



HISTOPATHOLOGICAL STUDY OF GASTROINTESTINAL TRACT TUMOURS IN COVID- 19 PANDEMIC

Pathology

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ABSTRACT

Background: The gut is continuously exposed to toxins and infectious organisms, yet it is often capable of eliminating these agents without causing any harm to itself. Not surprisingly, breakdown in these defense processes often results in disease. **Objective:** This study is aimed at determining age, sex and relative frequencies of various gastrointestinal tumours in tertiary care centre. **Methods:** This prospective observational study was conducted in the samples received in pathology department of IPD patients, Government Medical College in the duration of COVID-19 pandemic period of Nov 2019 to Oct 2021 [2 years]. **Results:** The occurrence of gastrointestinal tumours is highest in the colon and rectum followed by stomach and esophagus. Adenocarcinomas are common all over the gastrointestinal tract and accounted for 68.75% of cases. Majority are poorly differentiated. Mucinous adenocarcinoma is the commonest histological type in the overall tract. In the small intestine only one malignant case is reported suggesting rarity of the malignancy in the small intestine in the present study. There is a case of GIST of small intestine which is a benign tumour in present study. There is only one case with secondaries from ovarian carcinoma. **Conclusions:** This study gives an overview of the different gastrointestinal specimens received in the surgical pathology department in our institute in COVID-19 pandemic and analyses the varied histomorphological diagnosis of gastrointestinal lesions

KEYWORDS

Histopathological, Gastrointestinal Tract, Tumours

INTRODUCTION

Today, gastrointestinal pathology is accepted as one of the largest subspecialties within general histopathology. Gastroenterology is a rapidly developing and expanding branch of medicine, and histopathology plays an important role in the diagnosis and treatment, no less than in research. However the primary aim of examining pathology specimens is to provide essential diagnostic and prognostic information allowing physicians and surgeons the best clinical management of the individual patient.¹

The definitive diagnosis of gastrointestinal disorders rests on the histopathological confirmation and it is one of the bases for planning proper treatment. Biopsies are also taken to determine and to detect cancers or their pre malignant stages.²

The neoplastic lesions of the Gastrointestinal Tract vary in different segments from oesophagus to anus. Histopathological changes in various neoplastic lesions of the gastrointestinal tract helps in proper diagnosis and deciding the mode of treatment to be offered to the patient. Gastrointestinal tumours account for a large proportion of all neoplasms.³ Colorectal cancer ranks second and stomach cancer ranks fourth among the most common tumours of the world, according to the World Cancer Report of 2000.⁴ Curiously the small intestine is an uncommon site for tumour despite its great length and vast pool of dividing cells. There is world wide variation in the distribution of these neoplasm, which appear largely due to exogenous factors rather than genetic.⁵ The tumours of the Gastrointestinal tract pose a major problem in oncology and also are a major cause of apprehension in patient with the abdominal complaint in whom the fear of the cancer is the greatest. The gastrointestinal system has been reported the second common site for the non-cutaneous cancer and second reason of the mortality resulted from cancer.⁶ The pattern and distribution of gastrointestinal malignancies differ in different geographical areas, carcinoma esophagus being most frequent in Iran, carcinoma stomach in eastern Asian countries and colorectal carcinomas in developed world.⁷ The geographic difference depends on the food, environment and genetic predisposition. People having low fiber intake in diet have high incidence of colorectal carcinomas whereas those consuming hot beverages have high incidence of esophagus carcinoma. Young people have less GI neoplasms as the dose and time of exposure of carcinogenic agent is less.⁸

Gastrointestinal tract tumours are the most common pathology seen in routine clinical practice. These include a varied group of disorders

which are broadly classified based on symptoms as those of upper gastrointestinal disorders and lower gastrointestinal disorders.⁹ All over the world, GI tract malignancies form a significant proportion of malignant tumours in both sexes.¹⁰

This study is aimed at determining age, sex and relative frequencies of various gastrointestinal tumours in tertiary care centre.

MATERIALS AND METHODS:

This prospective observational study was conducted in the samples received in pathology department of IPD patients, Government Medical College in the duration of COVID-19 pandemic period of Nov 2019 to Oct 2021[2 years]. The Study was conducted after obtaining ethical clearance from institutional ethical committee and consent from the patients.

