International Journal of Research in Medical Sciences
Devi AS et al. Int J Res Med Sci. 2026 Jun;14(6):2500-2504
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20261694

Original Research Article

Clinicopathological profile and survival outcome of colorectal cancer: a retrospective study from a tertiary care centre in North-East India

Akoijam S. Devi[1], L. Purnima Devi[1], Neeta Sinam[2]*, Y. Sobita Devi[1], Ngairangbam P. Singh[1], Dangtila Sangtam[1], Alex Rajkumar[1]

[1]Department of Radiation Oncology, Regional Institute of Medical Sciences, Imphal West, Manipur, India
[2]Department of Radiation Oncology, JNIMS, Imphal East, Manipur, India

Received: 30 March 2026
Revised: 02 May 2026
Accepted: 05 May 2026

***Correspondence:**
Dr. Neeta Sinam,
E-mail: neetasinam828@gmail.com

ABSTRACT

Background: Colorectal cancer (CRC) is an emerging major health issue. The incidence in North-Eastern part of the country is higher compared to rest of the country. However, there is no formal screening program inspite of the alarming increased incidence. This study aims to analyze the clinicopathological characteristics, treatment pattern and outcome of CRC patients in a tertiary care hospital in North-East India.
Methods: A retrospective review was conducted for all patients with histopathologically confirmed CRC reported to Radiation Oncology Department, RIMS Imphal between January 2019 and December 2023. Data regarding demographic parameters, clinical presentations, tumor characteristics, treatment modalities and survival were collected and analyzed.
Results: A total of 212 cases with M:F ratio of 1.32:1 were studied. The mean age was 56.9 years with most commonly affected age group being 51-60 years. The most frequent symptoms were pain abdomen (37.01%), bleeding per rectum (34.41%), altered bowel habits (22.07%) and loss of appetite (6.49%). Rectum was most commonly affected (52.04%) followed by colon (33.67%) and rectosigmoid (14.28%). Adenocarcinoma was predominant (84.90%) followed by signet ring cell (7.07%), mucinous (7.07%) and squamous cell carcinoma (0.94%) with majority showing moderate differentiation (74.49%). Most patients were diagnosed at stage III (37.75%) followed by stage IV (27.55%). 2 years overall survival was 25.75%.
Conclusion: Colorectal cancer has male dominance and predominantly presents in advanced stages. The survival outcome is poor with limited curative option. These findings highlight the need for screening and public awareness.

Keywords: Colorectal cancer, North-East India, Clinicopathological profile, Retrospective study

INTRODUCTION

Colorectal cancer (CRC) has emerged as a significant global health concern, with increasing incidence and mortality rates in both developed and developing nations. It encompasses malignancies arising from the colon and rectum. According to the Global Cancer Observatory (GLOBOCAN 2022), CRC ranks among the top three most commonly diagnosed cancers accounting for 1.9 million new cases and 8,81,984 deaths globally. India recorded 64,000 new cases with overall incidence rate 4.5 per 100,000 population and is responsible for a substantial proportion of cancer deaths annually.[1] It is the fourth most common cancer for both sexes combined, with higher incidence and mortality in males.

According to a data compiled under NCRP by ICMR from published reports of 27 Indian PBCR, age adjusted rate (AAR) for colon and rectal cancer was highest in North Eastern states compared to rest of the states in the country.

AAR in males and female for colon cancer was highest in Northeast region with 5.36 and 4.34 respectively followed by South region with 4.15 and 3.08 respectively. Similarly for rectal cancer also highest AAR in male and female was also recorded in Northeast region with 7.3 and 4.22 compared to South region with 5.17 and 3.65 respectively.[2]

As per the cancer registry maintained at our center, Department of Radiation oncology RIMS, Imphal colorectal cancer accounts for an average of 5.70% of the total 6179 cases registered in 5 years.

Historically, CRC incidence in India has been lower compared to Western countries; however, recent trends indicate a gradual increase particularly in urban and semi-urban regions more so in young age group.[3,4]

Risk factors include consumption of red meat and processed meat, smoking, alcohol consumption, decreased dietary fibres, obesity, sedentary life style, inflammatory bowel disease (IBD) and family history of colorectal cancers.[5-14] North East India exhibits unique dietary patterns, including high consumption of smoked meats, fermented foods, and spicy diets, along with varying levels of access to healthcare services. These factors may influence not only the incidence of colorectal cancer but also its clinical presentation and pathological characteristics.

