

# Evaluating indications and findings of colonoscopy in the Gastroenterology and Hepatology Teaching Hospital in Baghdad

Suhair Aboud Essa<sup>a</sup>, Hiba D. Al-Ameri<sup>b</sup>, Farah L. R. Al-Rufae<sup>c</sup>, Hayder J. Mahmood<sup>d</sup>.

## ABSTRACT

**INTRODUCTION:** Colonoscopy is an effective and safe method of diagnosing colorectal diseases.

**OBJECTIVE:** This study aimed to assess the indications for and findings of colonoscopy in patients undergoing the procedure.

**METHODS:** This retrospective descriptive study reviewed the records of 697 patients who underwent colonoscopy at the Gastroenterology and Hepatology Teaching Hospital in Baghdad Governorate between 1 January and 31 July 2023. The analysis included age, sex, indications for colonoscopy, and endoscopic findings.

**RESULTS:** The study population had a nearly equitable distribution between sexes, with a mean age of 42.24 years. The most common indications for colonoscopy were rectal bleeding (31.4%), chronic abdominal pain (22.1%), and chronic diarrhoea (20.5%). Abnormal findings were observed in nearly 47% of participants, with polyps (17.6%) being the most common abnormality. Colorectal cancer was diagnosed in 2.9% of the study people, predominantly rectal carcinoma (60%). Advanced age, rectal bleeding, chronic constipation, chronic anaemia, and unexplained weight loss were significantly correlated with the presence of colonic malignancies within the study cohort.

**CONCLUSION:** This study found that the most common indication for colonoscopy was rectal bleeding, and the most common pathology detected was colonic polyps. CRC was diagnosed in 2.9% of patients. Increasing age, rectal bleeding, chronic constipation, chronic anaemia, and weight loss were significant clinical predictors of CRC on colonoscopy.

**Key words:** Colonoscopy, colorectal cancer, rectal bleeding, screening, Baghdad, Iraq.

## INTRODUCTION

Colonoscopy is a cornerstone of modern gastroenterological practice. It enables direct visualization and evaluation of the colonic mucosa, yielding invaluable diagnostic insights into various disorders affecting the rectum, colon, and terminal portion of the ileum.<sup>[1]</sup> Advancements in endoscopic technology, coupled with a growing body of evidence, have refined the role of colonoscopy in diagnosing and managing a wide spectrum of gastrointestinal (GI) conditions.<sup>[2,3]</sup>

The indications for colonoscopy encompass a broad spectrum, ranging from screening at-

risk individuals for colorectal cancer (CRC) to the assessment of chronic abdominal pain, GI bleeding, unexplained anaemia, altered bowel habits, infective colitis, inflammatory bowel disease (IBD), and an abnormality found on abdominal ultrasound, colonic X-rays, barium enema or a computerized tomographic (CT) scan.<sup>[4]</sup> Further, the clinical utility of colonoscopy extends to enabling targeted tissue sampling for histopathological evaluation, facilitating the detection of early-stage malignancies, and offering therapeutic interventions such as polypectomy, control of bleeding, stricture dilation, stent placement, and ablation of neo-

**a:** MBChB, FICMS. Consultant Family Physician, Al-Yarmouk Teaching Hospital, Baghdad, Iraq. **b:** MBChB, FABHS. Senior Community Medicine, Al-Imamain Al-Kadhmain Medical City, Baghdad, Iraq. **c:** MBChB, MSc. Pathologist, Al-Yarmouk Teaching Hospital, Baghdad, Iraq. **d:** MBChB, FABHS. Consultant Gastroenterologist and Hepatologist, The Gastroenterology and Hepatology Teaching Hospital, Baghdad, Iraq.

**Corresponding Author:** Suhair Aboud Essa, E mail: [suhairabbod@gmail.com](mailto:suhairabbod@gmail.com).



plasms.<sup>[4,5]</sup>

In our centre, limited data exist regarding colonoscopy indications and findings. Therefore, this study aimed to evaluate the indications for colonoscopy and the findings of patients who underwent colonoscopy at a tertiary care hospital in Baghdad.

## METHODS

**Setting and Study Design:** A retrospective descriptive study was performed at the Gastroenterology and Hepatology Teaching Hospital in Baghdad, Iraq, by reviewing the records of all patients who underwent colonoscopy between 1 January and 31 July 2023.

