

A CLINICO-EPIDEMIOLOGICAL STUDY ON PATIENTS WITH COLORECTAL CANCER PRESENTED AT A TERTIARY HEALTH CARE CENTRE, RIMS, RANCHI, JHARKHAND, INDIA

Received : 10/04/2025
Received in revised form : 02/06/2025
Accepted : 18/06/2025

Keywords:
Colorectal Cancer (CRC), Bleeding Per Rectum, CEA Levels, Moderately Differentiated Adenocarcinoma, Non-Vegetarian Diet.

Corresponding Author:
Dr. Reema Bhagat,
Email: bhagatreema7@gmail.com

DOI: 10.47009/jamp.2025.7.3.207

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (3); 1076-1081



Farrukh Hassan¹, Archana Kumari², Reema Bhagat³, Muklesh kumar Mehta³, Sanjana Verma³, Kumar Gaurav³, Ranjeet Kumar Rajak³, Anupriya³

¹Associate Professor, Department of General Surgery, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

²Department of Physiology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

³Department of General Surgery, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

ABSTRACT

Background: Colorectal cancer is the second most common cancer in women and men affecting 9.7% population globally. Despite the declining rates of colorectal cancers since 1990 at the rate of 3% per year it is still the third most common cause of cancer deaths. The objective of this study is to analyze the demographic profile, clinical presentation, histopathological findings, and risk factors among Colorectal cancer patients at a tertiary care centre, RIMS, Ranchi. **Materials and Methods:** This is an observational study including 151 patients who presented to the Department of General Surgery, RIMS, Ranchi with complaints of bleeding per rectum, altered bowel habits, rectal pain and discharge, incontinence, abdominal pain and distention and loss of weight. **Result:** The study included 151 patients with a mean age of 49.6 years. The male-to-female ratio was approximately 3:2, with 92 males (60.9%) and 59 females (39.1%). The most common symptom was bleeding per rectum (62.2%), followed by altered Bowel Habit (55.0%) and abdominal lump (6.0%) and pain in the abdomen (23.8%). The rectum was the most common site (59.6%), followed by the sigmoid colon (19.9%) and ascending colon (9.9%). Higher CEA levels were observed in patients with metastasis. **Conclusion:** It highlights the importance of early clinical suspicion and lifestyle interventions in preventing the disease. DRE is an effective initial screening tool for mid and lower rectal cancer, but endoscopic and radiological evaluations are crucial for comprehensive assessment. The findings suggest enhanced screening protocols, especially for younger patients, and stronger public health strategies to reduce modifiable risk factors.

INTRODUCTION

from an uncontrolled proliferation of cells in the colon or rectum which are the parts of large intestine. It is the most common gastrointestinal tract malignancy.^[1] Globally, after breast cancer colorectal cancer is the second most common cancer in women and in males, it ranks third after lung and prostate cancer.^[2]

The incidence is more in the developed nations but mortality is higher in the low socioeconomic countries which may be contributed to the lack of awareness, lack of established screening protocols, and limited health resources.^[3] The screening

methods that can be used includes a colonoscopy, flexible sigmoidoscopy, guaiac-based faecal occult blood test, faecal immunochemical test, or multitargeted stool DNA. There has been an increasing incidence of colorectal cancer in young individuals in the recent past.^[3]

Recently India is seen to have an increase in colorectal cancer cases and an increase incidence in persons younger than 50 years of age.^[4] The cause of this early rise in colorectal cases is largely unknown but is assumed to be probably multifactorial.

This analysis aims to re-evaluate clinical presentation, risk factors, biochemical markers, and histological findings influencing colorectal carcinoma management to improve the fight against

this second most lethal cancer in terms of incidence and mortality.

Besides, through this study we have tried to find the role of clinical history, examination, investigations, and screening in early disease diagnosis and assessment, aiming to guide health resources for effective disease management.

MATERIALS AND METHODS

We conducted this single hospital based Observational Cross-Sectional study over the period of 12 months in the Department of General Surgery, RIMS, Ranchi, Jharkhand, India and included 151 patients with colorectal cancer.

Inclusion Criteria

The following patients were included:

1. All diagnosed cases of colorectal cancer
2. Patients of both male and female sex
3. Patients of age above 18 years

Exclusion Criteria

The following patients were excluded:

1. Patients on any anticoagulant therapy.
2. Patients with diagnosed liver cirrhosis.
3. Patients with known Hemolytic diseases.
4. Patients with history of trauma.

