

Original Research Article

A comprehensive study on colorectal malignancies

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ABSTRACT

Background: Colorectal cancer is one of the cancers whose incidence is increasing globally. Coupled with the relatively sophisticated and expensive management protocols, it poses a major health systems challenge.

Methods: The present study is a cross-sectional study conducted among patients admitted with colorectal carcinoma in the General Surgery wards in a tertiary care hospital. Data was collected using a pretested pre-structured interview schedule. Relevant lab and radiographic workup was done.

Results: A total of 50 subjects were studied. The study population was largely male, illiterate and in the older age groups. The lesions were mostly left-sided and located in the rectum. 10% presented with metastasis and 16% presented as acute intestinal obstruction. Most of the lesions were in the Dukes' stage C and mostly moderately differentiated. The common surgical procedures done in elective cases were curative abdomino-perineal obstruction and right hemicolectomy.

Conclusions: Being a disease associated with old age and non-vegetarian dietary habits and requiring advanced surgery as gold standard treatment, colorectal cancer is especially important in a country undergoing disease-favorable epidemiologic and demographic transitions like India.

Keywords: Colorectal-carcinoma, Dukes' staging, Neoplasms

INTRODUCTION

Colorectal cancer is currently the third most common cancer globally. Around 1.4 million new cases were reported worldwide in 2012, accounting for 10% of all new cancer cases.¹ This number increased to 1.80 million in 2018.² The number of deaths caused by colorectal cancer was 862000 in the year 2018, making it the second most common cause of cancer-related deaths.² Globally the highest estimated incidence rates are in Australia and New Zealand while the lowest rates are observed in Western Africa.³ In India, the annual incidence rates (AARs) for colon cancer and rectal cancer among men are 4.4 and 4.1 per 100000, respectively. The AAR for colon cancer among women is 3.9 per 100000. Among men, colon and rectal cancers rank 8th and 9th respectively, while ranks among women are 9th and

outside top 10. The ICMR report of 2013 notes that the highest AARs for CRCs among men was reported from Thiruvananthapuram (4.1) followed by Bengaluru (3.9) and Mumbai (3.7). AARs among women were highest in Nagaland (5.2) and Aizwal (4.5).³

Survival in colorectal cancer is dependent on the stage at diagnosis. The 5-year survival rate is 90% for those diagnosed at an earlier stage compared to the 13% for those diagnosed at a later stage. The number of cases is expected to increase by 60% over the next 15 years, making it one of the cancers whose incidence is rising.¹ It has been understood that tumours of colon and rectum can be grouped together as the pattern of genomic alterations in both tissues are observed to be similar. A set of 24 genes have been identified to be mutated in a significant number of cases. Commonly involved genes

include APC, ARID1A, TP53, KRAS, PIK3CA, SOX9, FAM123B/WTX, ERBB2 and IGF2.³

The treatment for CRC has improved dramatically over the last 250 years. Once regarded as an incurable disease, multiple modality therapies have significantly improved mortality from 100% to less than 4% for locally advanced rectal cancer.⁴ Colorectal surgery has remained the mainstay of CRC treatment. The methods used for rectal surgery have changed from the abdomino-perineal resection of Miles to Hartmann's procedure, anterior rectal resection and total mesorectal excision (TME) of Heald, the last of which remains the gold standard treatment for rectal cancer.^{5,6} Aggressive surgery to completely eliminate malignancy is gained more credence to ensure disease-free survival. Some topics that may increase post-surgical recurrence-free survival are a matter of ongoing debate such as complete mesocolic excision (CME), strategies of metastatic disease, importance of hyperthermic intraperitoneal (HIPEC), and surgical methods for treatment of recurrence.⁷

Evidence suggests that a "Westernized lifestyle" of relative physical inactivity, diet, obesity, increased alcohol consumption and long-term smoking is strongly associated with a higher incidence of CRC.⁸ As India is undergoing an epidemiological transition fueled by the same risk factors, it may be predicted that the burden of CRC will rise especially in view of the high mortality and morbidity levels. More research on patterns of epidemiology, symptomatology, etiology and treatment modalities is urgently needed to understand the natural history of the disease and future of therapy for CRC.

