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Real-life experience of colonic polyps' detection rate and adenoma detection rate with their characteristics in a cohort of Egyptian patients

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Abstract

Background Data on the prevalence of colonic polyps and adenomas in the Egyptian population are scarce. This study aimed to determine the prevalence of colonic polyps among Egyptian patients aged 50 years and older who underwent colonoscopy for a variety of reasons.

Patients and methods This study is a retrospective one that was conducted with the use of an endoscopic reporting database of patients presenting at Cairo University Hospital. The considered variables were age, gender, clinical presentation, polyps' characteristics, and diagnosis. Polyps were retrieved and sent for histopathological examination.

Results Among 4861 patients whose clinical presentation necessitated colonoscopic examination between 2012 and 2019, 850 consecutive patients aged 50 years and older were enrolled in this study. The median age was 65 ± 9 SD. The male gender was slightly predominant (50.8%). The polyp detection rate was 23.1%, while the adenoma detection rate was 14.7%, and they were mostly encountered on the left side of the colon. By regression analysis, the most important predictors of adenoma were age ≥ 65 years, diabetes, and the presence of a polyp in the right colon. Diabetics and older people (≥ 65 years) had two times increased risk for adenoma, while patients with polyps in the right side of the colon had 30 times increased risk of adenoma.

Conclusion PDR and ADR among the Egyptian population are matched to the target ADR set by the ASGE. We recommend ADR and PDR as key quality indicators of colonoscopy quality.

Keywords Colonoscopy, Colonic polyps, adenomas, Adenoma detection rate

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Introduction

Colorectal cancer (CRC) is the third most common cause of cancer-related death in Western countries [1]. Advanced adenoma and CRC increase with age; the incidence of colorectal polyps affects more than 10% of people aged more than 60 years worldwide, and ~30% of people aged 50 years and more in Western countries with slight male predominance [2].

The average period for an adenoma to carcinoma progression is around 10 years [3], and the risk of malignant transformation increases with the increasing size of the adenoma [4].

The majority of colorectal cancers develop from malignant transformations of adenomatous polyps [5]; subsequently, there is evidence that early detection and removal of polyps can prevent CRC [6].

It was reported that the incidence rate of cancer colon in Egypt is 2.7, while that of cancer rectum was 1.7 /100,000 population [7].

Colonoscopy is an important CRC screening tool, and the quality of colonoscopy is an essential determinant of its effectiveness in the prevention and reduction of mortality of CRC. Previous evidence denoted that for each 1% increase in the adenoma detection rate, a 3% decline in the risk of interval CRC ensues [8].

Till the current moment, no screening program has been established in Egypt. This could be due to multiple barriers at different levels. It has been addressed that socioeconomic status, lack of emphasis on prevention, fear, lack of confidence in providers to perform and interpret screening tests appropriately, and cost are the main barriers encountered.

The objectives of this study were to determine the polyps detection rate (PDR) and adenoma detection rate (ADR) to evaluate the clinical and histological features of colonic polyps in an Egyptian cohort study.

Materials and methods

This retrospective cohort study included 850 consecutive patients aged 50 years and older among 4861 patients who underwent colonoscopy for a variety of reasons at Cairo University Hospital from 2012 to 2019. Our institution's research ethical committee at Cairo University approved the study (N-218–2023), and all patients gave their informed written consent before inclusion in the study, according to the ethical guidelines of the 1975 Declaration of Helsinki. The recorded variables were age, gender, history of alcoholism or tobacco smoking, presentation, and the final diagnosis.

Exclusion criteria included age less than 50 years old, patients with unsatisfactory preparation or incomplete examination, and patients who were lost for follow-up.

In the colonoscopic procedure, colonoscopy was performed using high-definition scopes: Olympus scopes GIT 180, 170, and 190 with narrow-band imaging (NBI) modality. All the patients were subjected to written and verbal informed consent before the procedure. Bowel preparation using osmotic laxative as polyethylene glycol (PEG)-based electrolyte solution with split-dose preparation was advised to all patients. Printed instructions were given to and discussed with patients in advance.

