article

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Spectrum of gastrointestinal malignancies in a rural tertiary care center

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Abstract

***Background & Aims*:** Population-based time trend studies show a rising trend in the incidence of gastrointestinal malignancies in India. However, data from the rural population is limited. The aim of this descriptive study was to see the pattern of gastrointestinal cancers and their clinic pathological features in a rural setting hospital.

***Materials & Methods*:** The pathology reports and case files of gastrointestinal malignancies diagnosed in Indian Red Cross Cancer Hospital, Nellore, India from 1 January 2020 to 31 December 2021 (2-year period) were reviewed and data analysed by SPSS version 17.

***Results*:** Totally 93 patients were included in the study. Gastrointestinal malignancies were more common in the 6th decade, and showed male preponderance. Anorectal region was the most affected site. Overall, adenocarcinoma was the predominant type of cancer. Most of them presented with well-differentiated tumors.

***Conclusion*:** This study highlights the characteristic trends of gastrointestinal cancer patients in a rural hospital setting. It emphasises the need for data interpolation across various hospital-based cancer registries.

***Keywords*:** Adenocarcinoma, Anorectal Cancer, Gastrointestinal Cancer

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Introduction

Among solid cancers, gastrointestinal cancers have perhaps been most extensively studied and molecularly characterized tumors in the last two decades. The term "Gastrointestinal (GI) cancers" is used collectively to refer to cancers of the digestive tract, and includes esophageal, liver, gastric, gallbladder and biliary tract, pancreatic, gastrointestinal stromal tumors, small bowel, colorectal, and anal cancers. Overall, GI cancers are

responsible for the most deaths from cancer in the world (1).

There is an increasing burden (incidence and mortality) in GI cancer worldwide, and India is no exception. According to a report by the Indian Council of Medical Research (ICMR) on the 'Burden of cancers in India', GI cancer accounted for 18% of the total disease burden (2). The absolute number of cancer deaths in India is projected to increase, because of population growth, urbanization, industrialization, and lifestyle changes.

Diet and gastrointestinal cancer are inextricably linked. An excessive intake of red, processed meat and alcohol, increasing consumption of packaged food with harmful preservatives, artificial coloring agents, junk food, vegetables grown in toxic water, and adulteration in food instead of plant based fiber consumption have all been considered as risk factors (1).

this unicentric study is conducted to evaluate the spectrum of neoplastic lesions of Gastrointestinal tract (GIT) and to correlate the histopathological findings with age, sex, and other clinicopathological parameters.

Materials & Methods

This descriptive, retrospective histopathological study conducted at Indian Red Cross Cancer Institute, Nellore, Andhra Pradesh, India. All the records were from 93 consecutive patients who were documented pathologically to have gastrointestinal tract cancers from January 2020 to December 2021.

The material of the study included endoscopic biopsies, colonoscopic biopsies, and surgically resected specimens. Cases with inconclusive diagnosis were excluded.

Demographic data was retrieved from the respective case files of the patients.

All tissue specimens were fixed in 10% buffered formalin and were processed in an automatic tissue processor. Multiple sections of approximately 5µm thickness were examined after Hematoxylin and Eosin staining. Special stains and immunohistochemistry were done whenever required. Results were statistically analysed by SPSS version 17 and tabulated.

Results

A total number of 93 specimens were received over the mentioned two-year period. There were 52 males (55.91%) and 41 females (44.09%), giving a male-to-female ratio of 1.27:1 (Table 1).

Table 1. Distribution of GI malignancies according to the site and gender

Site	Number of cases in Males	Number of cases in Females
Esophagus	2	3
Stomach	20	7
Small Intestine	0	2
Large Intestine (Colon)	13	13
Anorectal region	17	16
Hepatobiliary, Pancreas	0	0
Total Cases	52 (55.91%)	41 (44.09%)

Among the males, gastric malignancies (20 cases) were the most common, followed by anorectal cancers (17 cases). In females, anorectal malignancies (16 cases) were the most common, followed by colon cancers (13 cases). No cases of hepatobiliary and pancreatic malignancies were encountered in our study.

The most common age group was 51-60 years with 29 cases (31.2%) followed by 41–50 years with 28 cases (30.1%).

Table 2. Distribution of GI malignancies according to the site and age

Age Group in years	Esophagus	Stomach	Small Intestine	Colon	Anorectal Region	Total
21 – 30	0	0	0	1	0	1(1.07%)
31 – 40	0	0	0	1	2	3(3.22%)
41 – 50	2	8	1	7	10	28(30.11%)
51 – 60	0	10	1	9	9	29(31.2%)
61 – 70	2	7	0	8	7	24(25.80%)
71 - 80	1	2	0	0	5	8(8.60%)
>80	0	0	0	0	0	0

Majority of the GI malignancies were found in anorectal region (33 of 93; 35.49%) followed by stomach (27 of 93; 29.03%), and large intestine (26 of 93; 27.95%).

