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DEMOGRAPHIC AND LIFESTYLE RISK FACTORS FOR SMALL ADENOMATOUS COLORECTAL POLYPS

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Abstract

Introduction: Adenomatous colorectal polyps are well-recognized precursors of colorectal cancer. Identification of risk factors associated with their development remains essential for effective prevention and early detection strategies.

Aim: To assess demographic and lifestyle-related risk factors associated with small adenomatous colorectal polyps, including sex, age, smoking, and positive family history of colorectal cancer.

Materials and Methods: This cross-sectional study included 205 patients with a total of 346 histologically confirmed adenomatous colorectal polyps sized 4–10 mm. All polypectomies were performed at a single center by one experienced endoscopist over a two-year period. Data on sex, age, smoking status, and family history of colorectal cancer were analyzed.

Results: Adenomas were more frequently detected in male patients (54.1%) than in females (45.9%). The mean age was 53.8 years for males and 56.9 years for females. Smoking was reported in 38.5% of patients and was significantly associated with adenoma presence (OR=1.58; 95% CI: 1.07–2.34; $p<0.05$). A positive family history of colorectal cancer was present in 19.5% of patients and showed a statistically significant association with adenoma detection ($p<0.05$).

Conclusion: Male sex, smoking, and family history of colorectal cancer are important risk factors for small adenomatous colorectal polyps. These findings support current prevention and screening concepts.

Keywords: colorectal polyps, adenomas, colorectal cancer, risk factors.

Introduction

Most colorectal cancers arise from adenomatous polyps. Prevention of colorectal cancer is possible through colonoscopic examinations during which potentially malignant adenomatous polyps are detected and removed. This concept dates back to 1965, when Gilbertsen and colleagues demonstrated that polypectomy could interrupt the malignant transformation of colorectal polyps [1].

According to the US National Polyp Study, 76–90% of colorectal cancer-related morbidity can be prevented by endoscopic removal of adenomatous polyps, with a concomitant reduction in mortality of approximately 53% [2].

Colorectal cancer is among the most common malignancies worldwide. Data from the Global Cancer Observatory (GLOBOCAN) for 2022 report 1,926,425 new cases and 904,019 deaths, with a predominance in males and increasing incidence after the age of 40. It is expected that the incidence will reach 2.36 million by 2050, representing a 22.51% increase compared to 2022 [3]. It is predicted that by 2040, the number of new cases of colorectal carcinoma worldwide will reach 3.2 million [4].

The etiology of colorectal polyps and colorectal cancer is multifactorial. Approximately 5–10% of cases are attributable to hereditary mutations [5].

Many studies have demonstrated that first degree relatives of patients with CRC have a 2-to 4- fold risk of developing this neoplasm compared with the general population. Numerous environmental factors may modulate cellular changes, increasing the risk of adenoma formation and progression to colorectal

cancer. Smoking is associated with a 1.5- to 2-fold increased risk of adenomatous polyps, while former smokers also demonstrate higher risk compared with individuals who have never smoked [6].

Smoking has been linked to colorectal neoplasia through mechanisms such as microsatellite instability, CpG island methylator phenotype, BRAF mutations, and impaired immune regulation [7].

Dietary factors also play a role in colorectal carcinogenesis. Diets rich in red and processed meat may alter gut microbiota composition, promote colonic inflammation, induce DNA damage, and impair apoptosis, resulting in epithelial barrier dysfunction and increased production of proinflammatory cytokines [8-10]. Dysbiosis of the intestinal microbiota has likewise been implicated in the development of adenomas and colorectal cancer [9-11,12,13].

Materials and Methods

This randomized, prospective, cross-sectional study was conducted at the Private General Hospital Remedika, Skopje, N. Macedonia, over a two-year period. The study included 205 patients with 346 detected sessile colorectal polyps sized 4–10 mm. Following histopathological analysis, only adenomatous polyps were included. Patient sex, age, smoking status, and positive family history of colorectal cancer were evaluated as potential risk factors. Colonoscopy and polypectomy were performed using the Olympus EVIS EXERA CV III 190.