**Ethical consideration:** The study was conducted according to the Helsinki Declaration, and ethical approval was obtained from the research committee at the Gastroenterology and Hepatology Teaching Hospital.

**Case definition;** inclusion and exclusion criteria: All patients undergoing colonoscopy for various reasons during the stated period were included in the study, which were 738. All data were verified to exclude duplicated cases. Incomplete medical records, inadequate biopsy specimens, or procedures classified as unsuccessful due to poor bowel preparation or patient intolerance during the colonoscopy examination were excluded. Consequently, 697 eligible participants were finally enrolled in the final analysis.

**Outcomes:** From the colonoscopy registries, we retrieved age, sex, indications for the colonoscopy, endoscopic findings, and extent of colon intubation. Biopsy was done according to the endoscopist's discretion. The biopsies taken were examined by experienced histopathologists at the histopathology department of the same hospital according to the laboratory's protocol of work.

**Statistical Analysis:** The data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS 25.0). Central tendency measures such as mean and percentages were employed following the nature of the data.

The chi-square test was performed to determine the significance of the association when comparing categorical data. An unconditional binary logistic regression model was used to estimate the odds ratios (ORs) of CRC-related high-risk factors and corresponding 95% confidence intervals (CIs). The level of statistical significance was set at 0.05.

## RESULTS

A total of 738 patients had colonoscopies during the study period. After removing patients who met the exclusion criteria, 697 patients' data were analyzed. Of these, 343 (49.2%) were female, and 354 (50.8%) were male, with a male-to-female ratio of 1.03:1. The mean age of the study population was

Table 1 | Sex and age distribution

Variable	No. (%)	
Sex	Male	354 (50.8)
	Female	343 (49.2)
Age (year)	≤20	105 (15.1)
	21-30	101 (14.5)
	31-40	111 (15.9)
	41-50	127 (18.2)
	51-60	119 (17.1)
	61-70	93 (13.3)
	>70	41 (5.9)
<b>Total</b>	<b>697 (100.0)</b>	

Table 2 | Indications for colonoscopy

Indications	N (%)
Rectal bleeding	219 (31.4)
Chronic abdominal pain	154 (22.1)
Chronic diarrhoea	143 (20.5)
Chronic constipation	72 (10.3)
Altered bowel habits	48 (6.9)
Chronic anemia	25 (3.6)
Weight loss	43 (6.2)
Surveillance	69 (9.9)
Polypectomy	30 (4.3)
Abnormality on imaging	39 (5.6)
Screening	18 (2.6)
Other indications	20 (2.9)

Table 3 | Final diagnosis

Diagnosis	N (%)
Normal	367 (52.7)
Ulcerative Colitis	41 (5.9)
Crohn's Disease	14 (2.0)
Familial adenomatous polyposis	4 (0.6)
Foreign body removal	2 (0.3)
Cancer	20 (2.9)
Solitary rectal ulcer	17 (2.4)
Diverticula	16 (2.3)
Fistula	2 (0.3)
Fissure	4 (0.6)
Hemorrhoids	63 (9.0)
Telangiectasia	2 (0.3)
Granulomatous reaction to foreign body	1 (0.1)
Polyps	123 (17.6)
Proctitis	14 (2.0)
Colitis	36 (5.2)
Stenosis	6 (0.9)

42.24 ± 20.17 years.

The median age of the study population was 38 years (ranging from 9 months to 95 years). The 41 to 50 years age group had the highest frequency of 127 (18.2%) participants, followed by the 51 to 60 years age group with 119 (17.1%) participants, while more than 70 years age group had the lowest frequency of 41 (5.9%) participants. The details of the sex

and age distribution of the study population are shown in Table 1.

The commonest indications for colonoscopy were rectal bleeding 219 (31.4%) followed by chronic abdominal pain 154 (22.1%) and chronic diarrhoea 143 (20.5%). Other less common indications, including rectal prolapse, tenesmus, faecal incontinence, anorectal fistula, foreign body removal, and volvulus for sigmoidoscopy, constituted only 2.9% of the participants. Additionally, 69 (9.9%) patients underwent surveillance colonoscopy due to previous colonic polyps, resected carcinoma, or follow-up for inflammatory bowel disease. Some patients presented with multiple indications. The various indications for which colonoscopy was done are listed in Table 2.