Sample Size:

We could get a sum total of 35 samples in the duration of 24 months because the routine OPD was closed for about 12-14 months and so is the case of Routine operative procedures

Inclusion criteria:

In this study the materials were collected in the form of (A) biopsy and (B) resected specimens of gastrointestinal tract along with supportive investigations according to the proforma attached here with. This is correlated with gross and histopathological examination of respective surgical specimen. For histopathological study paraffin embedded sections will be stained by Hematoxylin and Eosin stain. Special staining and immunohistochemistry was done wherever necessary.

All gastrointestinal tract malignancies were classified according to WHO classification of gastrointestinal tumours (2019).

Exclusion criteria: Specimens other than Gastro-intestinal tract tumours.

Histopathological Procedure:

- After studying clinical profile of the patient as per the proforma attached herewith. Surgical specimens will be obtained in 10% formalin as a fixative. After fixation, gross examination will done which includes size, shape, colour, consistency and cut surface. The most representative areas of each case will be found and sections of size 1.5 x 1 will be taken.

- A tissue cassette along with unique number given in the gross room to the tissue sample will be carried throughout
- Laboratory procedures: Tissue processing have twelve separate stages, completes the cycle in about eighteen hours, scheduled as under: 10% formalin for fixation
- Ascending grades of alcohol (75%, 95% through 100%) for dehydration for about 5 hours in 6-7 jars.
- Xylene for clearing for 3 hours in 2 jars
- Paraffin impregnation for 6 hours in two thermostat fitted Wax baths
- Tissue sections of 4-5 μ m thickness were cut and stained by hematoxylin and eosin stain.
- Special stains and Immunohistochemistry will be used whenever found necessary.

All procedure performed in current study were approved by institutional ethical committee (IEC) S.R.T.R.G.M.C/Pharma/IEC/DHR 23 dated 01/10/2019). The study was conducted after approval of ethical committee and a written informed consent was obtained from all individual participants included in the study.

RESULTS:

It was observed that, out of 1040 neoplasms of all sites, 35 cases were of gastrointestinal neoplasms, thus constituting 3.36 % of all neoplasm lesions during the study period.

Table No. 1: Site wise distribution of GIT benign neoplasms:

Site	No. of cases	Percentage[%]
Small Intestine	02	25
Large intestine	02	25
Rectum	03	37.5
Anal Canal	01	15.5
Total	08	100

Amongst the benign lesions, rectum [37.5.0%] was the most commonly involved site followed equally by large intestine [25.0%] and small intestine [25.0%].

Table No. 2: Age wise distribution of GIT benign neoplasms:

Age (in years)	Small Intestine	Large Intestine	Rectum	Anal canal	Total
0-10	0	0	0	0	0
10-20	0	1	1	0	2
30-40	1	0	0	0	1
40-50	1	2	0	0	3
50-60	0	0	0	1	1
60-70	0	0	1	0	1
Total	2	3	2	1	8

Table 3: Histopathological diagnosis of benign neoplasms:

Histopathological diagnosis	No. of cases	Percentage (%)
Juvenile polyp	05	62.5
Gastrointestinal stromal tumour	02	25
Adenoma	01	12.5
Total	08	100

In the present study, there were 8 cases (22.85%) of benign tumour of gastrointestinal tract.

Colorectal cancers showed highest frequency (60.0%) amongst gastrointestinal malignancies followed by cancer of oesophagus, stomach and anal canal (18.5). Of all colorectal cancers, there were 56.5% cancer of rectum and anal canal and remaining 43.7% of colon cancer.

Table No. 4: Age wise distribution of GIT malignancies.

Age (Yrs)	Oesophagus	Stomach	Small Intestine	Large Intestine	Rectum	Anal Canal	Total
1-10	0	0	0	0	0	0	0
10-20	0	0	0	0	0	0	0
20-30	0	0	0	1	0	0	1
30-40	0	0	0	1	2	1	4
40-50	0	2	1	1	2	0	6
50-60	2	2	0	2	1	2	9
60-70	1	1	0	2	0	0	4

70-80	1	0	0	0	0	0	1
90-100	1	0	0	0	0	1	2
100-110	0	0	0	0	0	0	0
Total	5	5	1	7	5	4	27

Amongst a total of 27 cases of gastrointestinal malignancies, more than half of all cases were seen in 50-70 years of age with highest frequency within 50-60 years of age (33.33%). The youngest case was 29 years old and oldest case was 100 years.