We conducted the study on all patients diagnosed with CRC at RIMS, Ranchi who met the predefined eligibility criteria. Detailed history was elicited from each patient with special preferences to family history, habits and symptomatology. Thorough physical examination was performed for evaluation of General condition, detection of signs and per rectal examination for all patients. Chest X-rays taken for all patients for preoperative evaluation as well as detection of secondaries. Routine blood investigations were done along with the serum CEA levels. Faecal occult blood test, faecal immunochemical test, or multitargeted stool DNA tests could not be done due to the unavailability of these tests. Colonoscopic evaluation and other radiological investigations done as indicated. For all possible cases, preoperative biopsy taken via Proctoscopic, Colonoscopic guidance and histologic type made out before planning treatment.

Data was recorded using google forms.

Age, sex, residence, religion, complaints of bleeding per rectum, presence of abdominal lump, etc. will be taken as nominal variables and expressed in proportion. Collected Data was entered in a standard template made in Microsoft excel spreadsheet and the same was transferred to SPSS Software version 25 for further analysis. We generated a data master-sheet for the variable study and presented the results in tabular form and percentage wise graphical representation. Continuous variables are presented as mean $\pm$ standard deviation. Categorical variables are presented as percentage and were analyzed using chi square test. p-value of less than 0.05 was considered statistically significant.

RESULTS

Demographic and Clinical Characteristics

The study included 151 patients with a mean age of 49.6 years (SD = 16.3, range: 16-85 years). The male-to-female ratio was approximately 3:2, with 92 males (60.9%) and 59 females (39.1%). The majority of the participants were non-vegetarians (93.4%), 37.1% of the study population was employed, followed by farmers (21.8%) and unemployed (18.5%).

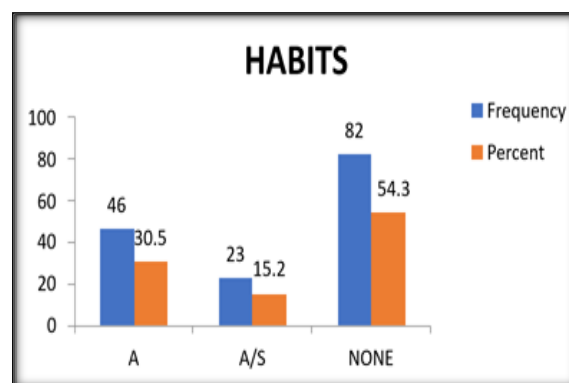


Figure 1: Habits of Study Participant

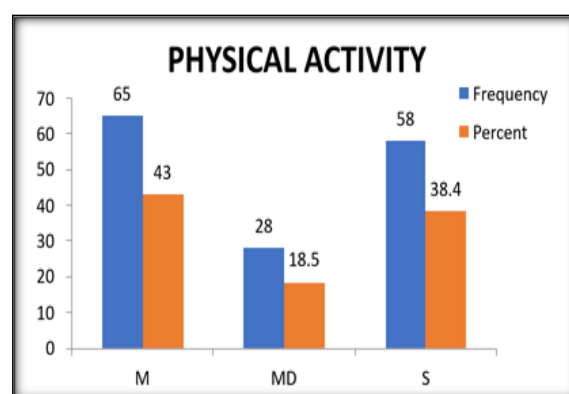


Figure 2: Physical Activity of Study Participant

Clinical Presentation

The clinical presentation of patients with colorectal cancer is summarized in [Table 2]. The most common symptom was bleeding per rectum (62.2%), followed by Abnormal Bowel Habit (55.0%) and abdominal lump (4.0%) and pain in the abdomen (23.8%).

