

## Male gender is a risk factor for high-risk colorectal polyps

Risk factors for high-risk colorectal polyps

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### Abstract

**Aim:** Almost all colorectal cancers originate from polyps. Polyps are divided into two groups: neoplastic and non-neoplastic. The most commonly detected polyps are adenomatous polyps, and some of them have a high risk of malignancy. In our study, we aimed to investigate the effect of age and gender on high-risk colorectal polyps.

**Material and Methods:** We retrospectively reviewed the colonoscopy procedures performed in our Endoscopy Unit between January 2018 and January 2022. Demographic information of patients and colonoscopy reports were re-examined from the hospital information system.

**Results:** In 1474 colonoscopy procedures, 289 polyps were detected in a total of 204 (13.8%) patients. 61.7% of the patients were male and 38.3% were female. The age range in which polyps were detected most frequently was 60-69 years (28%). There were more polyps in the distal colon than in the proximal. In the histopathological examination, 50.95% of the polyps were adenomatous polyps, followed by hyperplastic polyps with 46%. 20% of the patients had high-risk polyps. High-risk adenomas were statistically significantly higher in men than in women ( $p=0.026$ ).

**Discussion:** High-risk adenomas are more common in men. Colon cancer mostly consists of polyps. For this reason, we believe that men should be insisted and encouraged for more screening.

### Keywords

High-risk Colorectal Polyps, Colorectal Cancer, Male Gender

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## Introduction

All formations in the gastrointestinal tract with or without stems, small or large, with or without stems from the epithelium to the lumen, with regular or irregular borders, are called polyps. They are often symptom-free and sometimes present with symptoms of hemorrhage, abdominal pain and obstruction [1]. Polyps are important because they are precursor lesions of colorectal cancers (CRC). Colorectal cancers are a deadly type of cancer that is detected second in women and third in men among all cancers [2].

Colorectal polyps are divided into two main groups: Neoplastic polyps and non-neoplastic polyps. Non-neoplastic polyps include hyperplastic polyps, inflammatory polyps, mucosal polyps, juvenile polyps and Peutz-Jeghers polyps [3].

Hyperplastic polyps are the most common type of non-neoplastic polyps in the colon [4]. They usually appear in the distal colon and resemble adenomatous polyps in appearance. They are usually sessile and diminutive in nature and rarely exceed 10 mm [5,6].

Neoplastic polyps have the potential to become cancerous and have two main types: adenomatous polyps and sessile serrated polyps. Adenomatous polyps are precancerous lesions originating from the colon epithelium. Adenomatous polyps constitute 85-90% of the polyps that evolve into cancer. However, approximately 10% of all adenomatous polyps turn into cancer, and this process requires at least 7-10 years [7]. Adenomatous polyps are classified according to their histopathological features as tubular, villous and tubulovillous [3]. Histology of the adenoma for cancerization (villous structure, severity of dysplasia), size of 10 mm and above, and three or more are the most important factors determining the risk [8]. In our study, we aimed to investigate the effect of age and gender on high-risk colorectal polyps.

## Material and Methods

The study included a retrospective single-center examination of patients who underwent colonoscopy for any reason in the endoscopy unit of our hospital between January 2018 and January 2022. The study followed Helsinki Declaration Principles and local ethics committee approval Konya Medica Hospital Ethics Committee Date:28.01.2022, Number: 2022/01 was obtained.

For colonoscopy, colon cleansing was performed by giving oral 500 ml sennoside solution and rectal 210 ml sodium phosphate enema after a watery diet 48 hours before the procedure. After the patients gave their consent by reading the procedure information form, it was performed by a single gastroenterologist with Fujifilm EC760-R colonoscope (Fujifilm Medical Systems Inc., Tokyo, Japan) accompanied by sedation with midazolam, fentanyl and propofol. Detected polyps were excised by forceps, snare or endoscopic mucosal resection and then sent to the pathology laboratory in solution with formaldehyde.

