



Detection Rate of Colorectal Polyps in Symptomatic Candidates of Colonoscopy: When Should We Do a Total Colonoscopy?

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ABSTRACT

BACKGROUND

The incidence of colorectal cancer is increasing in the northeast of Iran. Colorectal polyps are among the proposed risk factors noted, especially in the elder population. This study was designed to study the diagnosed cases of intestinal polyps detected from 2011 to 2016 in the northeast of Iran.

METHODS

The population consisted of symptomatic candidates referred to the colonoscopy center in Gorgan city. Based on the available colonoscopy and pathology reports, 1706 cases were enrolled after the exclusion of cases without sufficient data.

RESULTS

Among 1709 (55.5% males and 44.5% females) cases, 1405 cases with 1912 polyps were detected. Among them, 345 (25%) aged less than 50 years. Tubular adenoma (N = 826, 43.2%) and hyperplastic polyps (N = 519, 27.1%) were the top two histological findings. Out of 1405 patients with polyps, 660 (39.6%) polyps were detected in proximal colon (15.6% in proximal and 24% in both proximal and distal). Malignancies were detected in 13.2% (0.8% malignant polyps and 12.4% malignant masses).

CONCLUSION

A considerable number of colorectal adenomas in proximal colon and in patients younger than 50 years old, suggesting to schedule colorectal cancer screening from at least 10 years younger and continuing colonoscopy up to the proximal area.

KEYWORDS:

Adenomatous polyps, Colonoscopy, Colorectal cancer, Intestinal polyps

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INTRODUCTION

According to statistics, the incidence of colorectal cancer (CRC) has increased significantly in Golestan and Iran, and its distribution tends to be higher in younger ages.¹⁻⁵ Based on studies in Golestan province, age standardized rate (ASR) for men



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(14.8) is higher than for women (11.5).⁶ According to world-wide statistics, CRC is the third most common cancer and the second leading cause of death, killing about 700,000 patients annually, making it a global issue. GLOBOCAN reported more than 1.8 million new cases of CRC and 881,000 deaths in 2018. It is also estimated that the global incidence of CRC will increase by 60% to more than 2.2 million new cases and 1.1 million deaths by 2030.^{6,7}

CRC has different incidences around the world, but areas including Europe (Hungary, Slovenia, Slovakia, the Netherlands, Norway), Australia/New Zealand, North America, and East Asia (Japan, Republic of Korea, Singapore) have the highest incidence rates.⁸ The incidence of the disease can be attributed to the socio-economic progression that is higher in developing countries.⁸⁻¹⁰ Different risk factors have been identified for this cancer, such as age, genetics, lifestyle, low physical activity, alcohol consumption, low fiber intake, and diet.^{6,7,10-12}

Colonic polyps are caused by the slow but excessive growth of intestinal mucosa cells. Most of these polyps are benign, but in some cases, they become malignant (< 1%) and are usually fatal because they are detected in the late phases. Because of the high prevalence of colorectal polyps (especially with respect to aging), they are considered and removed as a prognostic factor for CRC.¹³

Screening methods to diagnose and evaluate the prognosis of colorectal adenoma and CRC can reduce mortality by up to 60%.^{2,4,14}

The gold standard method for screening is colonoscopy, which is shown to reduce the risk of CRC deaths due to the removal of polyps (polypectomy) prior to cancer. But this ability to reduce the CRC risk through recommended screening colonoscopy for all average-risk, asymptomatic adults depends on the ability of gastroenterologists to detect and remove adenomatous polyps.^{15,16,17}

Considering the increasing incidence of CRC in recent years, we aimed to provide a baseline study of the diagnosed cases of intestinal polyps detected from 2011 to 2016 and some related factors for future studies.

MATERIALS AND METHODS

Study Design

Golestan Research Center of Gastroenterology and Hepatology (GRCGH) conducted the present cross-

sectional study in Sayyad-e-Shirazi Hospital in Gorgan, Golestan province in northeast of Iran, from April 2011 to April 2016.