Cecal intubation was achieved in patients with non-obstructing lesions while terminal ileal intubation was done when indicated. A thorough examination was carried out during the withdrawal of the scope. Description of the detected polyps was documented such as the site, size, and morphology. The lesions were classified according to size into ≤ 1 cm or > 1 cm. The site of lesions was reported as either proximal (cecum, ascending colon, and hepatic flexure) or distal (splenic flexure, descending colon, sigmoid colon, and rectum).

Paris classification was used to classify the colorectal polyps morphologically as follows [9]:

(1) Protruding lesions: more than 2.5 mm above the mucosal layer which is either pedunculated (0–Ip) or sessile (0–Is) (Figs. 1 and 2).

(2) Superficial lesions: which are either less than 2.5 mm above the mucosal layer (0–IIa) (Fig. 3), flat (0–IIb), or slightly depressed (0–IIc).

(3) Excavated (0–III).

Statistical analysis

Data management and analysis were performed using Statistical Package for Social Sciences (SPSS) vs. 28. Numerical data were summarized using means and standard deviations. Categorical data were summarized as numbers and percentages. Estimates of the frequency were done using the numbers and percentages. Numerical data were explored for normality using the Kolmogrov-Smirnov test and the Shapiro–Wilk test. Chi-square or Fisher's tests were used to compare the independent groups concerning categorical data, as appropriate. Comparisons between two groups for normally distributed numeric variables were done using the Student's *t*-test.

To measure the independent effect of different factors on the occurrence of adenoma and the presence of a polyp, factors that had a significance level of less than 0.10 were selected to enter into stepwise logistic regression analysis. Logistic regression was done to give an adjusted odds ratio and magnitude of the effect of different risk factors on adenoma. Odds ratio (OR) and 95% confidence interval (95% CI) were done also (95% CI that does not contain 1.0 is considered significant). All tests were two-tailed, and probability (p-value) ≤ 0.05 is considered significant.

Results

Demographics and clinical characteristics

All patients aged 50 years and older who underwent their first colonoscopy from 2012 to 2019 were included in this study. The study included 850 patients with a median age of 65 ± 9 SD. Male gender was slightly more predominant (50.8%) than female patients (49.2%). Non-steroidal anti-inflammatory drug (NSAID) intake was the most commonly encountered (8.6%) followed by smoking (5.4%) then alcohol intake (0.5%) (Table 1).

Hypertension was the most commonly encountered comorbid condition among the patients included (12.5%) followed by diabetes mellitus (8.6%) and ischemic heart disease (4.7%) (Table 1).

The main indications for colonoscopy were screening (asymptomatic adults aged 50 years and older and/or with a family history of CRC) in 55.5%, followed by evidence of blood loss (13.2%) and abdominal pain (10.2%) (Table 1). Evidence of blood loss included gross bleeding per rectum or microscopic as a positive fecal occult blood test (FOBT) and in cases of persistent iron deficiency anemia. Other indications included the following: weight loss (2.6%), radiological evidence of mass or thickening (2.1%), significant change in bowel habits either diarrhea or constipation collectively (0.8%), and Schebo (M2-PK Quick) test positive (0.5%) (Table 1).

The quality of colonic preparation according to the Boston scale was excellent to fair. Of the patients, 77.8% used PEG-3350, sodium sulfate, sodium chloride, potassium chloride, sodium ascorbate, and ascorbic acid for the preparation. The rest of the patients used Mg citrate, castor oil, or mannitol (Table 2).

Polyps were detected in 196 patients (23.1%); while, the adenoma was detected in 125 patients (14.7%).

Withdrawal time was not less than 10 min among all endoscopists.