Inclusion criteria were patients aged 18–80 years of both sexes with sessile adenomatous colorectal polyps sized 4–10 mm incidentally detected during colonoscopy.

Exclusion criteria included age below 18 or above 80 years, pedunculated or hyperplastic polyps, and inflammatory bowel disease.

Results

The largest proportion of resected adenomas measured 4 mm (32.6%), followed by 5 mm (22.2%), 6 mm (13.9%), and 10 mm (11.3%). More than 54% of polyps were sized between 4 and 5 mm, with a statistically significant difference compared with larger lesions ($p<0.05$)(table 1, figure 1).

Table 1. Polyp size distribution.

Големина на полипи/mm	Број	%
4	113	32.6
5	77	22.2
6	48	13.9
7	33	9.5
8	25	7.2
9	11	3.2
10	39	11.3
Вкупно	**346**	**100.0**

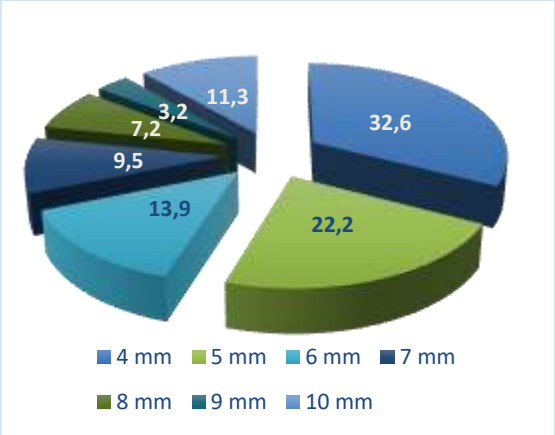

Figure 1. Polyp size distribution

The mean polyp size was 5.9±2.0 mm, ranging from 4 to 10 mm. Half of the polyps were smaller than 5 mm (median 5 mm; IQR 4–7), as shown in Table 2.

Table 2. Mean polyp size.

Number	Mean	Median	Minimum	Maximum	25	75	Std.Dev.
346	5.9	5.0	4.0	10.0	4.0	7.0	2.001610

A positive family history of colorectal cancer was reported in 40 patients (19.5%), showing a statistically significant association with adenoma detection ($p<0.05$). A significant association was registered between family history and colon polyp for $p<0.05$ (Pearson Chi-square: 41.5216).

In patients who have a positive family history of colorectal cancer, the possibility of diagnosing a polyp increase (OR=0.2439 (CI 95% (0.1569-0.3792).

Of the 205 patients, 111 (54.1%) were male and 94 (45.9%) were female. A total of 202 polyps (58.3%) were resected in male patients and 144 (41.6%) in female patients.

The mean age of all patients was 55.2±12.1 years (range 27–79 years).

The average age for males was 53.8±12.6 years, ranging from 27-79 years. 50.0% of male patients are younger than 54 years for Median IQR=54(43-65). The average age for women is 56.9±11.2 years, ranging from 31-76 years. 50.0% of female patients are younger than 60 years fir Median IQR=60 (50-65). Distribution of resected polyps according to age group and sex is presented in Table 3.

Table 3. Mean age of patients according to sex

Sex/Age	Mean	N	Std.dev.	Min.	Max.	Percentiles		
						25th	50th (Median)	75th
Male	53.8	111	12.6	27.0	79.0	43.0	54.0	65.0
Female	56.9	94	11.2	31.0	76.0	50.0	60.0	65.0
Total	**55.2**	**205**	**12.1**	**27.0**	**79.0**	**45.0**	**57.0**	**65.0**

The difference in average age between the sexes is without a statistically significant difference ($p>0.05$), (table 4).

Table 4. Mann-Whitney U Test.

Rank Sum - m	Rank Sum - z	U	Z	p-value	N - m	N - z
10641.50	10473.50	4425.500	-1.86899	0.061624	111	94

The highest number of polyps in males (27%) was detected in the 50–59-year age group, whereas in females the highest number was observed in the 60–69-year age group (26%). Overall, most polyps were detected in patients aged 60–69 years (26.8%). No statistically significant association was found between age group and sex ($p>0.05$) (table 5). (figure 2).