METHODS

The present study was conducted in the Department of General Surgery, Stanley Medical College in Chennai, Tamil Nadu. Data collection was done over a period of 12 months from January 2015 to January 2016. The inclusion criteria comprised of patients who were aged 18 and above, willing to give participate in the study and histo-pathologically confirmed cases of colo-rectal carcinoma. The exclusion criteria comprised of patients who were cases with recurrent colo-rectal carcinoma and metastasis in the colon from primary carcinoma in other organs. During that study period, a total of 50 patients presented who fit the inclusion and exclusion criteria, out of which 8 were emergencies. After explaining about the study and obtaining informed written consent, a detailed history was elicited from each patient, with special emphasis on family history, habitual history and early symptomatology. A pre-tested, semi-structured interview schedule was used for the data collection. All efforts were taken to maintain confidentiality for all the participants. If the participant was uncomfortable during any stage of the study, he/she was allowed to choose to withdraw the consent and stop being a part of the study.

The elicitation of history was followed by a thorough physical examination for evaluating the general condition and clinical signs. Digital rectal examination (DRE) was performed in all patients. A comprehensive laboratory investigation workup was done in the case of every patient. Radiographic studies were performed, except in cases of emergencies. When indicated, colonoscopic examination and computed tomography (CT) of abdomen were done.

Chest X-rays were taken for all patients for pre-operative evaluation as well as for the detection of secondaries. Liver function tests were used to assess nutritional status of the patients, as was the routine procedure. For all possible cases, preoperative biopsy was taken through proctoscopic and/or colonoscopic guidance. The histologic type of the cancer was determined before planning the treatment strategy. Detailed histopathological reports were used to stage the tumour and assess the grade differentiation.

The collected data was entered in Microsoft Excel 2013 and the master sheet was imported to Statistical Package for Social Sciences v. 22.0 for data analysis.

RESULTS

A total of 50 cases of colorectal carcinoma were studied. Out of the total, 29 (58%) were male and 21 (42%) were female. The incidence was nearly equal in rectal carcinoma with a slight preponderance towards males in the case of colonic carcinoma.

Table 1: Age and sex distribution of cases of colorectal cancer.

Age range (years)	Male	Female	Total
20-30	1	0	1
31-40	2	7	9
41-50	11	6	17
51-60	9	4	13
61-70	5	3	8
>70	1	1	2
Total	29	21	50

As is obvious from Table 1, most of the cases were in the late middle and older age groups. Maximum incidence was in the 4th and 5th decades in both males and females. The youngest patient was 21 years old.

With respect to dietary history, 5 were strict vegetarians. The majority were illiterate as so they could not specify the exact dietary composition. The given dietary history shows that fat and fiber intake were sufficiently adequate in most patients. More than 50% (27 patients) of the subjects were using tobacco in one form or another. Almost all males (excepting a single person) were regular smokers of beedis and/or cigarettes. 5 out of the 21

females were using in the form of tobacco and pan masala.

More than two-thirds (34 out of 50) of the cases presented with carcinoma on the left side. Most of the cases (62%; 31 out of 50) were cancers of the rectum. The other common sites of tumours were as follows: ascending colon (13 cases), anal canal (2), sigmoid colon (1), caecum (1), hepatic flexure (1) and splenic flexure (1). Majority of the patients had history of ignoring the early symptoms and presentation at later stages of carcinoma. 16% of the cases presented as acute intestinal obstruction in the emergency department. Diagnoses of the patients was facilitated by the later-stage right-sided lesions presenting as mass, left-sided growths presenting with mass or obstruction and most of the rectal growths being palpable on digital rectal examination.

Significantly most of the right-sided lesions had symptoms of altered bowel habits, anemia and abdominal lump while a single case presented with mucus discharge. Majority of cases presenting with bleeding per rectum were found to be suffering from cancers of the rectum and sigmoid colon. Two patients of rectal carcinoma presented with severe pain and in advanced stage. Three patients had secondaries in the liver. In total, 5 patients had metastatic and disseminated disease. Abdominal lump was a presenting symptom in the one case each of hepatic flexure growth and sigmoid colon growth.