Polyps and adenomas detection rates

Polyp detection rate (PDR) was defined as the presence of at least one polyp during colonoscopy. The polyp detection rate was found in 196 patients (23.1%) with slight male predominance (58.2%), and 41.8% were among females and most of them had single (67.3%) and small polyps (73%), respectively (Table 3).

Polyps' characterization

Most of the polyps were in the left colon (91.3%) followed by right colonic polyps (31.6%) and least for those having polyps in more than one site (23%) (Table 4).

The majority of the polyps were small which is defined by less than 1 cm in the maximum dimension

Table 1 Demographics and clinical characteristics ($n=850$)

Parameter	$N=850$ (100%)
Age (mean ± SD)	65 ± 9
Gender	
Male/female	432 (50.8%)/ 418 (49.2%)
Special habits	
Smoking	46 (5.4%)
Alcoholism	4 (0.5%)
History of NSAID intake	73 (8.6%)
Comorbidities	
DM	73 (8.6%)
Hypertension	106 (12.5%)
IHD	40 (4.7%)
Valvular HD	3 (0.4%)
Renal impairment	1 (0.1%)
Asthmatic	2 (0.2%)
Hypothyroidism	8 (0.9%)
Hyperthyroidism	1 (0.1%)
Presenting symptoms	
Screening	472 (55.5%)
Abdominal pain	87 (10.2%)
Bleeding per rectum	77 (9.1%)
Iron deficiency anemia	24 (2.8%)
Normocytic normochromic anemia	3 (0.4%)
Chronic constipation	33 (3.9%)
Chronic diarrhea	32 (3.8%)
Alternating bowel habits	7 (0.8%)
Dysentery	19 (2.2%)
Distension/flatulence	17 (2%)
Acute diarrhea	3 (0.4%)
Acute constipation	4 (0.5%)
Anal pain/ painful defecation	5 (0.6%)
For polypectomy	9 (1.1%)
Weight loss	22 (2.6%)
Radiological finding of mass/ thickening	18 (2.1%)
FOBT positivity	11 (1.3%)
Schebo (M2-PK Quick) positivity	4 (0.5%)
Follow-up post-colectomy	23 (2.7%)
Follow-up post-polypectomy	20 (2.4%)
Crohn's monitoring	2 (0.2%)
UC monitoring	28 (3.3%)

Table 2 Bowel preparation

Preparation used before colonoscopy	
Castor oil	78 (9.2%)
Mannitol	56 (6.5%)
Epimag	18 (2.11%)
Moviprep	661 (77.8%)
Laxil	37 (4.4%)

Table 3 Description of colonic polyps ($n=196$)

Polyps	*N* = 196	(23.1%)
Site	Anal verge	4 (2%)
	Anal canal	1 (0.5%)
	Rectal	33 (16.8%)
	Recto-sigmoid	8 (4.1%)
	Sigmoid	65 (33.2%)
	Descending	48 (24.5%)
	Splenic flexure	32 (16.3%)
	Transverse	14 (7.1%)
	Hepatic flexure	17 (8.7%)
	Ascending	28 (14.3%)
	Cecum	19 (9.7%)
	Ileocecal	1 (0.5%)
	Anastomotic line	1 (0.5%)
Number of polyps		
Single /multiple	132 (67.3%)/ 64 (32.7%)	
Size		
Small only (< 1 cm)	143 (73%)	
Large only (> 1 cm)	47 (24%)	
Variable-sized	35 (17.9%)	
Pathological type		
Adenoma	125 (14.7%)	
Adenocarcinoma	37 (4.4%)	
Hyperplastic	46 (5.4%)	
Degree of dysplasia in adenoma		
Low grade/ moderate/high grade	105 (12.4%)/ 2 (0.2%)/ 22 (2.6%)	

Table 4 Comparing site of polyps

196 (23.1%)	Site of polyp
62 (31.6%)	Rt colon
179 (91.3%)	Lt colon
45 (23%)	Both (Rt and Lt)

Table 5 Paris classification

Paris 1p	32 (16.3%)
Paris 1s	157 (80.1%)
Paris 0-IIa	2 (1%)
Paris 0-IIb	24 (12.2%)
Paris 0-III	5 (2.6%)

Fig. 1 Flat polyp in the descending colon (Paris classification IS)

(73%), while large polyps were detected in 24% and 17.9% found to have variable-sized polyps (Table 3).