Ethical consideration

The study protocol was approved by the local Ethics Committee of Golestan University of Medical Sciences (IR.GOUMS.rec.1396.161). Written informed consent was taken from all candidates, and a colonoscopy session was scheduled if there was no contraindication.

Study Population

The study population consisted of patients who were a candidate for colonoscopy. Based on the available colonoscopy and pathology reports, 1706 cases were enrolled in the study after excluding cases without sufficient data and those diagnosed as CRC or follow-ups for it.

Demographic data (age, sex, residency site) were retrieved from medical records. The data on the number and location of polyps were extracted from colonoscopy reports. Where multiple polyps were recorded, the most advanced/important one was taken into account. Histopathological data were collected from pathology reports.

Procedures and Definitions

Seven gastroenterologists with at least 5 years of experience of colonoscopy in the university hospitals and three expert gastrointestinal pathologists collaborated in this study that had been part of many research projects.

Written instruction on using polyethylene glycol had been given to patients for bowel preparation 24 h before the procedure, along with a low-residue diet. During the procedure, the participants were sedated with midazolam. Pethidine was also used when necessary.

Bowel preparation was classified as good, fair, or poor using the Ottawa Bowel Preparation Scale that assesses three components of the large intestine: the rectosigmoid colon, the mid colon, and the right colon. A score of 0 was given if the bowel preparation was excellent, with visible mucosal details and no fluid and almost no stool. The maximum score was 4, given if the bowel preparation was inadequate, and obscured mucosa by stool despite major washing/suctioning. The total score was calculated by adding up all scores throughout the three areas. The scale has a range from 0 (perfect) to 14 (solid stool in

Table 1: Basic characteristics of the colonoscopy candidates

Year of colonoscopy performance	Numbers (%)
2011	88 (5.1)
2012	269 (15.7)
2013	241 (14.1)
2014	315 (18.4)
2015	399 (23.3)
2016	397 (23.2)
Total	1709 (100)
Age (year)	
< 40	189 (11)
40-50	250 (14.92)
> 50	1236 (73.8)
Total	1675 (100)
Sex	
Male	759 (44.5)
Female	948 (55.5)
Total	1707 (100)
Colonoscopy findings	
Polyp	1405 (78.8)
Lesions other than polyp	101 (5.6)
Mass	276 (15.4)
Number of polyps in each case	
≤ 2	1295 (92.2)
> 2	110 (7.8)
Total	1405 (100)

each section and lots of fluid, i.e., a completely unprepared colon).¹⁸

A second session colonoscopy had been scheduled for those with poor bowel preparation. Those with good or fair bowel preparation were included in the final analysis. All polypoid lesions were removed for further histopathological evaluation.

The classification of the histological findings of polyps included: tubular adenoma, tubulovillous polyps, villous adenomatous, serrated adenomas, hyperplastic juvenile polyps, and adenocarcinoma.¹⁹ The classification of the histological findings of masses included: malignant masses and benign masses.

The location of colorectal lesions was divided into three classes: proximal (includes: ascending colon and transverse colon), distal (includes: descending colon and rectosigmoid colon), and both. Cases were categorized into three age groups: less than 40, between 40 and 50, and more than 50 years. Considering the numbers of detected

polyps in each colonoscopy, cases were divided into two groups: One or two polyps and more than two polyps. The analyses were performed using SPSS software version 16, using Chi-square test.

RESULTS

During 6 years of study, 1709 colonoscopies were performed in the hospital (mean [SD] age of 57.65 [14] years), consisted of 759 (44.5%) men. Basic demographic data are shown in table 1.

Colorectal polyps were reported in 1405 cases, lesions other than polyps were detected in 101 (5.6%), and in 276 (15.4%) cases, a mass was found in colonoscopy. Among 1912 reported polyps (110 cases had more than two polyps), 374 (19.6%) were hyperplastic polyps, 556 (29.1%) were tubular adenoma, and 14 (0.7%) were adenocarcinoma. Most of the adenocarcinomas were seen in men (64.3%). (Table 2)

A mass was detected in 276 cases (59.4% men), and 212 of them were malignant (Table 3).