Demographic information of patients and colonoscopy reports were re-examined from the hospital information system. Demographic information such as age, gender and disease history of the patients were recorded. According to colonoscopy

reports, the location of the polyps was divided into the rectum, sigmoid colon, descending colon, transverse colon, ascending colon and cecum. The number of polyps in each region, the size of the polyps and the histopathological features of the polyps were recorded in the registration form. Histopathologically, polyps with any of the following three criteria were included in the high-risk group (3):

- i. adenoma size  $\geq 10$  mm,
- ii. prominent villous component,
- iii. high-grade dysplasia,
- iv. number of adenomas  $\geq 3$ .

Criteria for exclusion from the study were inflammatory bowel disease, familial polyposis syndrome and the presence of colon cancer.

Data were statistically analyzed using SPSS 22.0 for Windows program (IBM Corp. Armonk, NY, USA) and were presented as average, percentage and standard deviation. The Chi-Square test was used for statistical significance between age, gender and risky polyps.

## Ethical Approval

Ethics Committee approval for the study was obtained.

## Results

The files of 1503 patients who underwent colonoscopy were retrospectively scanned. After excluding 27 (1.8%) patients with adenocarcinoma, 1 (0.07%) patient with familial adenomatous polyposis (FAP) and 1 (0.07%) patient with attenuated FAP were excluded from the study; a total of 289 polyps were analyzed in 204 (13.8%) of the remaining 1474 patients. The most common indication for colonoscopy was constipation (27%) (Table 1). The youngest of the patients with polyps was 31 years old, the oldest was 89 years old, and the median age was 62 years; 79 (38.7%) patients were female with the median age of 62 (32-88) years, while 125 (61.3%) were male with the median age of 62 (31-89) years. 80% of the patients with polyps were over 50 years of age, and the most common age range with polyps was 60-69 (28%) and at least 30-39 (4.4%) years of age (Figure 1). When the polyps were evaluated according to their size, 221 (76.5%) were  $\leq 5$  mm, 38 (13.1%) were 6-9 mm, 20 (6.9%) were 10-20 mm and 10 (3.5%) were  $\geq 20$  mm (Figure 2). Of the 204 patients included in the study, 132 (64.7%) had a single polyp and 72 (35.3%) had more than one polyp. When the polyps were evaluated according to their localization, most polyps were in the rectosigmoid region (48.5%) and the least in the cecum (5.5%). According to their histopathological features, adenomatous polyps were detected with a maximum of 147 (50.95%) units, followed by hyperplastic polyps with 133 (46%) units (Table 2). Hyperplastic polyps were significantly larger on the left side than on the right side. When polyps were classified according to their risk, a total of 41 (20%) patients were in the high-risk polyp group and 163 (80%) patients were in the low-risk group. The median age of high-risk patients was 69 years, while the median age of low-risk patients was 59 years. There was no statistically significant difference between the two groups in terms of age ( $p=0.101$ ). High-risk polyps were present in 32 (27%) of men and 9 (13.9%) of women. High-risk polyps were statistically significantly higher in men than in women ( $p=0.026$ ) (Figure 3).

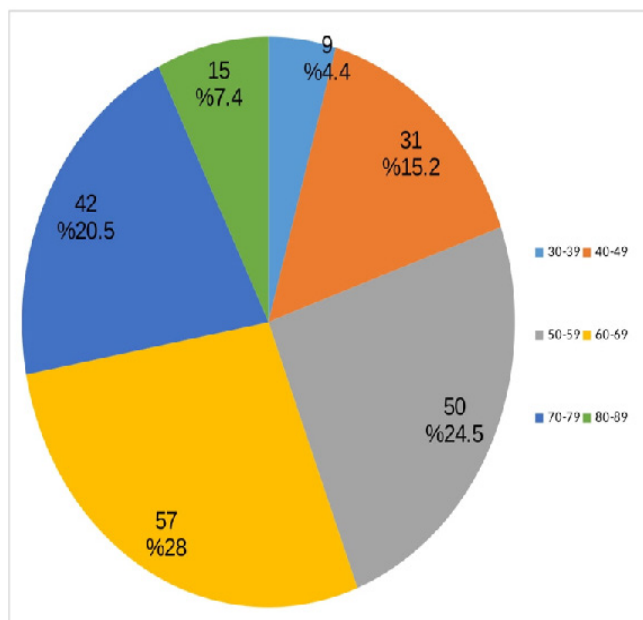


Figure 1. Distribution of polyps by age.