As regards Paris classification, the majority of patients scored 1 s (80.1%) (Fig. 1), followed by 1p (16.3%) (Fig. 2), 0-IIb (12.2%), 0-III (2.6%), and 0-IIa (1%) (Fig. 3) (Table 5).

Adenoma was the most commonly encountered polyp (14.7%) followed by hyperplastic polyps (5.4%), while malignant polyps were 4.4% (Table 4). Low-grade dysplasia was encountered in 12.4% followed by high-grade

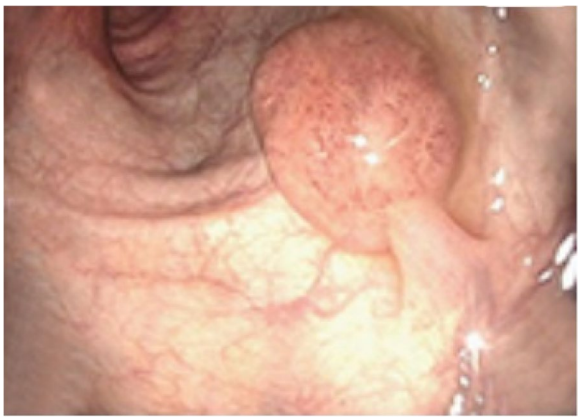

Fig. 2 Pedunculated polyp in the colon (Paris classification Ip)

Fig. 3 Flat colonic polyp (Paris classification 0-IIa)

dysplasia (2.6%) then a moderate degree of dysplasia (0.2%) (Table 4).

Adenoma detection rate (ADR) was defined as the presence of at least one adenoma proven by histopathological examination during colonoscopy. The adenoma detection rate was 14.7%, and they were mostly encountered in the left side of the colon (Table 4).

Predictors of the presence of polyp

Patients with polyps were older than others (mean age 67and 64, respectively), and about a quarter of males had polyps (26%), while less than 20% of females had polyps (Table 6).

About one-third of patients who were using NSAIDs had polyps (35.6%), while only 21.9% of patients who were not using NSAIDs had polyps (*P*-value 0.009). Near one-third of diabetics had polyps (32.9%), while only 22% of non-diabetics had polyps (Table 6).

We found that 10.8% of patients who came for screening had polyps (Table 6).

Table 6 Relation of different factors to the presence of polyp

	Polyp		*P*-value
	Yes	No	
	n = 196 (%)[a]	*n* = 654(%)[a]	
Sociodemographic characteristics			
Age			
Mean ± SD	67 ± 9	64 ± 9	< 0.001
Age groups			
< 65 years	81 (18)	368 (82)	< 0.001
≥ 65 years	115 (28.7)	286 (71.3)	
Sex			
Female	82 (19.6)	336 (80.4)	0.022
Male	114 (26.4)	318 (73.6)	
Special habits			
Smoking			
Yes	12 (26.1)	34 (73.9)	0.719
No	184 (22.9)	620 (77.1)	
NSAIDs			
Yes	26 (35.6)	47 (64.4)	0.009
No	170 (21.9)	607 (78.1	
Comorbidities			
DM			
Yes	24 (32.9)	49 (67.1)	0.042
No	172 (22.1)	605 (77.9)	
HTN			
Yes	33 (31.1)	73 (68.9)	0.037
No	163 (21.9)	581 (78.1)	
IHD			
Yes	15 (37.5)	25 (62.5)	0.034
No	181 (22.3)	629 (77.7)	
Complain			
Bleeding per rectum			
Yes	14 (18.2)	63 (81.8)	0.323
No	182 (23.5)	591 (76.5)	
Abdominal pain			
Yes	22 (25.3)	65 (74.7)	0.687
No	174 (22.8)	589 (77.2)	
Anemia micro hypo			
Yes	7 (29.2)	17 (70.8)	0.624
No	189 (22.9)	637 (77.1)	
Chronic constipation			
Yes	9 (27.3)	24 (72.7)	0.673
No	187 (22.9)	630 (77.1)	
Chronic diarrhea			
Yes	3 (9.4)	29 (90.6)	0.084
No	193 (23.6)	625 (76.4)	
Mucus in stool			
Yes	7 (36.8)	12 (63.2)	0.168
No	189 (22.7)	642 (77.3)	
Anal pain			
Yes	1 (20)	4 (80)	0.871

