Original Research

Colonic polyps in North-Western Romania: a comprehensive single-center analysis of endoscopic and pathological features

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Abstract

Background and aims. Most colorectal cancers (CRC) originate from precancerous adenomatous and serrated lesions. Accepted risk determinants for conventional adenomas and CRC include age, male gender and familial history. The aim of our study was to outline the characteristics of colorectal polyps in our center, as well as to uncover associations between them and certain clinical presentations.

Methods. We retrospectively collected the data available in a tertiary center of the patients that underwent colonoscopy for various indications (e.g.: rectorrhagia, abdominal pain, screening, anemia etc.) between the 1st of January 2022 and the 1st of August 2023. We analyzed the age, gender and symptoms of the patients. We analyzed the colorectal polyps detected. We classified the polyps based on location, size, shape, architecture and dysplasia grade. Statistical analysis was conducted to evaluate potential associations between their characteristics.

Results. 248 subjects were identified and included in the study. There were 584 polyps uncovered during the colonoscopies in 248 subjects. 498 polyps were excised and retrieved; 44.5% were right-sided and 55.5% were left-sided. Most of the polyps were < 1 cm (78.2%). There were significantly more adenomatous polyps (68.8%) than non-adenomatous (31.2%). Most of the polyps had a low grade of dysplasia (59.8%). There were significant associations between the polyp size and dysplasia grade, number and location on the transverse colon. Polyps under 1 cm were more likely to be tubular (p=0.008). The age of the patients >50 years was associated with a greater number of polyps (p=0.002). There was a moderate statistically significant association (p=0.0297) between the male gender and the number of adenomatous polyps.

Conclusions. Male gender, age greater than 50 years, history of colorectal polyps are risk factors for the development of colorectal polyps in the studied population. A history of more than 2 polyps and a size greater of 1 cm can be associated with higher rates of dysplasia.

Keywords: colonic polyps, risk factors, colorectal cancer

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Introduction

Colorectal cancer (CRC) remains a significant global health challenge, ranking as the third most frequently diagnosed cancer and the second most lethal malignancy for both men and women [1]. In Romania, CRC has emerged as the digestive malignancy with the highest mortality and incidence in 2012 [2]. The prevalence of hospitalized patients with CRC was 108.24/100,000 inhabitants in 2016, 113.09/100,000 inhabitants in 2017 and 116.83/100,000 inhabitants in 2018. Higher rates of CRC and CRC-related deaths were found in the northern and central regions and a very low prevalence and mortality was exhibited in Bucharest and southern provinces [3]. The mortality rate of CRC has been constantly increasing every year from 14.9/100.000 deaths in 1995 to 19.2/100.000 deaths in 2003 [3].

These findings established that the adenoma-carcinoma sequence represents the step-by-step mechanism by which colorectal malignancies develop [4]. Colonoscopy is considered the gold standard for CRC screening and for polyp removal.

Colonic adenomas are protrusions occurring in the colon lumen most commonly sporadic or as part of other syndromes such as familial adenomatous polyposis. The polyps represent a heterogeneous group of lesions with varying morphological and histological characteristics, ranging from benign to potentially malignant. The morphology of the colorectal polyps is defined endoscopically according to the Paris classification [5]. Several studies showed that increasing age and the male gender are significant factors associated with an increased risk of developing colonic adenomas [6,7].

The aim of this research is to provide a comprehensive description of the phenotypes and of associated factors in our area. Furthermore, the study aims to investigate the associations that exist between specific risk factors and characteristics of polyps found through endoscopic and pathological analysis.

Methods

We conducted the present retrospective cohort study using the medical database at Emergency Clinical County Hospital, 2nd Department of Internal Medicine in Cluj-Napoca, Romania. We selected the patients that underwent a colonoscopic examination between the 1st of January 2022 and the 1st of August 2023 in the Endoscopy Department.