Table 3. Site specific distribution of GI malignancies

Site	Number of cases	Percentage
Esophagus	5	5.38%
Stomach	27	29.03%
Small Intestine	2	2.15%
Large Intestine / Colon	26	27.95%
Anorectal Region	33	35.49%

Histologically, adenocarcinoma was the main type of GI cancer, comprising about 85% of the cases, followed by squamous cell carcinoma which made up for 5.4% of all malignancies.

Esophagus: Among 5 cases, 3 were squamous cell carcinoma, and 2 were adenocarcinoma.

Stomach: Among 27 cases, 24 were adenocarcinoma, 2 were carcinoid tumors and one case was Non-Hodgkin's Lymphoma (Figure 1).

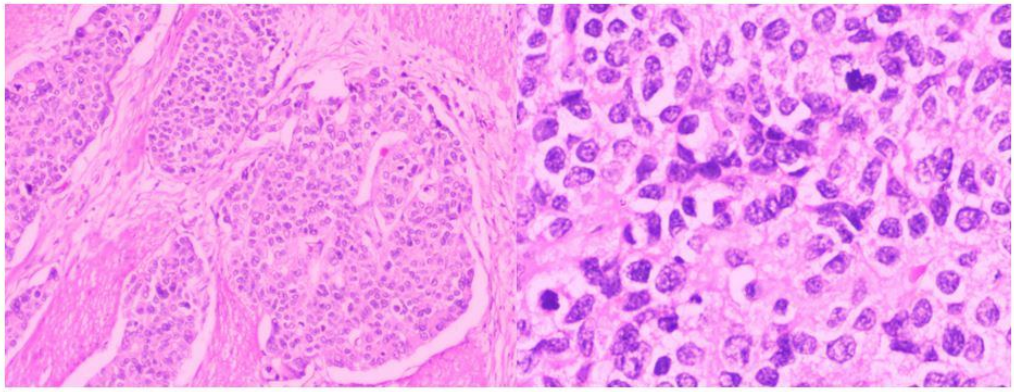

Fig. 1. Microphotograph of carcinoid tumor stomach (H & E, 10x, 40x)

Small Intestine: Among 2 cases, 1 was adenocarcinoma and the other was carcinoid tumor.

Large Intestine/Colon: All 26 cases were adenocarcinoma, with 5 being mucinous variants.

Anorectal region: Among 33 cases, 26 were adenocarcinoma with 3 cases of malignant melanoma. Two cases were squamous cell carcinoma and one case was adenosquamous carcinoma and one case was Non-Hodgkin's Lymphoma. Figures 2 and 3 shows microphotographs of malignant melanoma and NonHodgkin's lymphoma of anorectum, respectively.

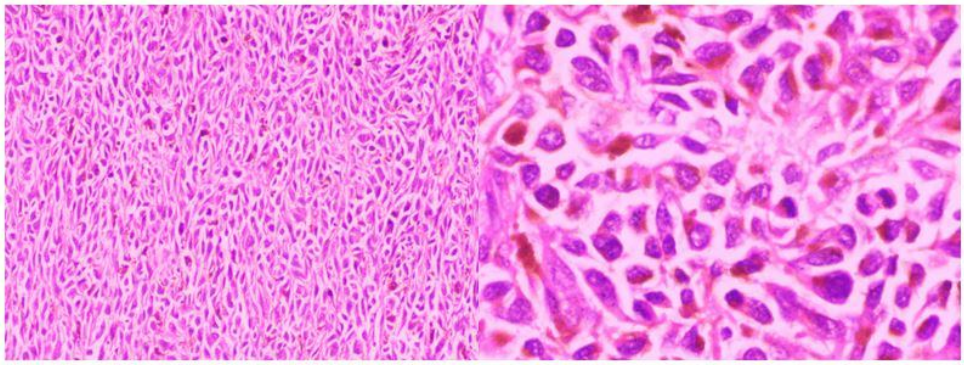

Fig. 2. Microphotograph of malignant melanoma anorectum (H & E, 10x, 40x)