Table 6 (continued)

	Polyp		*P*-value
	Yes	No	
	n = 196 (%)[a]	*n* = 654(%)[a]	
No	195 (23.1)	650 (76.9)	
FOBTve			
Yes	4 (36.4)	7 (63.6)	0.472
No	192 (22.9)	647 (77.1)	
Loss of weight			
Yes	5 (22.7)	17 (77.3)	0.970
No	191 (23.1)	637 (76.9)	
Distension/flatulence			
Yes	3 (17.6)	14 (82.4)	0.775
No	193 (23.2)	640 (76.8)	
Radiological mass /thickening			
Yes	2 (11.1)	16 (88.9)	0.273
No	194 (23.3)	638 (76.7)	
Follow-up post-colectomy			
Yes	8 (34.8)	15 (65.2)	0.207
No	188 (22.7)	639 (77.3)	
Uc follow-up			
Yes	7 (25)	21 (75)	0.820
No	189 (23)	633 (77)	
Detection by screening			
Yes	51 (10.8)	421 (89.2)	< 0.001
No	145 (38.4)	233 (61.6)	

P-value < 0.05 is considered significant

[a] Percentages were calculated within row

Logistic regression for prediction of polyp

The most important predictors of polyp were age ≥ 65 years, male gender, and NSAID use. Older people (≥ 65 years) and NSAID users had nearly two times increased risk for polyp. Males had a 1.5 times increased risk of developing polyps than females (Table 7) (Fig. 4).

Table 7 The variables which were significant in the stepwise logistic regression in detection of polyp

P-value	95% C.I. for OR	OR	S.E	B	
< 0.001	1.3–2.4	1.8	0.17	0.57	**Age (≥ 65 Years)**
0.036	1.1–2	1.5	0.17	0.35	**Male gender**
0.034	1.1–3	1.8	0.26	0.56	**NSAID use**
< 0.001		0.18	0.16	− 1.7	**Constant**

NSAID non-steroidal anti-inflammatory drugs, *B* regression coefficient, *SE* standard error, *OR* odds ratio, *CI* confidence interval

P-value < 0.05 is considered significant

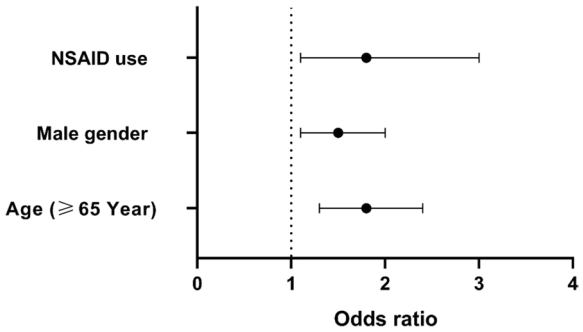

Fig. 4 Forest plot representing predictors of polyp

Predictors of the presence of adenoma

Patients with adenoma were older than those not having adenoma (mean age 68 and 64 respectively with *P*-value < 0.001); meanwhile, 17% of males had adenoma in comparison to only 12% of females (Table 8).