Table 5. Distribution of polyps by age groups and sex

Age/sex	Male		Female		Total	
	Number	%	Number	%	Number	%
18-29	2	1.8	0		2	1.0
30-39	11	9.9	10	10.6	21	10.2
40-49	29	26.1	15	15.9	44	21.5
50-59	30	27.0	22	23.4	52	25.4
60-69	21	18.9	34	36.1	55	26.8
>=70	18	16.2	13	13.8	31	15.1
Total	**111**	**100**	**94**	**100**	**205**	**100**

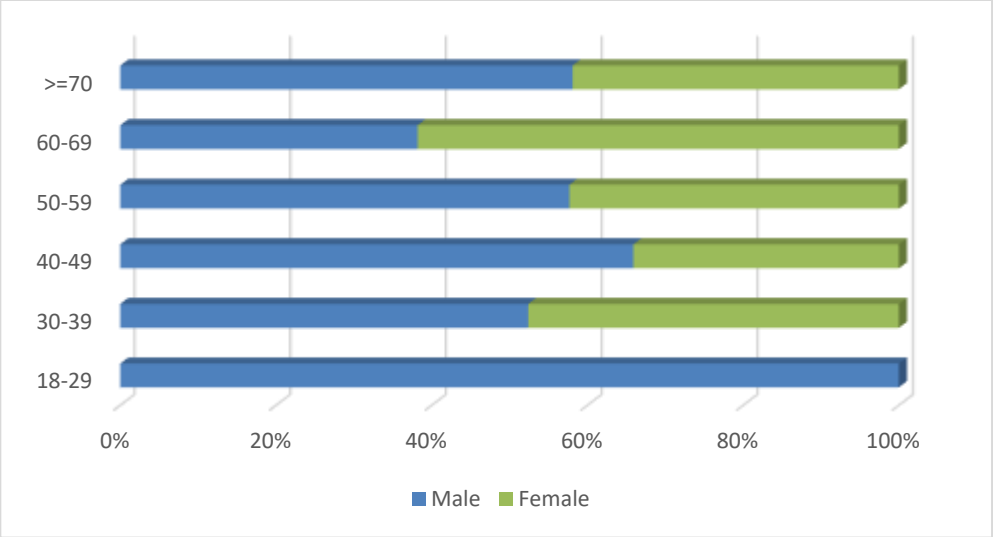

Figure 2. Distribution of polyps by age groups and sex

Regarding smoking status, 79 patients (38.5%) were smokers and 126 (61.5%) were non-smokers. Smoking showed a statistically significant association with the presence of adenomatous colorectal polyps (OR=1.58; 95% CI: 1.07–2.34; $p<0.05$).

Discussion

The presence of colorectal cancer in the family is a recognized risk factor for the development of colorectal polyps and colorectal cancer [14-17]. In this study, 19.5% of patients reported a positive family history of colorectal cancer, confirming a significant association with adenoma detection.

This finding is consistent with previously published data and supports existing recommendations for earlier and more intensive colonoscopic surveillance in these individuals.

Smoking is an established risk factor for colorectal cancer and its precursor lesions [15-17]. The chance of developing adenomatous polyps in smokers is up to three times higher [18,19].

The significant association between smoking and adenomatous colorectal polyps observed in our cohort is in line with previous reports and further emphasizes smoking cessation as an important and potentially modifiable preventive strategy [7].

Male sex has been identified as a risk factor for colorectal adenomas in numerous epidemiological studies [15]. In the present study, males accounted for 54.1% of patients and 58.3% of resected polyps, which is consistent with the predominance reported in the literature [21-24].

Age remains a key determinant in the development of colorectal adenomas. Most polyps in this study were detected in patients aged 50–69 years. The risk of developing adenomas doubles between the ages of 50-54 and 70-74 [25]. However, a substantial proportion of male patients were younger than 50 years, a finding that may be clinically relevant and warrants further investigation in future prospective studies.

Conclusion

Male sex, smoking, and positive family history of colorectal cancer are significant risk factors for small adenomatous colorectal polyps. Recognition of these factors is essential for colorectal cancer prevention and supports current screening recommendations.

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