The patients underwent a colonoscopy for one or more of the following reasons: rectorrhagia, abdominal pain, screening for CRC, anemia and warning signs (weight loss of more than 5 kg in a month and/or anorexia).

The inclusion criteria were: (1) patients had at least one colorectal polyp diagnosed during a colonoscopy performed in the aforementioned period in our clinic; (2) the patient underwent polypectomy with at least one of the resected polyps being retrieved; (3) at least one of the retrieved polyps had a complete pathological report; (4) cecal intubation was achieved.

The following exclusion criteria were established for our study: (a) the polypectomy could not be performed because of the patient's anticoagulant therapy, poor preparation, active bleeding or comorbidities; (b) the colonoscopy revealed no polyps; (c) the polypectomy was performed but no polyp could be retrieved; (d) the pathological report was still processing until the 1st of August 2023; (e) the patient was suffering from any of the following conditions: colorectal cancer, an inflammatory bowel disease or had a partial or total colectomy; (f) the histological structure of the polyp was any other than inflammatory polyp, hyperplastic polyp, tubular adenoma, villous adenoma, tubulovillous adenoma or serrated adenoma. The selection process is outlined in figure 1.

The procedures were carried out at random by one of four experienced endoscopists. Bowel cleansing was assessed with the Boston preparation scale [8]. The endoscopy system used was the Olympus Evis Exera III model. The polypectomies were performed using biopsy-forceps or hot-snares. In preparation of the analysis, the polyps were classified according to the endoscopic appearance as flat, pedunculated or sessile. Polyps located on the rectum, sigmoid colon and descending colon were classified as left sided (LS) whist the polyps on the transverse colon, ascending colon and cecum were considered right sided (RS).

Another classification was based on the information from the pathological reports: non-adenomatous polyps (NAPs) and adenomatous polyps (APs). Furthermore, based on their architecture, they were subdivided as hyperplastic non-adenomatous polyps (H NAPs), inflammatory non-adenomatous polyps (I NAPs), tubular adenomas (T APs), villous adenomas (V APs), tubulovillous adenomas (TV APs) and serrated adenomas (S APs).

Microsoft Excel was used for data collection. For the statistical analysis we used IBM SPSS Statistics version 26. Descriptive statistics, including means and standard deviations (SD), were calculated for all continuous variables. The independent samples t-test was used to compare the means of two independent groups. Categorical variables were analyzed using chi-squared tests. Pearson's correlation coefficient was used to assess the linear relationship between two continuous variables. Contingency tables were used to analyze the relationship between two categorical variables. A *p*-value of less than 0.05 was considered statistically significant.

All participants gave their written informed consent for the colonoscopy and the biopsy.