Abnormal findings were detected in 47.3% of colonoscopies, with polyps being the most common abnormality (17.6%), followed by haemorrhoids (9%), ulcerative colitis (5.9%), and colitis of unspecified aetiology (5.2%). Some patients had multiple abnormalities. Over half of the patients (52.7%) had normal colonoscopy findings. The frequency of enrolled participants classified according to the final diagnosis is shown in Table 3.

Colorectal cancer was diagnosed in 20 (2.9%) patients, with rectal carcinoma being the most prevalent (60%), followed by sig-

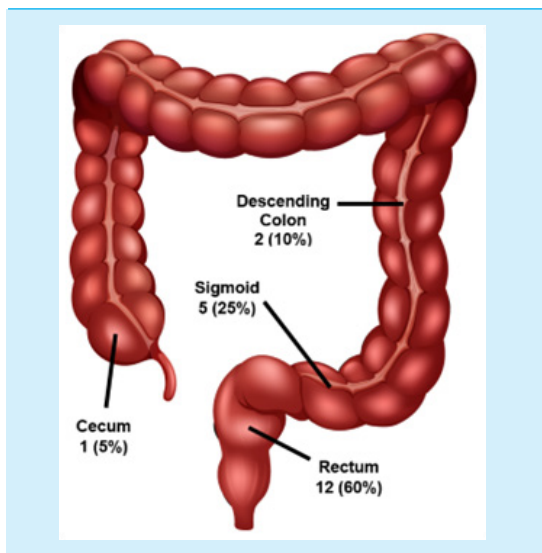


Figure 1 | Distribution of the CRC on parts of the colon

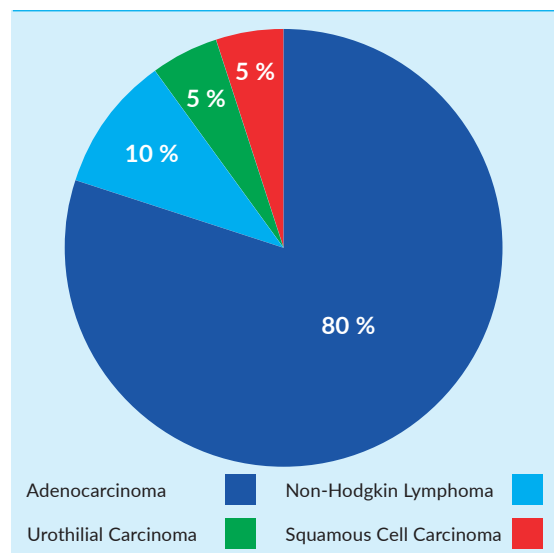


Figure 2 | Distribution of the CRC on parts of the colon

**Table 4 |** Association between demographic characteristics and colorectal cancer

Variable	Colorectal cancer		Total	X <sup>2</sup>	p-value
	Yes	No			
<b>Sex</b>				0.6989	0.4031
<b>Male</b>	12 (3.4%)	342 (96.6%)	354 (100.0%)		
<b>Female</b>	8 (2.3%)	335 (97.7%)	343 (100.0%)		
<b>Age ( years)</b>				10.1143	0.0015
<b>≤50</b>	6 (1.4%)	438 (98.6%)	444 (100.0%)		
<b>&gt;50</b>	14 (5.5%)	239 (94.5%)	253 (100.0%)		
<b>TOTAL</b>	20 (2.9%)	677 (97.1%)	697 (100.0%)		

moid colon (25%), descending colon (10%), and cecum (5%). **Figure 1** shows the distribution of the malignancies along the colon. Adenocarcinoma accounted for 80% of the malignancies, while non-Hodgkin lymphoma, squamous cell carcinoma, and urothelial carcinoma collectively comprised the remaining 20%, **Figure 2**.

**Table 4** shows that the prevalence of CRC increases with age. Only 1.4% of study participants aged 50 years and younger have CRC, while 5.5% of those over 50 years old have CRC. This difference is statistically significant (p=0.0015). The table also shows a slightly higher prevalence of CRC in males (3.4%) than in females (2.3%). However, this difference is not statistically significant (p=0.4031).