Also, it was found that about a quarter of patients using NSAIDs were having adenoma, while only 13.8% of patients who were not using NSAIDs had adenoma, and this difference was statistically significant (*P*-value 0.016) (Table 8).

Near a quarter of diabetic (24.7%) and hypertensive (21.7%) patients had adenoma (*P*-value 0.016 and 0.039, respectively); moreover, only 6.5% of patients complaining of bleeding per rectum had adenoma (Table 8).

The majority of patients with multiple polyps were adenomatous (76.6%); meanwhile, the majority of variable-sized polyps were adenomatous (91.4%) (Table 8). Most right-sided colonic polyps were adenoma (75.8%), and the majority of patients with both right and left colonic polyps were also adenomatous (77.8%) (Table 8).

Logistic regression for prediction of adenoma

The most important predictors of adenoma were age ≥ 65 years, diabetes, and the presence of a polyp in the right colon. Diabetics and older people (≥ 65 years) had two times increased risk for adenoma, while patients with polyps in the right side of the colon had 30 times increased risk of adenoma (Table 9) (Fig. 5).

Comparing RT and LT colonic polyps

We found that 17% of males had right colonic polyp, while only 3% of females had right colon polyp with *P*-value 0.008, and there was no difference between RT and LT colonic polyps regarding size of the polyp (Table 10).

Discussion

Colorectal cancer (CRC) is considered a preventable disease that is suitable for screening [10]. Colonoscopy is one of the major tools used for CRC screening and

Table 8 Relation of different factors to the presence of adenoma

	Adenoma		*P*-value
	Yes	No	
	n = 125 (%)[a]	*n* = 725 (%)[a]	
Sociodemographic characteristics			
Age			
Mean ± SD	68 ± 8	64 ± 9	< 0.001
Age groups			
< 65 years	49 (10.9)	400 (89.1)	< 0.001
≥ 65 years	76 (19)	325 (81)	
Sex			
Female	51 (12.2)	367 (87.8)	0.043
Male	74 (17.1)	358 (82.9)	
Special habits			
Smoker			
Yes	7 (15.2)	39 (84.8)	0.920
No	118 (14.7)	686 (85.3)	
NSAIDs			
Yes	18 (24.7)	55 (75.3)	0.016
No	107 (13.8)	670 (86.2)	
Comorbidities			
DM			
Yes	18 (24.7)	55 (75.3)	0.016
No	107(13.8)	670 (86.2)	
HTN			
Yes	23 (21.7)	83 (78.3)	0.039
No	102 (13.7)	642 (86.3)	
IHD			
Yes	10 (25)	30 (75)	0.068
No	115 (14.2)	695 (85.8)	
Site and size in relation to adenoma (among those who have polyp)			
No. of polyps (single vs multiple)			
Single	76 (57.6)	56 (42.4)	0.011
Multiple	49 (76.6)	15 (23.4)	
Small polyps			
Yes	86 (60.1)	57 (39.9)	0.095
No	39 (73.6)	14(26.4)	
Large polyps			
Yes	33 (70.2)	14 (29.8)	0.304
No	92 (61.7)	57 (38.3)	
Variable-sized polyps			
Yes	32 (91.4)	3 (8.6)	< 0.001
No	93(57.8)	68 (42.2)	
Site			
Right colon			
Yes	47 (75.8)	15 (24.2)	0.025
No	78 (58.2)	56 (41.8)	
Left colon			
Yes	113 (63.1)	66 (36.9)	0.608
No	12 (70.6)	5 (29.4)	
Both (right and left colon)			
Yes	35 (77.8)	10 (22.2)	0.033
No	90 (59.6)	61 (40.4)	

P-value < 0.05 is considered significant

[a] Percentages were calculated within row

Table 9 The variables which were significant in the stepwise logistic regression in detection of adenoma