In clinical practice, understanding the demographic and pathological profile of colorectal cancer is essential for early detection, timely intervention, and improved prognosis. Factors such as age at presentation, gender distribution, symptom duration, tumor location, histological subtype, and stage at diagnosis are crucial for planning effective management strategies. Moreover, knowledge of regional patterns can aid public health initiatives and resource allocation, especially in areas where diagnostic and treatment facilities are limited.

National programme for prevention and control of cancer, diabetes, cardiovascular diseases and stroke (NPCDCS) is undertaking nation-wide screening for breast, oral and cervical cancer. However, no such formal screening has been reported so far for colorectal cancer despite alarming increase in incidence.

This study is undertaken with the objective of evaluating the clinicopathological profile of patients diagnosed with colorectal cancer at a tertiary care centre in North East India to provide a clearer understanding of the disease characteristics in this specific geographic and cultural context.

The findings are expected to contribute to the limited body of literature from this region and potentially help in framing screening protocols tailored the local population and also in increasing the awareness of the general public regarding the burden of the disease.

METHODS

This hospital-based, retrospective observational study was conducted at the Department of Radiation Oncology, Regional Institute of Medical Sciences, Imphal. A total of 441 patient records for that patient with histologically confirmed CRC reported to Department of Radiation Oncology, RIMS in a period of five years i.e. January 2019 to December 2023 were screened. Those with complete medical record and with a minimum follow up of 2 years were included in our study. Patients with incomplete or missing data and those lost to follow up were excluded from the study.

Out of the total 441 screened only 212 patients were included in analysis. Patient records were reviewed for demographic details (age, sex), family history, alcohol and smoking history, presenting symptoms, tumor location, histological type, tumor grade and clinical stage at diagnosis (AJCC 8th edition TNM staging system). Response was assessed based on the records of the imaging studies as per the RECIST criteria. And for those patients whose follow up records were missing telephonic contacts were done to know the survival status of the patient and patients surviving at least 2 years from date of registration were counted.

Statistical analysis

Data were compiled using Microsoft Excel. Data will be analyze using mean and median for quantitative variables and frequency and percentage for qualitative variables.

RESULTS

Colorectal carcinoma was divided into colon, rectal and rectosigmoid. In our study we found that the commonest age group affected was 51-60 years. Mean age at presentation is 56.9 years with minimum age at presentation being 24 years and maximum age being 87 years (Figure 1).

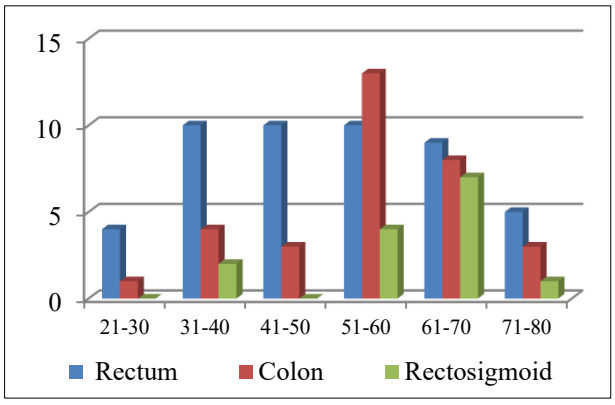

Figure 1: Age distribution of colorectal carcinoma.

Table 1 shows that out of the total 212 patients, 121 were males (57.14%) and 91females (42.86%) with M:F ratio of

1.32:1. Fifty patients (23.58%) had smoking history, 23.11% were alcoholic and 8.02% had family history. The most common presenting complaints were altered bowel habits reported in 132 patients (62.26%). Rectal bleeding, abdominal discomfort, unexplained weight loss and palpable abdominal lump were present in 105 patients (49.53%), 88 patients (41.51%), 83 patients (39.15%) and 30 patients (14.15 %) respectively.

Table 1: Gender distribution of various subsites of colorectal cancer.

Sex	Rectum	Colon	Rectosigmoid	Total
Male	56	41	24	121
Female	54	30	7	91
Total	110	71	31	212

Adenocarcinoma (conventional type) was the commonest histopathology comprising of 84.90% of the total case. Out of which most common were moderately differentiated accounting for 157 cases (74.05%) followed by poorly differentiated and well differentiated comprising of 34 cases (16.04%) and 21 cases (9.90%) respectively. Other histopathological types were mucinous adenocarcinoma, Signet ring cell carcinoma and Squamous cell carcinoma accounting for 15 cases (7.07%), 15 cases (7.07%) and 2 case (0.94%) respectively (Figure 2).