Most of the rectosigmoid and left-sided lesions were of the annular type and ulcerated with infiltration type. One sigmoid growth showed infiltration into bladder and left ovary. A majority of the right sided growth were polypoidal or cauliflower-like.

Table 2: Staging and grading of the colorectal cancer cases.

Staging of the cancers	Number of cases	Proportion of cases (%)
Duke's stage A	1	2
Duke's stage B	9	18
Duke's stage C	31	62
Duke's stage D	9	18
Grading of the cancers		
Well-differentiated	12	24
Moderately-differentiated	34	68
Poorly-differentiated	4	8

The staging of the cases as assessed by Duke's staging is provided in Table 2. As shown in the table, most cases belong to Duke's stage 3 and are well differentiated.

In all patients, surgical resection was attempted with the aim of either cure, palliation or palliative

bypass/colostomy. The various surgical procedures performed are tabulated in Table 3.

Table 3: Types of surgical procedures performed.

Name of procedure	Emergency (n=8)	Elective (n=42)
Hartmann's procedure + temporary colostomy	5	1
Re-anastomosis (stapler technique)	2	0
Curative abdomino-perineal resection	0	18
Anterior resection with colono-anal anastomosis	0	9
Right hemicolectomy	0	13
Left hemicolectomy	0	3
Right extended hemicolectomy	0	2

One emergency case expired while 2 did not turn up for follow-up. Most of the cases were advised to undergo adjuvant chemotherapy with 5-fluorouracil and calcium folinate. A minimum of 6 cycles were given, with an additional 4 cycles for patients showing only partial response. Radiotherapy was pre-operatively administered to one patient who underwent Hartmann's procedure.

A total of 30% of the patients did not adhere to follow-up instructions. Two patients had recurrence – one in whom the site was the abdominal wound and expired and the second in whom the site was the anastomotic site for which subtotal colectomy was done. Three patients had local recurrence after APR surgery. 25 patients had regular follow-up along with normal repeat USG, colonoscopy and basic investigations.

DISCUSSION

In the present study, the male:female ratio of colorectal cases was around 1.4:1. This finding was in line with the male:female ratio determined in other studies.⁹⁻¹¹ The age of the patients was predominantly in the 40-60 years age group. This suggests that in the present study, CRC occurs in relatively younger individuals compared to studies which show the mean age of diagnosis to be above 60 years.^{10,12} Some studies such as Javid et al partially concur with the findings of the present study.¹¹

The study population under consideration was composed of 10% strict vegetarians. This suggests the protective influence of vegetarian diet against colorectal cancer as has been demonstrated by various studies.¹³⁻¹⁸ Similarly tobacco use was very common (especially among male patients), hinting at the effect of tobacco, as was observed in previous studies.¹⁹

The finding of most cancerous lesion on the left side in the present study was in concurrence with Goh et al and

Mik et al.^{10,20} The common sites of lesion within the gastro-intestinal tract were the rectum (62%) and ascending colon (26%). The proportion of the documented CRC cases occurring the rectum is much higher compared to previous studies, which observed the proportion to be between 25% and 47%. The finding was however consistent with Peedikayil et al.^{9,11,12}

The common symptoms encountered among the subjects were altered bowel habits, abdominal palpable lump, abnormal digital rectal examination, anemia and intestinal obstruction. Similar findings were expressed by studies such as Sinha et al, Hamilton et al and Ben-Ishay et al.²¹⁻²³ The major difference is the relatively higher proportion of patients presenting with acute abdominal obstruction. Metastasis was present in 10% of cases, in line with Sinha et al.²¹

Histological grading of the carcinomatous cells showed that most of the patients were in the grade II or moderately differentiated category. Similar findings have been previously reported in Akkoca et al and Sinha et al.^{21,24} Studies such as Badmos et al show a different pattern, with the well-differentiated category dominant.²⁵ As in previous studies, most of the cases presented with cancer in the second and third stages.^{21,25}

CONCLUSION

Colorectal cancer will continue to pose a major challenge to the healthcare system in India because of the possibility of dramatic rise due to epidemiological transition and the relative lack of the sophisticated and expensive treatment modalities typically used to treat the condition. More research into how the emerging risk factors in India such as a changing diet are affecting the epidemiology of the disease need to be rigorously conducted.

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