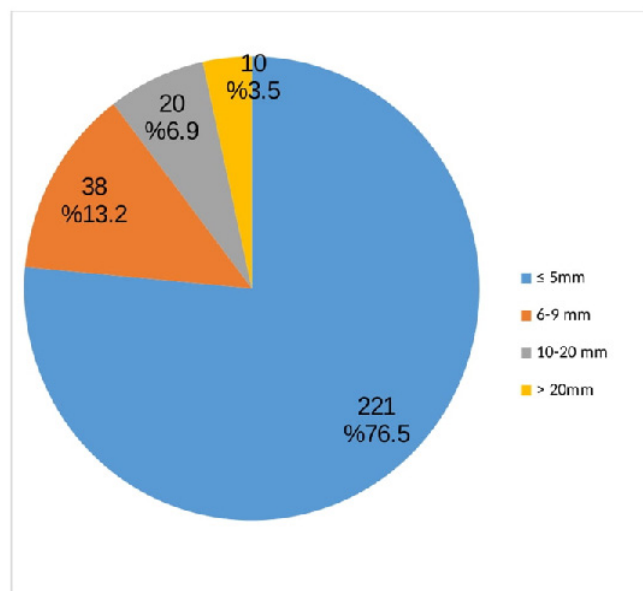


Figure 2. Distribution of polyps by size

Table 1. Colonoscopy indications

Indication	Number of patients (n)	%
Constipation	55	27
Rectal bleeding	42	20.6
Chronic diarrhea	10	4.9
Chronic abdominal pain	32	15.7
OBS(+)	21	10.3
Family colon tumor	7	3.4
Swelling	16	7.8
Anemia	21	10.3
Total	204	100

OBS: occult blood in stool

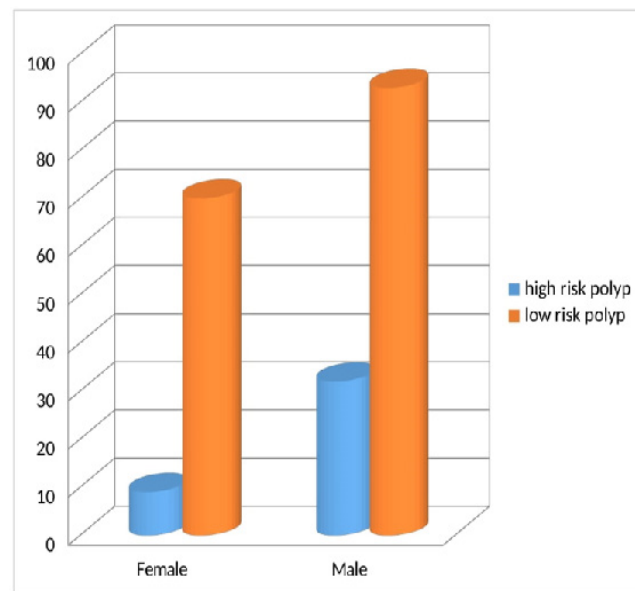


Figure 3. Distribution of polyps by risk

Table 2. Localization and histopathological results of polyps.

		Cecum	Right colon	Transvescolon	Left colon	Sigma colon	Rectum	Total	
								N	%
Tubular adenoma		5	18	38	10	31	26	128	44.3
Tubulovillous adenoma		3	3	3	1	2	6	18	6.3
Villous adenoma		-	-	1	-	-	-	1	0.35
Hyperplastic polyp		6	13	29	14	37	34	133	46
Inflammatory polyp					1			1	0.35
Serrated adenoma		0	0	0	1	2	2	5	1.7
Lipoma		2	1					3	1
Total	N	16	35	71	27	72	68	289	100
	%	5.5	12.1	24.6	9.3	25	23.5		

## Discussion

The most important finding of this study is that high-risk polyps are more common in men than women.