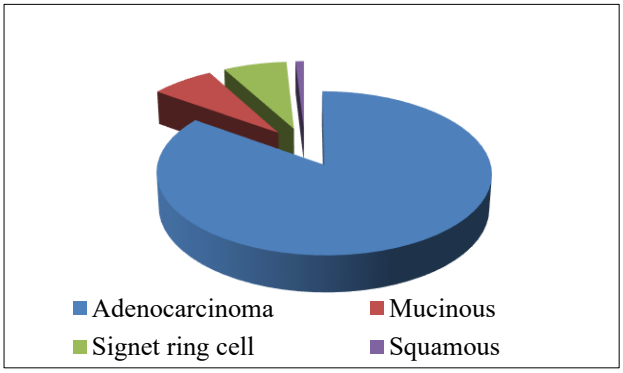

Figure 2: Histopathological types of colorectal carcinoma.

Table 2 shows that maximum number of patients presented with stage III disease followed by stage IV contributing a total of 41.98% and 30.66% respectively. Liver was the most common site of metastasis accounting for 76.74% followed by lung in 16.28%, peritoneum in 4.65% and distant lymph nodes in 2.32%. A total of 118 patients (55.66%) presented with serum CEA above 5 ng/ml.

Table 2: Stage wise distribution at presentation.

Stage	Rectum	Colon	Rectosigmoid	Total
I	7	5	0	12
II	22	17	7	46
III	41	29	19	89
IV	36	24	5	65

Among the total 212 cases, only 139 cases (65.57%) were treated with curative intent and 70 cases (33.02%) received palliative treatment and 3 cases (1.41%) didn't receive any form of treatment. Out of 139 patients planned for curative treatment 3 patients defaulted. In carcinoma rectum, curative treatment consisted of surgery followed by adjuvant treatment (chemotherapy or chemoradiation) or neoadjuvant treatment (chemotherapy or chemoradiation) followed by surgery or definitive chemoradiation in unresectable cases. In cases of carcinoma colon treatment consisted of surgery with or without adjuvant chemotherapy in resectable cases and neoadjuvant chemotherapy followed by surgery in borderline resectable cases.

A total of 81 patients received neoadjuvant chemotherapy. Most commonly administered first line chemotherapy regime was FOLFOX 4 received by 60.49% of cases followed by CAPOX and single agent capecitabine or S1 in 29.63% and 12.34% respectively. 3 patients defaulted treatment. After 6 months course of chemotherapy, partial response was seen in 44 patients (56.41%), stable disease in 23 patients (29.49%) and disease progression in 10 patients (12.82%) and only 1 patient (1.28%) had complete response. 2-year survival was only 25.75%

DISCUSSION

CRC constitutes a considerable burden to the population. Despite advances in screening and diagnostic tools and treatment available, it continues to contribute to significant mortality. This can be to limited awareness and assess of the general population to screening tools and presentation at advanced stage. In low-income countries like India, colorectal carcinoma is usually misdiagnosed and treated as hemorrhoids at primary health care set up as these centers usually lack diagnostic tools. This study highlights the clinicopathological landscape of colorectal carcinoma in a region where comprehensive cancer surveillance is still developing.

The mean age (years) of the patients was 56.9 years with most patient lying in age group 51-60 years. The age distribution observed aligns with global patterns, though a considerable subset of patients i.e. 21.43% presented under the age of 40, pointing towards a possible shift towards earlier onset, as reported in recent literature.[3]

The disease shows male dominance with M: F of 1.32:1. Similar prevalence was also shown in a study by Syeeda Shiraj et al and Kaushal et al.[15,16] Smoking and alcohol intake is associated with increased risk of colorectal cancer. In our study smoking history was reported in 23.39% and alcohol consumption in 23.30% of the total cases.

In a study by Sandhu et al 6.8% of the participants had family history of colorectal cancer which is not much different from 8.16% in our study.[17] Family history in

colorectal cancer can be due to shared dietary habit and life style along with inherited syndrome.