P-value	95% C.I. for OR	OR	S.E	*B*	
< 0.001	16–57	30	0.33	3.4	**Right colon**
0.004	1.2–3	2	0.23	0.66	**Age (≥ 65 years)**
0.014	1.2–4.3	2.2	0.33	0.81	**DM**
< 0.001		0.07	0.19	− 2.7	**Constant**

P-value < 0.05 is considered significant

DM diabetes mellitus, *B* regression coefficient, *SE* standard error, *OR* odds ratio, *CI* confidence interval

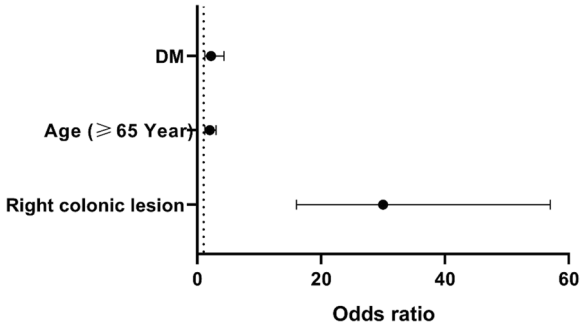

Fig. 5 Forest plot representing predictors of adenoma

subsequent removal of premalignant colorectal lesions (CLs) that have been shown to prevent CRC [11].

The target of colonoscopy is not only consistent with the detection of early cancer but also polyp detection and removal. Subsequently, colonoscopy as a screening tool aims to decrease the incidence of CRC. Most of the CRCs are adenocarcinoma (> 95%), and it is widely accepted that they arise from the progression of adenomatous polyps to invasive malignancy, adenoma-carcinoma sequence [12].

The effectiveness of colonoscopy in reducing CRC risk is dependent on the ability of the endoscopist to detect and remove adenomatous polyps. Polyp detection rate (PDR) has been adopted as a surrogate marker for adenoma detection rate (ADR) [13].

The current study was performed on 850 Egyptian patients aged 50 years and older among 4861 patients who underwent colonoscopic examination in a high-volume tertiary center with experienced endoscopists and a dedicated pathologist for CR polyps that aimed to determine PDR and ADR to evaluate the clinical and histological features of colonic polyps.

The majority of the detected polyps in our study were small (< 1 cm) (73%), adenomatous (14.7%), and mostly located in the left colon (91.3%) and were classified as Paris Is in 80.1%; those findings agree with other studies that reported an increased incidence of adenomatous

Table 10 Characteristics of patients with right versus left colonic polyps

	Lt colon *n* (%)[a]	Rt colon *n* (%)[a]	*P*-value
Age			
Mean ± SD	67 ± 9	68 ± 10	0.801
Age group			
< 65 years	53 (88.3)	7 (11.7)	0.897
≥ 65 years	81 (89)	10 (11)	
Sex			
Female	61 (96.8)	2 (3.2)	0.008
Male	73 (83)	15 (17)	
No. of polyps (single vs multiple)			
Single	97 (86.6)	15 (13.4)	0.240
Multiple	37 (94.9)	2 (5.1)	
Small polyps			
Yes	97 (87.4)	14 (12.6)	0.412
No	37 (92.5)	3 (7.5)	
Large polyps			
Yes	34 (97.1)	1 (2.9)	0.123
No	100 (86.2)	16 (13.8)	
Variable-sized polyps			
Yes	16 (88.9)	2 (11.1)	0.983
No	118 (88.7)	15 (11.3)	

P-value < 0.05 is considered significant

[a] Percentages were calculated within row

polyps in the left colon as Marwa A. et al. [2] and Zare-Mirzaie A. et al. [14].

ADR is defined as the percentage of average-risk screening colonoscopies in which one or more conventional adenomas are detected. Several factors affect the ADR, for example, the use of high-definition scopes, good preparation, experienced endoscopists, adequate withdrawal time, and cecal intubation [15]. However, ADR is not readily available from colonoscopy reports, as it requires the integration of endoscopy and pathology records [16].