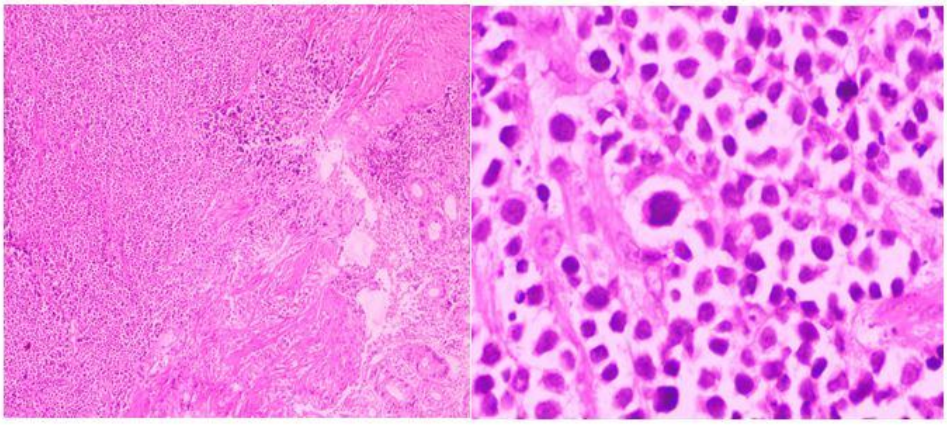

Fig. 3. Microphotograph of NonHodgkin's lymphoma anorectum (H & E,10x, 40x)

Table 4. Site Specific Histopathological Spectrum of GI Malignancies

Site	SCC	Adenocarcinoma	Adenosquamous carcinoma	Carcinoid tumors	Malignant Melanoma	Lymphoma
Esophagus	3	2	0	0	0	0
Stomach	0	24	0	2	0	1
Small Intestine	0	1	0	1	0	0
Colon	0	26	0	0	0	0
Anorectal Region	2	26	1	0	3	1
Total %	5.4	85	1.1	3.2	3.2	2.1

SCC – Squamous Cell Carcinoma

The most common type of histological differentiation seen overall was well-differentiated variant (39 of 93; 42%).

Table 5. Distribution of GI malignancies according to histological differentiation

Site	Well Differentiated	Moderately Differentiated	Poorly Differentiated
Esophagus	0	5	0
Stomach	8	7	12
Small Intestine	1	1	0
Large Intestine	12	7	7
Anorectal Region	18	4	11
Total	39 (42%)	24 (26%)	30 (32%)

Discussion

Cancer is one of the leading causes of death worldwide, accounting for nearly one in six deaths (3). The Medical Certification of Cause of Death (COD) reported in 2018 the cancer as the fifth leading cause of death, amounting to 5.7% of all deaths in India (4).

All over the world, GI tract malignancies form a significant proportion of malignant tumors in both sexes (5). Over 90% of GI malignancies are detectable just by microscopic examination alone. In India, the pattern and distribution of gastrointestinal malignancies are heterogenous.

Preponderance of males with M:F ratio of 1.27:1 was noted in our study; the results reported by Patel et al. and Bamanikar et al. also indicated similar trends (6, 7). This gender ratio favoring to males could be reflective of the fact that males are exposed to more risk factors than females.

In the present study, the highest distribution of GI malignancies was observed in 6th decade.

Similar age distribution is observed in the studies of Devi et al. (8). In contrast, more recent studies like the study of Bamanikar et al. (7) and Khatib et al. (90 showed higher incidence in 5th decade.

The study of Kalyani et al. documented a higher incidence of gastro-esophageal malignancies (10). In our study, we observed a predominant site-specific involvement of anorectum and colon. These temporal developments are often linked to changes in the prevalence of underlying risk factors.

Adenocarcinoma was the most common histopathologic type in our study. This finding is similar to the studies of Bamanikar et al. and Mahajan et al. (7, 11).

Within the gastrointestinal tract, nearly 45% of carcinoids arise in the small intestine, making this the most common location for carcinoid tumors (12). However, we noted in our study the stomach preponderance with incidence of 2 out of total 3 cases.

We also observed 3 cases of malignant melanoma in the anal canal. The etiology of primary GI melanomas is unclear and speculative. One hypothesis suggests its origin from neural crest cells. Other hypotheses argues a defect in ectodermal differentiation and migration to the GIT. Tumor regression model is also implicated, suggesting GIT as a site for metastatic melanoma (13).

Higher incidence of well-differentiated malignancies was also observed in our study. This fact presents better prognostic implications.

Conclusion

Gastrointestinal malignancies were more common in the 6th decade and showed male preponderance. Predominantly affected site was the anorectal region. Overall, adenocarcinoma was the predominant type. The main strength of this study is that these results and observations provide a valuable base line information regarding frequency and pattern of GI malignancies in the region. Further studies are needed to elicit the region specific causative factors responsible for the increase in the incidence of anorectal cancer.

Acknowledgments

No Declared

Conflict of interest

There is no conflict of interest for the authors of this investigation.

Ethical statement

The study did not involve any intervention or contact with the patients, and therefore did not require informed consent or ethical approval. The data were obtained from the Indian Red Cross Cancer Institute, Nellore, Andhra Pradesh, India, with their permission.

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