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Small Intestinal Neoplasms: A 5-Year Observational Study from Central India

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Abstract

Background: Small intestinal tumors are rare and constitutes for 1-3% of all gastrointestinal tract tumors. Non –neoplastic lesions are much commoner than neoplastic lesions in small intestine. Neoplasms have not been given much consideration in the literature because of their low prevalence and non-specific symptomatology. Thus, the present study was conducted to analyze the demographic and histomorphologic characteristics of the small intestinal neoplasms.

Material & Methods: This five-year cross-sectional study was conducted at a tertiary care teaching institute in central India. A total of 27 cases were studied, which were diagnosed on resected specimens and biopsies. The demographic characteristics and gross findings were noted from case records, and a detailed microscopic examination of slides was done from departmental archives. The data was analysed and compared with previous similar studies.

Results: Small intestinal neoplasms accounted for 5.95% of total small intestinal lesions in the present study. Benign tumors (adenoma and hyperplastic polyps) were 18.5%, and malignant tumors were 81.5%. Ileum was the commonest site (59.26%) for benign as well as malignant tumors. Among 22 cases of malignant tumors, primary adenocarcinoma accounted for the majority (31.81%) of the cases, followed by non-Hodgkin lymphoma (18.18%), metastatic adenocarcinoma (13.64%), carcinoid tumour (11.11%), gastrointestinal stromal tumor (9.09%), metastatic squamous cell carcinoma (7.40%), and primary squamous cell carcinoma (3.70%).

Conclusion: Knowledge of the clinical presentation, radiologic and endoscopic findings, and histomorphologic features of various neoplastic lesions is key to the early and correct diagnosis of small intestinal tumors.

Keywords: Small intestine, Neoplastic lesion, Tubular adenoma, Adenocarcinoma, Squamous cell carcinoma.

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Introduction

Small intestine accounts for nearly 75% of gastrointestinal tract length and the constitutes more than 90% of the mucosal surface area. [1] Non-neoplastic lesions such as congenital anomalies, and inflammatory diseases are more common than neoplastic lesion. Primary carcinomas of the small intestine are rare neoplasm and constitutes only 0.1-1.3% of all gastrointestinal tract neoplasms. [2,3] The duodenum is the commonest site. accounting for more than half of all small intestinal carcinomas. [4] The most common subtypes are adenocarcinomas and neuroendocrine tumors (NETs), accounting for approximately 40% of small bowel tumors. [5] Small intestinal neoplasms have not been given much consideration in the literature because of their low prevalence and similar manifestations with nonneoplastic inflammatory lesions.

Thus, the present study was conducted to analyze the demographic and histomorphologic characteristics of the small intestinal neoplasms.

Material and Methods:

This cross-sectional observation study was conducted in pathology department of

tertiary care teaching institute of central India and included all neoplastic lesions of small intestine (surgical specimens and biopsy) received and diagnosed during study period of five years (2012-2016). Ethical approval was obtained from institutional ethical committee. Autolyzed specimens and tiny inadequate biopsies were excluded. A detailed information including age, gender, clinical signs and symptoms, endoscopic and radiological findings were recorded from the case records. Slides and paraffin blocks were retrieved from surgical pathology department and studied. Additional sections were cut to prepare fresh slides wherever required, stained and studied. Data was analyzed and compared with previous similar studies.

Results

A total of 27 cases (5.95%) of small intestinal neoplasm out of total 454 cases of small intestinal lesions were retrieved from records and studied. Benign lesions were much less common than malignant lesions (Table 1). Distribution of neoplastic lesions was depicted in table-1.

Neoplastic lesion	No. of cases	Percentage
	(n)	(%)
Benign	05	18.5%
Tubular adenoma	03	11.11%
Hyperplastic polyp	02	7.41%
Malignant	22	81.5%
Primary Adenocarcinoma	07	25.92%
Non-Hodgkin lymphoma (NHL)	04	14.81%
NETs	03	11.11%
Metastatic Adenocarcinoma	03	11.11%
Metastatic Squamous cell carcinoma	02	7.41%
Gastrointestinal Stromal Tumor	02	7.41%
Primary Squamous cell carcinoma	01	3.70%
Total	27	100%

 Table 1: Distribution of Small intestinal Neoplasms

Among benign lesions, tubular adenoma was the commonest neoplasm. In malignant lesions of small intestine, primary adenocarcinoma was most common (31.81 % of total malignant lesions), followed by lymphoma (18.18%) and then NET

(carcinoid)	(13.64%).	All	neoplastic	lesion
were more	common in	ileu	um (59.26%	b) than

duodenum and jejunum (Table 2).