There were no significant differences between men and women in regards to the polyps' detection rate ($p = 0.759$).

Among 1405 persons with polyps, location of lesion and age group were reported in the records for 1357, showing a significant relationship. As seen in table 4 the distal of the colon was the most frequent location of the lesion in both age groups (younger than 50 years and the elder ones), but there was a trend toward the involvement of both distal and proximal sites of the colon in elder people ($p = 0.00$) (table 4).

There was a significant relationship between the age group and histopathology of polyps ($p = 0.00$). In younger patients, age group less than 50 years old, hyperplastic polyps were seen in 43% but in elder people, there was a lower incidence and was seen in 28% and tubular adenoma (50%) and multiple (10%) histopathologies were higher compared with the younger ones.

DISCUSSION

In this hospital-based study on colonoscopy candidates referred to the colonoscopy ward of our academic hospital in northeast of Iran during a 6-year period, among 1709 cases, in 1405 cases 1912 polyps were detected. Tubular adenoma (34.6%) and hyperplastic polyps (19.6%) were the top two among the histological findings. Out of 1405

Table 2: Basic characteristics of cases with polyp

Variables	Number (%)
Sex*	Female 619 (44.1)
	Male 785 (55.9)
Age groups (years)	Less than 40 141 (10.2)
	40 to 50 204 (14.8)
	More than 50 1035 (75.6)
Location of polyps	Proximal 260 (15.6)
	Distal 1009 (60.5)
	Both 400 (24)
Histopathologic diagnosis	
Adenoma	Tubular adenoma 826 (43.2)
	Villous adenoma 77 (4)
	Tubulovillous adenoma 47 (2.46)
	Hyperplastic 519 (27.14)
	Serrated adenomas 31 (1.62)
	Adenocarcinoma 24 (1.25)
	Others** 388 (20.29)
Numbers of polyps per person	1-2 1295 (92.2)
	>2 110 (7.8)

*person with polyp

**Other: more than one type of the polyps

persons with polyps, 41.7% had polyps in the proximal colon (14.3% in proximal and 27.4% in both proximal and distal). Malignancies were detected in 13.2%, including 0.8% malignancy in polypoid lesions and 12.4% in masses other than polyps.

There are controversial reports about the prevalence of colorectal adenomas in the asymptomatic population (in screening programs) varying from 8% to 12% (Hemmasi: 11.2%, Forsberg: 10%, Imeriale: 8.7%)²⁰⁻²² while it is as high as 60% in symptomatic patients who were a candidate for colonoscopy (Laird-Fick: 59%, Han Wang: 58.8%).^{23,24} So, the age of the studied population and the reason for colonoscopy are the most important variables affecting the prevalence of detected adenoma in different reports.

According to the population age, previous studies could be classified into two groups: first group as screening programs in high-risk population (age \geq 50 years),²³ and the second group consisted of cases under the proposed screening age (40-49 years).^{21, 22}

Table 3: Basic characteristics of cases with colorectal masses

Variables	Numbers (%)
Sex*	
Female	122 (44.2)
Male	154 (55.8)
Age groups (years)	
Less than 40	34 (12.5)
40 to 50	49 (18.1)
More than 50	188 (69.4)
Location	
Proximal	55 (19.9)
Distal	165 (59.8)
Both	56 (20.3)
Pathologic diagnosis	
Malignancy	212 (76.81)
Benign tumors	64 (23.19)

*person with mass

In an Iranian study, the prevalence of adenoma (advanced and non-advanced) has been reported 11.7% (39/333) in age group of 40-49 years, which is lower than in Asian developing countries. There was also the report of four advanced adenomas that were lower than other previous reports.²¹

In the present study, adenocarcinoma was reported in 24 polypoid lesions out of 1405 (1.7%), which was very different from previous studies in both symptomatic and non-symptomatic patients. Laird-Fick and colleagues reported adenocarcinoma in 22 (0.2%) cases older than 50 years candidate of colonoscopy.²³ There was no report of adenocarcinoma in other similar studies that may be the result of exclusion criteria they implied, such as the exclusion of cases with a family history of CRC or inflammatory bowel diseases (IBD).