Colorectal cancers mostly present with rectal bleeding, abdominal pain or discomfort, change in bowel habits, unintended weight loss and fatigue. The most common presenting complaints were altered bowel habits reported in 100 patients (62.11%). Rectal bleeding, abdominal discomfort, unexplained weight loss and palpable abdominal lump were present in 80 patients (49.68%), 67 patients (41.61%), 63 patients (39.13%) and 23 patients (14.28 %) respectively. A study by Majumdar et al reported rectal bleeding in 58%, discomfort in 52% and change in bowel habit in 51%.[19] Skalitzky et al also reported unintentional weight loss in 32-40%.[18]

Globally especially in regions without routine screening stage III and IV are the most common presentation. In a recent evidence synthesis from 84 studies by Guo et al reported a median percentage of 23.7% in stage IV.[20] In our study also maximum number of patients presented in stage III and IV contributing a total of 46.69% and 30.66% respectively. This calls for a need for routine screening programs for early detection.

Colorectal cancer metastasises most commonly to liver followed by lungs, peritoneum, distant lymph nodes, bone and brain.[21] In our study also liver was the most common site of metastasis followed by lung, peritoneum and distant lymph.

According to World Health Oganization (WHO) histopathological classification, adenocarcinoma is the predominant histologic type. In our study adenocarcinoma accounted for 84.90% out of which 74.05% were moderately differentiated type. Other histopathological types were mucinous adenocarcinoma, Signet ring cell carcinoma and Squamous cell carcinoma accounting for 7.07%, 7.07% and 0.94% respectively. The predominance of adenocarcinomas especially moderately differentiated types matches trends observed in literatures. The presence of mucinous and signet ring histologies, though less common, suggests the importance of identifying histological subtypes that are often linked to aggressive clinical behaviour and poorer response to conventional therapies.

81 patients received neoadjuvant chemotherapy. Most commonly administered first line chemotherapy regime being FOLFOX 4 (60.49%), CAPOX (29.63%) and single agent capecitabine or S1 (12.34%). After 6 months course of chemotherapy, partial response was seen in 56.41%, stable disease in 29.49% and disease progression in 12.82% and only 1.28% had complete response.

Survival pattern of colorectal cancer is strongly determined by stage, tumour biology and treatment. Survival is excellent in early stages with 5-year survival reported as high as 94.7% in stage I, 88.4% in stage II, 63.3% in stage III and 31.5% in stage IV.[22] However, survival is lower in low- and middle-income countries. In certain parts of India and African countries 3-year overall survival reported was below 20%.[23] This may be attributed to limited access to routine screening and limited facilities to advanced treatment facilities. In our study also 2-year survival was observed in only 25.75%. This may be explained by maximum presentation at advanced stage with a significant proportion treated with palliative intent and limited access to optimum surgery and radiation techniques. The limited awareness, late presentation, and lack of routine screening likely contribute to this trend.

Limitations

Firstly, our study being a retrospective study, introduces possibility of information bias as the analysis relies on previously recorded data. Secondly, being a single centre study conducted in a tertiary care centre of North East India, it may not be representative of the entire population. Other limitations are limited sample size, heterogeneity in treatment received, limited molecular profiling and tailored treatment of the patients and limited follow up period.

CONCLUSION

CRC predominantly affected middle aged and elderly with some cases presenting before 40 years. Rectum involvement is more common and adenocarcinoma was the predominant histologic type. Majority of the patients presented in advanced stage where curative treatment options are limited leading to low survival outcome. These findings highlight the need for improved screening strategies and public awareness initiatives tailored to this specific population. Larger prospective study with longer follow up is needed to study the survival outcome of these patients.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021;71(3):209-49.
2. Asthana S, Khenchi R, Labani S. Incidence of colorectal cancers in India: A review from population-based cancer registries. Curr Med Res Prac. 2021;11(2):91-6.
3. Patel G, Patil P. Worrisome Trends in Young-Onset Colorectal Cancer: Now Is the Time for Action. Indian J Surg Oncol. 2022;13(3):446-52.
4. Shivshankar S, Patil PS, Deodhar K, Budukh AM. Epidemiology of colorectal cancer: A review with