Furthermore, the study explored the predictive role of main indications in CRC development. Notably, rectal bleeding (OR, 9.34; 95% CI, 3.08-28.28, p=0.0001), chronic constipation (OR, 3.03; 95% CI, 1.07-8.61, p=0.0370), chronic anaemia (OR, 5.25; 95% CI, 1.43-19.26,

p=0.0123), and weight loss (OR, 5.61; 95% CI, 1.93-16.24, p=0.0015) were significantly associated with increased risk of CRC, while no statistical differences were observed for other indications, **Table 5**.

## DISCUSSION

Colonoscopy is an effective and safe method of diagnosing colorectal diseases. The clinical features and outcomes of colonoscopy examinations vary depending on the geographic region and the population studied. The present study provides an overview of the indications and findings of colonoscopy in a large cohort of patients who presented with lower GI symptoms at a tertiary care centre in Baghdad. In Iraq, data about colonoscopy indications and findings are limited, making this study valuable to the existing knowledge.

This study revealed a nearly equal distri-

**Table 5 |** Association between indications for colonoscopy and colorectal cancer

Variable	Colorectal cancer		Odds ratio (95% CI)	p-value
	Yes	No		
<b>Rectal bleeding</b>	16 (80)	203 (30.0)	9.34 (3.08-28.28)	0.0001
<b>Chronic abdominal pain</b>	1 (5)	153 (22.6)	0.18 (0.02-1.36)	0.0962
<b>Chronic diarrhoea</b>	1 (5)	142 (21.0)	0.19 (0.03-1.49)	0.1163
<b>Chronic constipation</b>	5 (25)	67 (9.9)	3.03 (1.07-8.61)	0.0370
<b>Altered bowel habit</b>	2 (10)	46 (6.8)	1.52 (0.34-6.77)	0.5796
<b>Chronic anemia</b>	3 (15)	22 (3.2)	5.25 (1.43-19.26)	0.0123
<b>Weight loss</b>	5 (25)	38 (5.6)	5.61 (1.93-16.24)	0.0015
<b>Abnormality on imaging</b>	3 (15)	36 (5.3)	3.14 (0.88-11.22)	0.0778
<b>Screening</b>	1 (5)	17 (2.5)	2.04 (0.26-16.16)	0.4982
<b>TOTAL</b>	20 (2.9%)	677 (97.1%)		

bution of male and female participants, with a male-to-female ratio of 1.03:1. This is consistent with the findings of studies conducted in Libya and Iran.<sup>[6,7]</sup> However, other studies conducted in Italy, Ghana, Nigeria, Kuwait, and Egypt showed a male predominance among colonoscopy patients.<sup>[4,8-11]</sup> This suggests that diseases requiring colonoscopy had similar risk and prevalence among both sexes in our study cohort. Cultural factors might additionally influence the likelihood of men and women seeking colonoscopy.

In this study, the mean age of participants was 42.24 years. This is similar to the mean age reported in Egypt (42.5 years)<sup>[11]</sup> but remarkably lower than that reported in Italy, Iran, Ghana, and Nigeria (64.4, 56.7, 53.4, and 48.9 years, respectively).<sup>[4,7-9]</sup> This suggests that lower GI diseases may manifest slightly earlier in our country.

The most common indications for colonoscopy were rectal bleeding (31.4%), chronic abdominal pain (22.1%), and chronic diarrhoea (20.5%), which is consistent with previous studies conducted in Iraq and other countries.<sup>[1,8,9,12,13]</sup> It is not surprising that our study, as in several other studies, found bleeding per rectum and chronic abdominal pain as the commonest indications for colonoscopy since these alarming symptoms are problems that prompt patients to seek urgent medical help.

Screening colonoscopy was indicated for only 2.6% of the participants in our study, which is remarkably low. This low screening rate could be indicative of the absence of a national colorectal screening program and limited public awareness regarding CRC and its prevention. In contrast, a retrospective comparative study conducted in two hospitals in China and the United States of America found that screening for colorectal tumours was the most common indication.<sup>[14]</sup> This highlights the significant disparity in preventive medicine practices between developing countries, such as ours, and developed countries.

Our study has demonstrated an overall diagnostic yield of 47.3%, with 52.7% of participants exhibiting normal colonoscopic find-

ings. This figure aligns with findings from some studies and deviates from others.<sup>[7-13,15]</sup> These variations in diagnostic yield can be attributed to variations in sample size, geographic diversity in colonic diseases, and differences in patient selection criteria. The relatively high rate of negative results in this study is consistent with the typical pattern observed in endoscopy services, where negative results provide both relief to patients and valuable information to referring physicians.<sup>[16]</sup> However, it may also indicate either weak indications for colonoscopy or a relatively low threshold for referral, potentially driven by a desire to alleviate patients' anxiety.