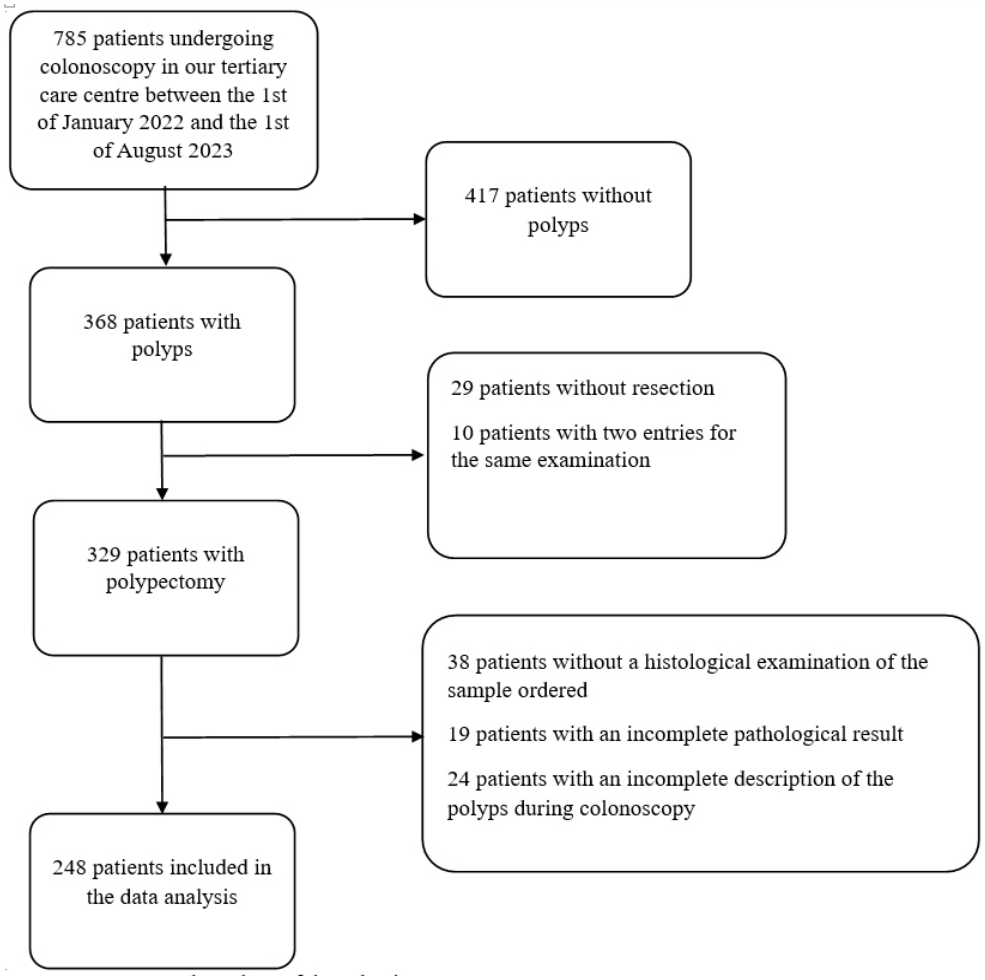

Figure 1. Flow chart of the selection process.

Results

According to the recruiting criteria, we included in our study 248 patients.

The mean age of our group was 64.1 ± 11.0 years (53.1-75.1 years). Of all 248 patients, 128 (51.6%) were females and 120 (48.4%) were males. The general characteristics of the patients are synthetized in table I.

Colonoscopy was performed for one or more of the following reasons: among the 375 total complaints, 53 (14.2%) were for rectorrhagia, 109 (29.1%) for screening, 100 (26.6%) for abdominal pain, 51 (13.6%) for anemia, and 33 (8.8%) for general warning signs (defined as anorexia and/or a 5 kg weight loss in 1 month). Additionally, 29 (7.7%) were investigated for irritable bowel syndrome (IBS). For the distribution of symptoms by patient age, refer to figure 2.

Table I. General characteristics of the patients.

Number of patients	248
Sex	
Male	120 (48.3%)
Female	128 (51.6%)
Age range	21-87
Mean age (years)	64.1 ± 11.03 [a]
Outpatients	42 (16.9%)
Inpatients	206 (83.06%)
Mean days of hospitalisation	5.14 ± 3.86 [a]
Age Distribution	
31-40	3 (1.2%)
41-50	22 (8.8%)
51-60	45 (18.1%)
61-70	104 (41.9%)
> 70	73 (29.4%)

[a]Data are shown as the mean ± standard deviation of the mean.

During the colonoscopies, 584 polyps were discovered, with 557 being excised and 498 successfully retrieved. Figure 3 depicts the distribution of these polyps across different colon segments.

The distribution of the polyps among age groups is shown in table II.

Of the total 584 polyps, 580 had size description during endoscopy, 454 polyps (78.2%) were <1 cm and 126 (21.8%) were > 1 cm (defined as large polyps); 260 (44.5%) polyps were RS and 324 (55.47%) polyps were LS.