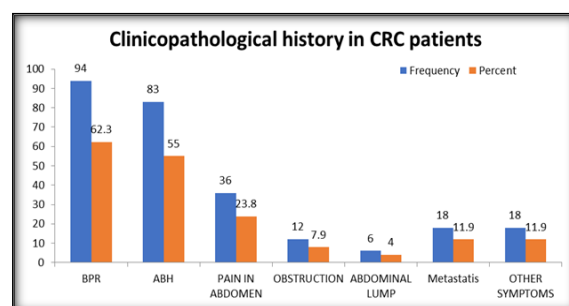


Figure 3: Clinicopathological History

Association of Symptoms with Gender

The association between clinical symptoms and gender is summarized in [Table 3]. A statistically significant association was found between bleeding per rectum and gender ($\chi^2 = 4.02$, $p = 0.045$), with a higher proportion of males (66.3%) reporting this symptom compared to females (55.9%). A significant association was found between bleeding per rectum and gender, with males more likely to report this symptom compared to females ($p = 0.045$).

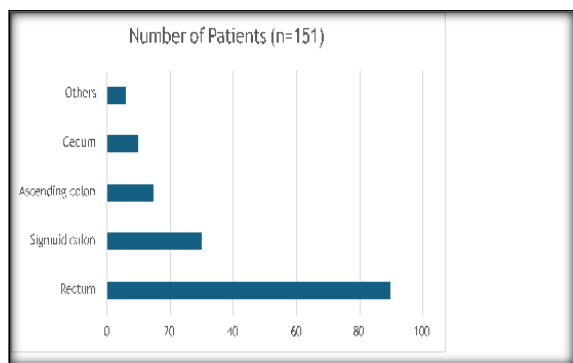


Figure 1: Site Distribution of Colorectal Cancer

CEA Levels and Tumor Characteristics

The serum CEA levels and their association with tumor characteristics are summarized in [Table 5]. The mean CEA level was 30.6 ± 24.03 ng/mL, with a wide range of 2 to 119 ng/mL. Higher CEA levels were observed in patients with metastasis.

Site Distribution of Colorectal Cancer

The distribution of tumor sites in patients with CRC is summarized in [Table 4]. The rectum was the most common site (59.6%), followed by the sigmoid colon (19.9%) and ascending colon (9.9%).

Higher CEA levels were observed in patients with metastasis.

Clinical, Colonoscopy finding and Radiological Findings in Colorectal Cancer

Among the 151 patients examined using Digital Rectal Examination (DRE), 55.6% had ulceroproliferative growth, while 10.6% had proliferative growth (PR) growth. No abnormality was detected in 33.8% of cases as shown in figure.

Colonoscopic Findings: sites involved: [Table 7] summarizes the distribution of lesions detected during colonoscopy. The rectum was the most common site of lesions, accounting for 50.3% of cases. The second most affected region was the ascending colon (9.9%). Multiple-site involvement

was noted in 4.6% of cases. Other locations such as the descending colon, sigmoid colon, and rectosigmoid junction contributed to a smaller proportion of findings.

Distribution of Histopathological Examination (HPE) Findings:

The most common histopathological finding observed was Moderately Differentiated Adenocarcinoma (MDAC), accounting for 56.3% of cases. This was followed by Well Differentiated Adenocarcinoma (WDAC) (21.2%) and Poorly Differentiated Adenocarcinoma (PDAC) (10.6%). Mucinous Adenocarcinoma was identified in 2.0% of cases, while Adenocarcinoma (ADC) and its variants were found in 5.3%. Rare histological subtypes included Signet Ring Cell Carcinoma (SRC ADC) (1.3%) and Adenocarcinoma with Metastasis (0.7%). Other rare subtypes collectively accounted for 2.0% of cases. This data highlights that MDAC remains the predominant histological subtype.

Laboratory and Radiological Findings

The laboratory and radiological findings in patients with CRC are summarized in [Table 9]. Elevated serum CEA levels (>5 ng/mL) were observed in 66.2% of patients, and liver metastasis was the most common site of metastasis (7.9%).

Risk Factor Analysis

The distribution of risk factors among patients with colorectal cancer is summarized in [Table 10]. The most common risk factor was a non-vegetarian diet (93.4%) and Tobacco use (93.4%) followed by Sedentary physical activity (38%). A family history of colorectal cancer (CRC) was reported in 4.6% of patients. Mean BMI of CRC patient was 19.59 ± 2.36 .

Interpretation

The study found that non-vegetarian diet and tobacco consumption were the most common risk factors for colorectal cancer, followed by sedentary physical activity. A family history was relatively rare, suggesting that environmental and lifestyle factors may play a more significant role in this population.