Anatomical site	Benign neoplasm	Malignant neoplasm	Total
	Ν	Ν	n (%)
Duodenum	02	05	07 (25.92%)
Jejunum	0	04	04 (14.81%)
Ileum	03	13	16 (59.26%)
Total	05	22	27 (100%)

Table 2: Anatomic	distribution	of small	intestinal	neonlasms
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The mean age of presentation of benign lesions was 45.8 years with age range of 32 to 60 years and M:F ratio was 3:2. Malignant lesions were more common after 3^{rd} decade and constituting more than 70% of cases (Table 3). However, the age range was 6 years to 74 years with a mean of 41.04 years and M:F ratio was of 1:1.8.

Age (Years)	Malignant neoplasms		Total	Percentage	
	Μ	F	Ν	%	
<10	0	3	3	13.64	
11-20	1	0	1	4.55	
21-30	0	2	2	9.09	
31-40	3	1	4	18.18	
41-50	1	3	4	18.18	
51-60	1	3	4	18.18	
61-70	1	1	2	9.09	
>70	1	1	2	9.09	
Total	8	14	22	100	

Table 3: Age and	gender- wise	distribution	of malignant	small intestina	l neoplasms
8	0				1

Among clinical presentation, weight loss (81.2%) was the most common symptom in malignant neoplasms, followed by mass in abdomen (68.2%) and abdominal pain (63.6%). However, most of the (60%) benign lesions diagnosed incidentally.

Adenocarcinomas: In the present study, out of total 7 cases of primary adenocarcinomas, 4 cases were histologically moderately differentiated (Grade II) (figure 1) and 3 cases were well differentiated (Grade I). Among 3 cases of metastatic adenocarcinoma, 2 cases (66.66%) were reported in ileum and 1 case (33.33%) in duodenum. All three cases were reported in females with age ranged from 48 years to 72 years (mean age 56.67 years) and presented with abdominal pain, weight loss and anemia.



Figure 1: Adenocarcinoma : neoplastic glands infiltrating the muscularis layer ((H&E, 40x). In inset: Tumor cells have hyperchromatic nuclei and loss of

Non Hodgkin lymphoma (NHL): A total of three cases observed in ileum and one case in jejunum. Microscopy showed diffuse infiltration of lamina propria and submucosa by small to medium sized malignant lymphoid cells in all cases (figure 2). Immunohistochemistry (IHC) report was not available.



Figure 2: NHL: Diffuse infiltration of neoplastic lymphoid cells in ileal mucosa and submucosa (H&E, 40x). In inset: sheets of non-cleaved lymphoid cells with round vesicular nuclei & prominent nucleoli. (H&E, 100x)

NETs: Histologically, all cases were classical carcinoids, the cells were arranged in trabecular and insular patterns with nuclei having 'salt and pepper' chromatin (figure 3).Two out of three cases of

carcinoid tumor were positive for neuroendocrine marker (chromogranin, synaptophysin, neuron specific enolase, and CD56). In one case, IHC was not performed.

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Figure 3: Carcinoid tumor : Duodenal mucosa showing tumor cells arranged in diffuse sheet pattern having salt and paper chromatin in nucleus. (H&E, 40x)

Gastrointestinal stromal tumor (GIST): Two cases of GIST were reported, one in 40 years old male and another in 56 years old female, both involved jejunum. Histologically, both cases of GIST were of classical myentric type with spindle cells arranged in bundles and fascicles in different planes. Mitotic figures in both cases were <5 per 50 high power fields and histological malignant risk was intermediate. Both cases were

immunohistochemically positive for c-KIT and CD34.