special emphasis on India. Indian J Gastroenterol. 2025;44(2):142-53.
5. Ungvari Z, Fekete M, Varga P, Lehoczki A, Munkácsy G, Fekete JT, et al. Association between red and processed meat consumption and colorectal cancer risk: a comprehensive meta-analysis of prospective studies. Geroscience. 2025;47(3):5123-40.
6. Liang PS, Chen TY, Giovannucci E. Cigarette smoking and colorectal cancer incidence and mortality: systematic review and meta-analysis. Int J Cancer. 2009;124(10):2406-15.
7. Fedirko V, Tramacere I, Bagnardi V, Rota M, Scotti L, Islami F, et al. Alcohol drinking and colorectal cancer risk: an overall and dose-response meta-analysis of published studies. Ann Oncol. 2011;22(9):1958-72.
8. Ma Y, Hu M, Zhou L, Ling S, Li Y, Kong B, et al. Dietary fiber intake and risks of proximal and distal colon cancers: A meta-analysis. Medicine (Baltimore). 2018;97(36):e11678.
9. Ma Y, Yang Y, Wang F, Zhang P, Shi C, Zou Y, et al. Obesity and risk of colorectal cancer: a systematic review of prospective studies. PLoS One. 2013;8(1):e53916.
10. Cong YJ, Gan Y, Sun HL, Deng J, Cao SY, Xu X, et al. Association of sedentary behaviour with colon and rectal cancer: a meta-analysis of observational studies. Br J Cancer. 2014;110(3):817-26.
11. Keller DS, Windsor A, Cohen R, Chand M. Colorectal cancer in inflammatory bowel disease: review of the evidence. Tech Coloproctol. 2019;23(1):3-13.
12. Rozen P, Fireman Z, Figer A, Legum C, Ron E, Lynch HT. Family history of colorectal cancer as a marker of potential malignancy within a screening program. Cancer. 1987;60(2):248-54.
13. Søndergaard JO, Bülow S, Lynge E. Cancer incidence among parents of patients with colorectal cancer. Int J Cancer. 1991;47(2):202-6.
14. Charles S. Fuchs, Edward L. Giovannucci, Graham A. Colditz, David J. Hunter, Frank E. Speizer, and Walter C. Willett. A Prospective Study of Family History and the Risk of Colorectal Cancer. N Engl J Med. 1994;331:1669-74.
15. Shiraj SUM, Ferdousy B, M Mosiur, Papiya R, Tasmia I, Ummey SS, et al. Demographic and Clinicopathological Evaluation of Colorectal Adenocarcinoma in Bangladesh at a Tertiary Level Hospital. Cancer Studies Therap. 2023;8(1):1-8.
16. Rathore KS, Chandel UK, Singh N, Sharma SK. clinicpathological profile of colorectal cancer from a tertiary centre in northern india. Indian J Appl Res. 2025;15(2).
17. Sandhu MS, Luben R, Khaw KT. Prevalence and family history of colorectal cancer: implications for screening. J Med Screen. 2001;8(2):69-72.
18. Skalitzky MK, Zhou PP, Goffredo P, Guyton K, Sherman SK, Gribovskaja-Rupp I, et al. Characteristics and symptomatology of colorectal cancer in the young. Surgery. 2023;173(5):1137-43.
19. Majumdar SR, Fletcher RH, Evans AT. How does colorectal cancer present? Symptoms, duration, and clues to location. Am J Gastroenterol. 1999;94(10):3039-45.
20. Guo L, Wang L, Cai L, Zhang Y, Feng X, Zhu C, et al. Global Distribution of Colorectal Cancer Staging at Diagnosis: An Evidence Synthesis. Clin Gastroenterol Hepatol. 2025;23(12):2088-101.
21. Yang L, Yang X, He W, Liu S, Jiang C, Xie K, et al. Comparisons of metastatic patterns of colorectal cancer among patients by age group: a population-based study. Aging (Albany NY). 2018;10(12):4107-19.
22. Hong Y, Kim J, Choi YJ, Kang JG. Clinical study of colorectal cancer operation: Survival analysis. Korean J Clin Oncol. 2020;16(1):3-8.
23. Jiang Y, Yuan H, Li Z, Ji X, Shen Q, Tuo J, et al. Global pattern and trends of colorectal cancer survival: a systematic review of population-based registration data. Cancer Biol Med. 2021;19(2):175-86.

Cite this article as: Devi AS, Devi LP, Sinam N, Devi YS, Singh NP, Sangtam D, et al. Clinicopathological profile and survival outcome of colorectal cancer: a retrospective study from a tertiary care centre in North-East India. Int J Res Med Sci 2026;14:2500-4.