Biostatistical Analysis: The results of biostatistical analyses are summarized in [Table 11]. Significant associations were observed between age, sex, diet, tumor stage, and metastasis ($p < 0.05$). Patients aged ≥ 50 had significantly higher CEA levels compared to younger patients ($p = 0.001$). Males were more likely to report bleeding per rectum than females ($p = 0.045$). Non-vegetarian diet was associated with a higher risk of metastasis ($p = 0.001$).

Table 1: Demographic Characteristics of Study Population.

Variable (Age in years)	Frequency (n=151)	Percentage (%)
<30	15	9.9%
31–50	55	36.4%
51–70	65	43.0%
71+	16	10.6%
Sex		
Male	92	60.9
Female	59	39.1
Diet		
Vegetarian	10	6.6

Non-Vegetarian	141	93.4
Occupation		
Employed	56	37.1
Unemployed	33	21.8
Others	28	18.5

Table 2: Clinical Presentation of Patients with Colorectal Cancer.

Symptom	Frequency	Percentage (%)
Bleeding Per Rectum (BPR)	94	62.2
Abdominal Lump	6	4.0
Pain in Abdomen	36	23.8
Abnormal Bowel Habit (ABH)	83	55.0
Obstruction	12	7.9
Other symptoms (e.g., distension, fatigue)	40	26.5

Table 3: Association of Symptoms with Gender.

Clinical Feature	Male (n=92)	Female (n=59)	Chi-Square (χ^2)	p- value
Bleeding Per Rectum	61 (66.3%)	33 (55.9%)	4.02	0.045*
Altered Bowel Habits (ABH)	48 (52.3%)	35 (59.6%)	0.29	0.59
Abdominal Lump	4(4.3%)	2(3.1%)	0.796	0.86
Pain in Abdomen	24 (26.1%)	12 (20.3%)	0.72	0.39
Obstruction	8 (8.7%)	4 (6.8%)	0.14	0.71

(*Statistically significant at $p < 0.05$)

Table 4: Site Distribution of Colorectal Cancer.

Site	Number of Patients (n=151)	Percentage (%)
Rectum	90	59.6%
Sigmoid colon	30	19.9%
Ascending colon	15	9.9%
Cecum	10	6.6%
Others	6	4.0%

Table 5: CEA Levels and Tumor Characteristics.

Parameter	Mean (SD)	Range
CEA Level (ng/mL)	30.6 (24.03)	2 - 119

Table 6: Digital Rectal Examination (DRE) Findings in Patients.

DRE Findings	Frequency (n)	Percentage (%)
No Abnormality Detected (NAD)	51	33.8
Proliferative Rectal Growth	16	10.6
Ulceroproliferative Rectal Growth	84	55.6

Table 7: Distribution of Lesion Sites in Colonoscopy Findings (n = 151).

Site of Lesion	Findings	Frequency (n)	Percentage (%)
Anal Canal & Anorectal	Anorectal Growth/Mass	3	2.0
Rectum	Rectal Growth/Mass, Rectal Wall, Thickening, Rectal Polyp,	76	50.3
Sigmoid Colon	Sigmoid Growth/Mass, Stricture at Sigmoid	5	3.6
Descending Colon	DC Mass	5	3.6
Ascending Colon	AC Mass	15	9.9
Cecum	Cecal Mass	6	4.3
Hepatic Flexure	Hepatic Flexure Mass	1	0.7
Transverse Colon	Tr. Colon Mass	1	0.7
Splenic Flexure	SC Mass	6	4.0
RSJ (Rectosigmoid Junction)	RSJ Mass/Thickening, RSJ & Sigmoid Mass, Unhealthy Mucosa at RSJ	7	4.6
Multiple Sites	AC + Cecal Mass, Rectum + RSJ Mass, Rectum + Sigmoid Mass	7	4.6

(AC = Ascending Colon, RSJ = Rectosigmoid Junction, DC = Descending Colon, SC = Splenic Flexure)

Table 8: Distribution of Histopathological Examination (HPE) Findings.

HPE Type	Frequency (n)	Percentage (%)
MDAC (Moderately Differentiated Adenocarcinoma)	84	55.6%
WDAC (Well Differentiated Adenocarcinoma)	32	21.2%
PDAC (Poorly Differentiated Adenocarcinoma)	16	10.6%
Adenocarcinoma (variants)	14	9.3%
Mucinous Adenocarcinoma	3	2.0%
Signet Ring Cell Carcinoma (SRC)	2	1.3%
Adenocarcinoma with Metastasis	1	0.7%
Other Rare Subtypes	3	2.0%
Total	151	100.0%

Table 9: Laboratory and Radiological Findings in Patients with Colorectal Cancer.