Squamous cell carcinoma (SCC): In the present study, a rare case of primary SCC carcinoma was reported in ileum of 59 years old female, who presented with pain in abdomen, weight loss, diarrhea and anemia and two cases of metastatic SCC (figure 4) were reported in ileum, one in 61 years old female and other in 72 years old male. Both presented with weight loss and pain in abdomen



Figure 4: Metastatic SCC: lobules of atypical squamous epithelial cells in ileal submucosa. (H&E, 40x)

Discussion

The present study reported 5.95% neoplastic lesions out of a total 454 cases of small intestinal lesions. This finding was in accordance with Nanavati et al.[6] and Kulkarni et al.[7], who observed neoplastic lesions in the small intestine at frequencies of 5.48% and 2.98%, respectively. A study by Terada et al.[8] also reported only 3% cases of malignant tumours among a total of 1,312 small intestinal specimens during the 10-year study period. However, Chennakeshaviah et al.[9] reported a much higher incidence of small intestinal neoplastic lesions (42.75%) in their study of a total of 124 small intestinal specimens. This variation may be due to several factors, such as: (1) they have included only resected specimens and not biopsies in their study; (2) they have excluded pediatric age group cases; and (3) regional differences may have played a role as their study was from south India.

In the current study, malignant neoplasms outnumbered the benign neoplasms (81.5% vs. 18.5%). A similar finding was observed by Chennakeshaviah et al.[9], who reported a frequency of 15.09% of benign lesions compared to 84.91% of malignant lesions.

Ileum was the most common site (59.26%) involved in small intestinal malignancies in the present study, which is in concordance with the study done by Chennakeshaviah et al.[9] (42.45%), and duodenum was the second most common site, followed by jejunum. Many previous [10-12] studies reported the duodenum as the commonest site for small bowel tumours, followed by the ileum and then the jejunum.

In the present study, weight loss (81.2%) was the most common symptom seen, followed by mass in the abdomen (68.2%)

and abdominal (63.6%). pain Chennakeshaviah et al.[9] and Farhat et al.[13] reported abdominal pain (70.16% and 66.7%, respectively) as the most common symptom of small intestinal malignancy in their study, whereas Cardoso et al.[12] reported anemia (32.1%) as the most common symptom. Thus, we can conclude that because of nonspecific clinical features and wide variation in presentation, histopathological study is a must for confirmation of small intestinal malignancies.

Adenomas (60%) and hyperplastic polyps (40%) were the benign neoplasm in the index study, similar to the previous literature. [9,11,14]

malignant Among neoplasms, adenocarcinoma was the commonest subtype, accounting for 31.81% of cases, followed by NHL (18.18%). The finding was in line with Jhajj et al.,[11] who reported 46.2% adenocarcinomas and 23.1% lymphomas in their study. Egberts et al.,[10] in their study on 43 cases of small bowel cancer over a period of 12 years, found adenocarcinoma in 37.2% of cases, NETs in 27.9%, GIST in 23.3%, and lymphomas in 7% of cases. Cardoso et al.,[12] in their study on 28 cases of malignant small bowl tumors, found 39.28% cases of adenocarcinomas and 21.43% cases of sarcoma and lymphoma each. Similar to the present study Terada et al.[8] reported 3 cases of primary SCC out of 41 cases of small intestinal malignancies in their study.

Over 70% of small intestinal malignancies were seen in people over the age of 30 years with a mean age at diagnosis of 41 years, which is in agreement with previous studies.[10-12] The present study showed a 1:1.8 male-to-female ratio with female dominance, which was in agreement with Cardoso et al.[12] and Kam et al. [15], who reported female preponderance with a M:F ratio of 1:1.5 and 1:1.16, respectively. However, some studies [8,11] showed male predominance. Thus, we can say that small bowel malignancy can affect both genders without any predilection and this difference may be due to geographical variation.

In the present study, histologically 4 cases (18.18%) were moderately differentiated and 3 cases (13.64%)were well differentiated adenocarcinomas. Many studies also found moderately differentiated adenocarcinoma as the commonest subtype.[8-9,16]

Conclusions

Similar to the other organs small intestine also exhibits a variety of lesions such as congenital anomalies, inflammatory lesions, obstructive lesions and neoplasms. Neoplastic lesions in small intestine are much less common than non-neoplastic lesions. Because of similar manifestations, neoplastic lesions diagnosed in later stages and have poor prognosis. Thus, knowledge of the clinical manifestations, radiological findings, and wide-spectrum morphologic features of neoplastic lesions in the small intestine helps pathologists make the correct diagnosis.

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