Broff and co-workers, in a study in USA (2017), reported an adenoma detection rate of 37% and a polyp detection rate of 55% in candidates of colonoscopies with different indications from screening to symptomatic patients. They noticed that in all indications, adenoma was detected more in the proximal colon compared with the distal segment and suggested paying more attention to continuing the colonoscopy up to the proximal colon, regardless of the reason for colonoscopy.¹⁵

In another study by Murphy and others (2020), among 2964 colonoscopies performed for different reasons, adenoma was detected in 19% and polyps in 27%, although they did not report the exact segment where they were detected.²⁴

Table 4: Comparing the location of the detected polyps regards the age groups

Table 1. Comparing the location of the affected polypropylene among groups					
Variables		Location			Total
		Distal	Both	Proximal	
Age group	Less than 50 years old	239 (71.6)	50 (15)	45 (13.5)	334 (100)
	More than 50 years old	549 (53.7)	325 (31.8)	149 (14.6)	1023 (100)
Total		788 (58.1)	375 (27.6)	194 (14.3)	1357 (100)

Our studied population is different from others as it consisted of symptomatic candidates for colonoscopy due to suspicious clinical presentations (moderate to high-risk population) but we focused on detected colorectal polyps, which were comparably higher than other previous studies.

Although there are some studies like the one done by Abu Baker and colleagues (2019) that compared the polyp detection rate between screening colonoscopy and symptomatic patients, which showed a similar rate except for those presented with positive fecal occult blood,²⁵ they did not report the segment or adenoma detection rate, as we reported.

There has been a general agreement that there is a 10-year time lag between the primary diagnosis of colorectal adenoma and progression to colorectal cancer, so it has been suggested to perform a colonoscopy in an average and high-risk population in 50-year-olds and older. Sedentary life and industrialization have had a significant effect on the increasing prevalence of CRC in Eastern countries like Iran. Statistics showed an increased prevalence of CRC in Golestan province, northeast of Iran, especially in the younger population.⁶ Also, the present study showed a remarkable rate of 25% colorectal polyps in the 40- to 50-year age groups, which was similar in the second-class studies, notifying an alarm to think more about the risk of CRC at a younger age. So, it seems necessary to consider screening programs in residences of this area in even a decade younger age population because age is not the only important factor here.

Guidelines suggest performing a distal colonoscopy (recto-sigmoidoscopy) in screening programs. But as the present results showed, 41.7% of polyps were detected in the proximal colon, which is a large number. Some previous studies reported a considerable prevalence of adenomas located in the proximal colon (Laird-Fick: 58.3%, Forsberg: 36%, Han Wang: 40%).^{20, 23, 26} According to reports, continuing colonoscopy to the proximal colon (that

is out of reach of sigmoidoscopy) may detect more lesions and leads to a better diagnosis and intervention.

Previous studies reported hyperplastic polyps as the most histopathological finding (10-21%) among the normal population (Forsberg: 21%, Imperiale: 10%).^{20, 22-24} But adenomas were the most prevalent ones in studies performed on symptomatic populations, as reported by Han Wang (58.8%), and Laird-Fick (59%).^{23, 26}

In the present study, tubular adenomas were the most common one (34.6%) in colonoscopy candidates overall. But in patients younger than 50 years old, hyperplastic polyps were the most common histological type (43%), and in elderly people, tubular adenoma was the most common one (50%).

It seems that histopathology differs in various age groups, and there is a trend toward the more frightening type of polyps, tubular adenoma, by increasing age. However, in the younger population, hyperplastic polyps were the most common type of polyps.

Limitation and strength

This study consisted of remarkable sample size, greater than any previous ones implemented in Iran, and described the histopathological findings in detail. But there were limitations such as limited access to colonoscopy reports and insufficient data about the size of the lesions. Besides, demographic data, including residency and ethnicity situations, were missing in some cases.

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ETHICAL APPROVAL

There is nothing to be declared.

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.

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