Category	Subcategory	Number of Patients (n=151)	Percentage (%)
Serum CEA Levels	Elevated (>5ng/ml)	100	66.2%
	Normal (≤5 ng/ml)	51	33.8%
Metastasis	No Metastasis	133	88
	Liver	12	7.9
	Liver + Lung	1	0.6
	Lymph Nodes	1	0.6
	LN + Lung + Bone	1	0.6
	Mesenteric	1	0.6
	Peritoneum	2	1.3

Table 10: Risk Factor Analysis.

Risk Factor	Frequency	Percentage (%)
Non-Vegetarian Diet	141	93.4
Tobacco Use	141	93.4
Family History of CRC	7	4.6
Sedentary Physical activity	58	38.0
Mean BMI	19.59 ± 2.36	

Table 11: Biostatistical Analysis.

Variable	Comparison	Test Used	Test Statistic	p-value	Interpretation
Age	Age ≥50 vs. Age <50	Independent t-test	t = 3.45	0.001*	Patients aged ≥50 had significantly higher CEA levels (p < 0.05).
Sex	Male vs. Female (Bleeding Per Rectum)	Chi-square test	χ ² = 4.02	0.045*	Males were more likely to report bleeding per rectum (p < 0.05).
Diet	Non-Vegetarian vs. Vegetarian	Chi-square test	χ ² = 10.56	0.001*	Non-vegetarian diet was associated with higher metastasis risk (p < 0.05).
Tumor Stage	Stage I/II Stage III/IV vs.	Independent t-test	t = 5.67	0.001*	Advanced-stage tumors had significantly higher CEA levels (p < 0.05).
Metastasis	Presence Absence vs.	Chi-square test	χ ² = 15.67	0.001*	Metastasis was significantly associated with elevated CEA levels (p < 0.05).
Family History CRC	Present Absent vs.	Chi-square test	χ ² = 0.72	0.39	No significant association between family history and tumor stage (p > 0.05).

(Statistically significant at p < 0.05)

DISCUSSION

Colorectal cancer (CRC) remains a significant public health challenge, with variations in incidence, risk factors, and diagnostic approaches. This study aimed to analyze the demographic profile, clinical presentation, histopathological findings, and risk factors among CRC patients at RIMS, Ranchi. The findings have been compared with existing literature to evaluate trends and implications.

In the present study, the mean age of CRC patients was 49.6 years, aligning with previous reports that CRC is increasingly being diagnosed in younger populations. Studies suggest that younger patients present with more aggressive tumor types and are diagnosed at later stages due to delayed suspicion and screening.^[5] The male-to-female ratio was approximately 3:2, consistent with global trends where CRC incidence is higher in males, potentially due to lifestyle factors, genetic predisposition, and hormonal differences.^[6]

The most common presenting symptoms in this study were bleeding per rectum (62.2%), followed by Abnormal Bowel Habit (55.0%) and pain in abdomen (23.8%). Previous studies have similarly reported rectal bleeding as a key early symptom, often leading to late-stage diagnosis due to delays in medical consultation.^[7] A significant association between

gender and bleeding per rectum (p=0.045) was observed, highlighting the need for heightened awareness, particularly in at-risk groups.

The most frequently observed histopathological type was Moderately Differentiated Adenocarcinoma (56.3%), followed by Well Differentiated Adenocarcinoma (21.2%) and Poorly Differentiated Adenocarcinoma (10.6%). These results align with global studies where MDAC is the predominant subtype, indicating a generally moderate prognosis.^[8] Rare subtypes, including Signet Ring Cell Carcinoma (1.3%) and Mucinous Adenocarcinoma (2.0%), were noted, which are typically associated with poorer prognoses and increased metastatic potential.^[9]

Digital Rectal Examination (DRE) detected rectal growth in 65.6% of patients, making it a crucial initial screening tool.