Cancer of esophagus, stomach, colon, rectum and anal canal also peaked in the 51-60 years age group.

Out of 27 patients of gastrointestinal tract malignant tumours, males were 16 and female were 11. The male female ratio was 1.45:1.

cancer of Esophagus:

In the present study, cancer of Esophagus most commonly involved middle third (60.0%) followed by lower third (40.0%) and NO case in upper third of Esophagus respectively.

Table No.5: Gross features of cancer of Esophagus:

Gross Features	No. of cases	Percentage (%)
Fungating	01	20
Ulcerative	01	20
Infiltrating	03	60
Polypoid	00	00
Total	5	100

Infiltrating type was commonest amongst all cases of cancer of Esophagus on gross examination.

Squamous cell carcinoma was commonest microscopic type accounting for 60.0% of all cases. Other type was adenocarcinoma (40%) cases. Moderately differentiated squamous cell carcinoma was commonest type of squamous cell carcinoma.

Cancer Of Stomach:

In the present study, pylorus was most commonly affected site in stomach cancer and whole stomach was least commonly involved.

Infiltrating type of gastric carcinoma was the most common (66.66%) gross type in the present study.

Tubular adenocarcinoma was the commonest microscopic type accounting for 60% of all gastric cancer followed by signet ring cell carcinoma in the present study.

Cancer Of Small Intestine

The number of cases of small intestine malignancies in present study was too small i.e only 1 case, to draw any conclusion except that malignant lesions of the small intestine were rare in occurrence.

Left sided malignancies (09) had higher frequency than right sided malignancies (07) in the present study. Cancer of rectum (20%) was commonest amongst all colorectal cancer.

In the present study of colorectal cancers, exophytic growths (56.25%) were seen in more than half of all cases and least common was polypoid type of growths.

Adenocarcinoma constituted most of colorectal cancer [68.75%] in the present study. Amongst all adenocarcinomas, tubular adenocarcinoma was commonest type (31.25%) observed.

Metastatic Spread To Gastrointestinal Tract:

Out of total 27 malignant lesions of gastrointestinal tract, there is only one case i.e of ovarian carcinoma metastasizing to colon (Fig 3) (3.70%).

DISCUSSION:

A total of 35 cases of gastrointestinal tract tumours were studied over a period of two years of COVID-19 pandemic from November 2019 to October 2021. Amongst 35 cases, there were 08 cases of benign and 27 cases of gastrointestinal tract malignancy.

Amongst all neoplasms, benign accounts for 22.85 %. In the present study, out of total 8 cases only single case has been diagnosed as

adenoma accounting for 12.5% of all benign lesions. Adenoma in present study is seen in the age group of 60-70 years with male affection and these findings are consistent with observations made by Rickert R. et al (1979)¹¹

Juvenile polyp (50.0%) is the commonest of all benign lesions in present study. The age of occurrence of 0-20 years has correlated well with the study made by Goodman et al (1979)¹²

The presence of isolated juvenile polyp in the colorectum is relatively common; up to 2 % of children who are less than 10 years of age have an isolated juvenile polyp¹³ which in our case is 25% under 10 years of age. According to WHO criteria, tubulovillous adenomas are encountered less frequently (8-16%)¹⁴ which is comparable to our study (12.5%). GISTs (Fig 1,2) can originate anywhere in the GI tract. The stomach (40–60%) and small intestine (30–40%) are the most common locations however in our case we found only 2 cases (25%) of GIST in small intestine.¹⁵

Malignant lesions of gastrointestinal tract:

A total of 35 cases of gastrointestinal tract neoplasms were studied amongst a total of 1040 cases of neoplastic lesions of all sites. Of 35 cases of gastrointestinal tract neoplasms 27 cases were malignant.