In our study, the most common pathological abnormality detected by colonoscopy was colonic polyps (17.6%), highlighting the importance of colonoscopy in detecting these premalignant lesions. Other notable findings included haemorrhoids (9%) and IBD (7.9%). Previous observational investigations conducted in Erbil and Baghdad have documented that colorectal polyps were observed in 16% and 9.2% of patients undergoing colonoscopy, respectively.<sup>[13,17]</sup> Conversely, studies conducted in Kuwait, Ghana, and Indonesia identified haemorrhoids, CRC, and IBD as the predominant diagnoses during colonoscopy.<sup>[10,15,18]</sup> The variations in colonoscopy findings can be attributed to differences in race, geographic location, lifestyle, behaviours, diets, environmental factors, and the expertise of the colonoscopist.

Our study found a CRC prevalence of 2.9%, which is significantly lower than the rates reported in previous regional and global studies.<sup>[1,7-12,18]</sup> This discrepancy is likely because CRC is primarily a disease of the elderly, and only 36.3% of our study sample was aged 50 years or older. This demographic distribution likely resulted in the reduction of malignant cases within our study population. Globally, CRC is the third most common cancer and the second leading cause of cancer-related deaths.<sup>[19]</sup> In Iraq, CRC is the seventh most common cancer and the eighth leading cause of cancer-related deaths, with an incidence rate of 3.7%,<sup>[20]</sup> consistent with the prevalence rate (2.9%) found in this study.



In our study, the majority of patients diagnosed with CRC were above 50 years old (70%). Regarding the anatomical distribution of these cancers, a substantial proportion of tumours were localized in the rectosigmoid region (85%), and a significant majority were identified as adenocarcinomas (80%). These findings are consistent with those of a prior retrospective study conducted in the north of Iran and another descriptive study conducted at Al-Yarmouk Teaching Hospital in Baghdad.<sup>[7,21]</sup>

Another significant finding of our study was the association between certain clinical predictors and CRC. We found that increasing age, rectal bleeding, chronic constipation, chronic anaemia, and weight loss were significantly correlated with the presence of CRC on colonoscopy. These results agree with previous studies that identified these factors as potential markers of increased CRC risk.<sup>[11,22,23]</sup> These predictors can facilitate targeted screening and early detection of this malignancy, thereby improving patient outcomes.

Individuals exhibiting any of these clinical predictors should undergo a comprehensive medical assessment that includes a colonoscopy, as these symptoms may indicate the presence of CRC. The disease's stage significantly influences the prognosis of CRC at the time of diagnosis. The earlier the cancer or its precursors is diagnosed, the greater the likelihood of a favourable outcome. Early cancer detection can be achieved through the widespread implementation of screening initiatives, such as colonoscopy, for at-risk individuals.<sup>[24-26]</sup>

**Limitations:** Our study has some limitations that should be acknowledged. First, it was a retrospective study that relied on the accuracy and completeness of the medical records. Second, it is a single-centre study that may not reflect the practice and outcomes of colonoscopy in other regions of Iraq.

## CONCLUSION

This study found that the most common indication for colonoscopy was rectal bleeding, and the most common pathology detected was

colonic polyps. CRC was diagnosed in 2.9% of patients. Increasing age, rectal bleeding, chronic constipation, chronic anaemia, and weight loss were significant clinical predictors of CRC on colonoscopy.

The study highlights the importance of colonoscopy in diagnosing and managing colorectal diseases, especially in patients with alarm symptoms of CRC. The study recommends the widespread implementation of screening colonoscopy for at-risk individuals to facilitate early cancer detection and improve patient outcomes. Further studies with larger sample sizes and multicenter designs are needed to validate these findings and better understand the factors associated with CRC in the Iraqi population.

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**Abbreviations list:** Confidence intervals (CIs), Colorectal cancer (CRC), Computerized tomographic (CT), Gastrointestinal (GI), Inflammatory bowel disease (IBD), Odds ratios (ORs), Statistical Package for the Social Sciences (SPSS).

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