Colonoscopy confirmed rectal & colonic growth in 67.4%, underlining its role in visual diagnosis. Colonoscopy remains the gold standard for CRC detection, but imaging plays a crucial role in assessing tumor extent and metastasis.^[10] The study identified key risk factors associated with CRC: Dietary Habits: A high prevalence of non-vegetarian diet (93.4%) aligns with studies indicating that red and processed meat consumption increases CRC risk.^[11] Tobacco Use (93.4%) were significantly associated, consistent with literature emphasizing

their carcinogenic impact.^[12] Physical Inactivity (38.0%) suggest lifestyle modifications as crucial preventive strategies. Family History of CRC (4.6%) was low but reinforces the need for genetic screening in select cases.

CONCLUSION

Bleeding per rectum was the most common symptom, emphasizing the need for early clinical suspicion. Lifestyle interventions could play a crucial role in CRC prevention. MDAC was the predominant histopathological subtype, and DRE emerged as an effective initial screening tool, but endoscopic and radiological evaluations were essential for comprehensive assessment.

The study suggests improved screening protocols, especially for younger patients, and stronger public health strategies to reduce modifiable risk factors associated with colorectal cancer (CRC). Future research should focus on molecular profiling and genetic predisposition to improve targeted screening and therapeutic strategies.

REFERENCES

1. Mishra R, Pandey A, Mishra H, Singh TB, Mandal A, Asthana AK. Clinico-epidemiological profile and treatment outcome in adolescents and young patients of rectal cancer attending a tertiary cancer center. *J Cancer Res Ther.* 2023 Oct 1;19(7):2005-2011. 10.4103/jcrt.jcrt_319_22.
2. Saha Navin S, Mritunjay, Sinha C.P. et al. A study on presentation and behavior of colo-rectal carcinoma in jharkhand gjra - global journal for research analysis 2020, 10.36106/gjra
3. Thanikachalam K, Khan G. Colorectal Cancer and Nutrition. *Nutrients.* 2019 Jan 14;11(1):164. 10.3390/nu11010164.
4. Wong MCS, Huang J, Lok V, et al. Differences in Incidence and Mortality Trends of Colorectal Cancer Worldwide Based on Sex, Age, and Anatomic Location. *Clin Gastroenterol Hepatol.* 2021 May;19(5):955-966.e61. 10.1016/j.cgh.2020.02.026.
5. di Martino E, Smith L, Bradley SH, et al. Incidence trends for twelve cancers in younger adults-a rapid review. *Br J Cancer.* 2022 Jun;126(10):1374-1386. 10.1038/s41416-022-01704-x.
6. Roshandel G, Ghasemi-Kebria F, Malekzadeh R. Colorectal Cancer: Epidemiology, Risk Factors, and Prevention. *Cancers (Basel).* 2024 Apr 17;16(8):1530. 10.3390/cancers16081530.
7. Percac-Lima S, Pace LE, Nguyen KH, et al. Diagnostic Evaluation of Patients Presenting to Primary Care with Rectal Bleeding. *J Gen Intern Med.* 2018 Apr;33(4):415-422. 10.1007/s11606-017-4273-x.
8. Fleming M, Ravula S, Tatishchev SF, et al. Colorectal carcinoma: Pathologic aspects. *J Gastrointest Oncol.* 2012 Sep;3(3):153-73. 10.3978/j.issn.2078-6891.2012.030.
9. Hugen N, van de Velde CJH, de Wilt JHW, et al. Metastatic pattern in colorectal cancer is strongly influenced by histological subtype. *Ann Oncol.* 2014 Mar;25(3):651-657. 10.1093/annonc/mdt591.
10. Jayasinghe M, Prathiraja O, Caldera D, et al. Colon Cancer Screening Methods: 2023 Update. *Cureus.* 2023 Apr 12;15(4):e37509. 10.7759/cureus.37509.
11. Ungvari Z, Fekete M, Varga P. Association between red and processed meat consumption and colorectal cancer risk: a comprehensive meta-analysis of prospective studies. *Geroscience.* 2025 Apr 10. 10.1007/s11357-025-01646-1.
12. Tsoi KK, Pau CY, Wu WK, et al. Cigarette smoking and the risk of colorectal cancer: a meta-analysis of prospective cohort studies. *Clin Gastroenterol Hepatol.* 2009 Jun;7(6):682-688.e1-5. 10.1016/j.cgh.2009.02.016..