Most colorectal polyps are adenomatous polyps from the group of neoplastic polyps and constitute approximately 70% of all colon polyps [3]. Colonic adenomas are typically asymptomatic and are most commonly found through imaging studies of the colorectal for other causes [9]. Adenomas are classified according to their shape as sessile, pedunculated, or flat [3]. Histologically, they are classified according to their pattern as tubular, villous, or tubulovillous [1]. An adenoma is considered villous if it has at least 75% villous structure, tubular if it has <25% villous structure, and tubulovillous if it is between the two (25-75% villous architecture) [3]. The risk of malignancy increases from the tubular structure to the villous structure. In general, the size of an adenoma is related to the histological type, the larger the villous structure, the larger the polyp. Tubular adenomas are usually stalked, while villous adenomas are usually sessile [3]. Although the prevalence of adenomatous polyps varies, especially advanced age is known as a major risk factor. In addition, male gender, race and abdominal obesity are also considered risk factors for adenomatous polyps [1]. In our study, 50.95% of the polyps we resected were adenomatous polyps. This rate was lower than in the literature. We think that the reason for our relatively low rate of adenomatous polyps is related to our high rate of hyperplastic polyps. We do not know the reason for the high hyperplastic rate. However, most of these polyps are of diminutive size [5,6]. When the colon is completely swollen by air insufflation during a colonoscopy, this tends to flatten or press on hyperplastic polyps, making it difficult to detect hyperplastic polyps [10]. The adequate colon cleansing of our patients and the fact that the procedures are performed in accordance with the guidelines with at least 7 minutes of withdrawal time with a high-definition colonoscope may have enabled us to notice very small lesions in the colon. We believe that our high detection of hyperplastic polyp ratio may be related to these parameters.

The cancerous potential of adenomas is related to the size, type and degree of dysplasia of the polyp, and the number of polyps. Adenomas are classified as high-risk or low-risk according to the presence of these features [3]. These high-risk adenomas have a higher risk of becoming cancerous than other adenomas. The presence of advanced adenoma in the distal colon was associated with an approximately 5-fold higher rate of metachronous proximal colon cancer than in the general population [9]. Most colorectal cancers occurring within 5 years after polypectomy are thought to develop because high-risk adenomas cannot be identified or completely removed during the first colonoscopy [11]. High-grade dysplasia has the highest risk of becoming cancerous, with an annual rate of 37%, followed by the presence of a villous component at a rate of 17% [12]. Adenomas larger than 10 mm in diameter have the potential to contain cancer and carry a risk of metachronous cancer [13], and a size of at least 10 mm provides a 3% risk. [12]. In addition, both the number of adenomas in the index colonoscopy and the number of adenomas during the lifetime of the person are important risk factors for colorectal cancer. Patients with 3 or more tubular adenomas smaller than 10

mm have a greater risk of advanced neoplasia than patients with 1 or 2 tubular adenomas smaller than 10 mm at baseline. The risk of metachronous advanced adenoma increases with a baseline number of adenomas [14]. In our study, the rate of high-risk polyps was 20%, and high-risk polyps were found to be statistically significantly higher in men than in women ( $p=0.026$ ), but there was no significant difference according to age ( $p=0.101$ ). Betes et al. reported that male gender, older age, and high body mass index were risk factors for high-risk adenoma. Male gender was significantly associated with the highest risk of advanced adenoma after adjusting for other variables in the model. As a result of this analysis, they suggested a scoring system with 2 points for the male gender and zero points for the female gender [15]. Greenspan et al. reported older age and male gender as important independent variables associated with advanced adenoma detection [16]. In a large study conducted by Regula J et al. on 50 thousand 148 patients, it was reported that high-risk adenomas were higher in men than in women in all age groups. However, they did not find a relationship with age [17]. On the contrary, Stegaman et al. found a relationship between age and advanced adenoma, but could not find a relationship between gender and advanced adenoma [18]. We are of the opinion that there is a need for more work on this issue.

The most important limitation of this study is that other parameters of the patients such as body mass index and smoking could not be evaluated.

## Conclusion

This study showed that high-risk adenoma is more common in males. The higher incidence of colorectal cancer in men may be due to this situation. Also, most patients avoid the procedure because of pre-colonoscopy preparation and sedation. Process avoidance behavior is even more common in men. For these reasons, we are of the opinion that more insistence and encouragement should be made on screening in men.

## Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

## Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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## Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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