Moreover, it ignores the serrated polyp pathway, increasingly recognized as a precursor for CRC development [17]; that is why PDR had been proposed as a more feasible and practical marker for ADR [18].

PDR is defined as the proportion of screening colonoscopy procedures in which at least one polyp is removed. PDR has the advantage of simple calculation from colonoscopy reports and was shown to correlate well with ADR in several studies.

Data from Egypt and the MENA region about this issue is scarce and needs more clarification. It is believed that this data could add a lot to the literature based on the different racial, habitual, and environmental factors.

ADR and PDR are proposed as major quality measures presently for monitoring endoscopists' performance [11].

In the current study, we present a rather different situation as all our patients who underwent colonoscopies had definite indications besides screening for malignancies. Most of the polyps encountered were adenomas, and our PDR was 23.1% with slight male predominance (58.2% were among females, and 41.8% were among males), and ADR was 14.7% which is matched to the target ADR as set by the ASGE (> 30% for males and > 20% for females).

Logistic regression analysis for predictors of adenoma was age ≥ 65 years, diabetes, and the presence of a polyp in the right colon. Diabetics and older people (≥ 65 years) had two times increased risk for adenoma, while patients with polyps in the right side of the colon had 30 times increased risk of adenoma.

The inverse relation between ADR and CRC risk and mortality emphasizes the importance of performing standard colonoscopies [19]. However, the standards could be tailored according to the target population.

Some published data reported that the use of NSAID drugs has been associated with reduced risk for colorectal cancer and adenomatous polyps in both animal and human studies 20; that is contradictory to our study that showed that about one-third of our patients who were using NSAIDs had polyps (35.6%); we think a large scale of studies is still needed to confirm the exact relationship between the use of NSAIDs and colonic polyps.

The strengths of our study are the high number of participants involved, as well as the inclusion of multiple different indications reflecting our real-world practice, while the main limitations were not including the exact withdrawal time and unavailable follow-up course data.

Conclusion

Access to CRC screening is an important key to reducing the burden of CRC, but unfortunately, this program is not implemented in many countries including Egypt.

PDR and ADR among the Egyptian population are matched to the target ADR as set by the ASGE. However, further studies are still needed to identify the real state of CR polyps and cancers among the Egyptian population.

Recommendations

We recommend routine, meticulous evaluation of the colon for the presence of polyps to improve the quality measures for colonoscopy such as adenoma detection rate (ADR) that has been proposed to be surveilled to ensure minimum standards.

Abbreviations

ADR	Adenoma detection rate
PDR	Polyps detection rate
CRC	Colorectal cancer
NBI	Narrow-band imaging
PEG	Polyethylene glycol
OR	Odds ratio
NSAIDs	Non-steroidal anti-inflammatory drugs

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Authors' contributions
MN contributed towards data acquisition, endoscopy, reviewing the manuscript, and supervision of the research; MS contributed towards data acquisition, endoscopy, and drafting of the manuscript; SE, HH, DA, ZA, and AK contributed to writing the methodology and results analysis; Abdellatif A and AM edited the manuscript; HI, OM, MH, and AE contributed towards data acquisition, analysis, and interpretation; all authors approved the final version of the manuscript, and each author believes that the manuscript represents honest work.

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Availability of data and material
Not applicable.

Declarations

Ethics approval and consent to participate
Our institution's research ethical committee at Cairo University approved the study (N-218–2023), and all patients gave their informed written consent before inclusion in the study, according to the ethical guidelines of the 1975 Declaration of Helsinki.

Consent for publication
Oral and written informed consents were obtained from the patients or from their eligible relatives.

Competing interests
The authors declare that they have no competing interests.

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We confirm that this work is original and has not been published elsewhere, nor it is currently under consideration for publication elsewhere.

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