Cancer of the gastrointestinal tract has become a worldwide disease. The incidence of gastrointestinal tract malignancies varies from country to country and also in different parts of the same country. Rural population has less awareness and come on appearance of symptoms only. We received 20 resected and 07 biopsy specimens of malignant tumours of which biopsied patients were referred to higher centre

Relative frequency of GIT malignancies in the present study (5.86 %) is comparable with the results of study conducted by Prabhakar et al.¹⁶

In the present study, GIT malignancies showed slight male preponderance (M: F=1.45:1). Sex ratio in the present study was comparable to that seen in all the above studies.

Sex factor usually plays very important role in GIT malignancies which could be explained by changing life styles, dietary habits, increased literacy rates, increasing awareness about health problems, earlier seeking of medical advice, availability of modern diagnostic facilities and increased life expectancy.

In the present study, colorectal cancer has highest frequency of occurrence and least commonly involved was small intestine which is comparable to different studies.^{17,18}

Present study showed M: F ratio of 1.5:1 with male preponderance which is comparable with all the above studies. Carcinoma of the esophagus generally is considered an extremely aggressive tumour with poor prognosis.

In most of the above studies, middle third of the esophagus was the commonest site affected which is comparable to our study.

Gross Features:

Grossly, commonest type observed in the present study was infiltrating type of growth in (60.0%) cases followed by other less common type fungating (20.0%), ulcerative (20.0%) and polypoid (00.0%).

Squamous cell carcinoma of esophagus was the commonest type observed in all above studies including ours. In the present study, out of 5 esophageal cancer cases, 3 (60.0%) were squamous cell carcinoma.

Male to female ratio was 1.5:1 amongst stomach cancer cases in the present study, which was comparable to other studies of stomach cancer.¹⁹

Peak incidence of stomach cancer was seen in 40-50 and 50-60years age group in the present study. It was comparable with all studies.

From the above mentioned studies, it was seen that pylorus of the stomach was the seat of disease in a majority of cases in most of the studies. Whole stomach was the least common affected site. Site wise distribution of cancer of stomach observed in the present study was in accordance with study carried out by Chanda et al.²⁰

Chanda et al²⁰ reported ulcerative type as commonest on gross examination. Infiltrating type of lesion was commonest on gross in the present study and accounts for 60.0% of all cases.

In the present study, adenocarcinoma accounted for 60.0% of cases of cancer of stomach and 40.0% cases of signet ring cell carcinoma.

Small Intestine:

The number of cases of small intestine malignancies in present study was too small to draw any conclusion except that malignant lesions of the small intestine were rare in occurrence.

Colon, Rectum And Anal Canal:

Male preponderance was observed in the colorectal cancer patients in the present study which is comparable with all studies.

Age group in which peak incidence of colorectal cancer was observed in present study i.e. 50-60 years was comparable with Meher Homji et al.²¹

Left sided colon cancers were more commonly observed than right sided cancers in various studies. Of all colorectal cancer, cancer of rectum showed highest frequency i.e. 18.75% in the present study, which is in accordance with the studies of Meher Homji²¹ and Gangadharan (1972)²²

Gross Features:

In the present study, exophytic carcinomas were the commonest type seen [56.25%], followed by endophytic [20.0%], annular [12.50%] and polypoid [6.25%] type. Frequency of exophytic and endophytic growths matches approximately with study of Ahmad et al (2005)²³

Frequency of mucinous adenocarcinoma observed in present study was comparable with all studies except Mansoor et al (2002)¹ study.

CONCLUSION:

In our study, during COVID-19 pandemic, the occurrence of gastrointestinal tumors were highest in the colon and rectum. Malignant gastric tumours were more common than benign tumours. Gastrointestinal tumours were more common in the 6 th decade. Gastrointestinal tract lesions are detected late as patients are either asymptomatic or present with mild, non-specific symptoms in early stage of disease. Therefore, early diagnosis and treatment is beneficial for the better management and is imperative in providing better quality of life to the patient.

Thus, Histopathological diagnosis has been the gold standard for early accurate diagnosis especially malignant ones and is indispensable for the specific treatment protocols. The result of a careful and systematic examination of surgical specimens from patients with tumors of the gastrointestinal tract play an important role in patient care and the assessment of prognosis. Despite promising findings with molecular and immunohistochemical analysis, tumor stage is still regarded as the most important prognostic factor in colorectal cancer. The other stage independent prognostic factors include histologic grade, vascular invasion, perineural invasion and tumor border configuration.

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