The polyps with an endoscopic description were classified as follows: 30 polyps (5.1%) were flat, 91 polyps (15.6%) were pedunculated, and 459 polyps (79.3%) were sessile.

Histologically, 498 polyps were classified according to their architecture, 134 (26.9%) were H NAPs, 21 (4.3%) were I NAPs, 282 (56.6%) were T APs, 52 (10.4%) were TV APs, 5 (1.0%) were V APs and 4 (0.8%) were S APs. The analysis of the grade of dysplasia resulted in the following distribution: 151 (30.4%) polyps had no dysplasia, 298 (59.8%) polyps had low-grade dysplasia, 40 (8.0%) polyps had high-grade dysplasia and 9 (1.8%) polyps had areas of adenocarcinoma present.

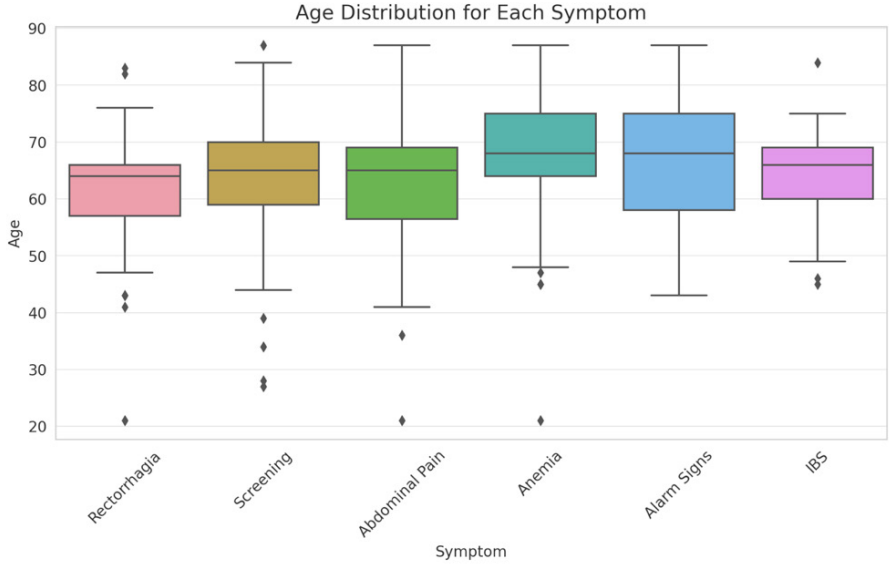

Figure 2. Age-based distribution of patients based on their colonoscopy indications.

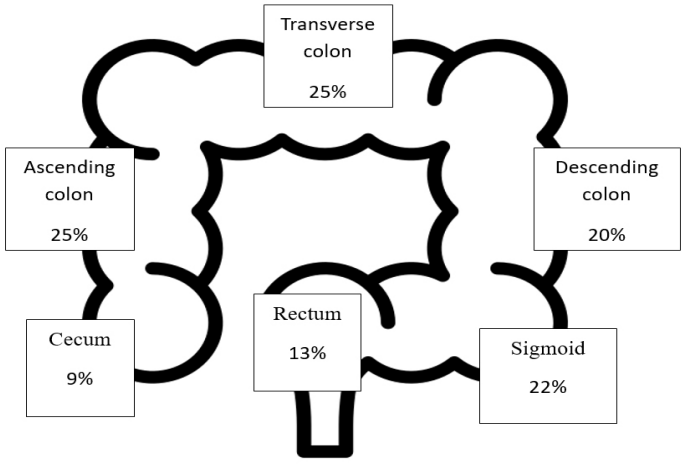

Figure 3. The proportion of the polyps based on location.

Table II. The number of polyps based on the colon segment in each age group.

	Patients <31 years old [i]	Patients 31-40 years old [i]	Patients 41-50 years old [i]	Patients 51-60 years old [i]	Patients 61-70 years old [i]	Patients>70 years old [i]
No. of RS polyps	**0**	**0**	**10 (25.7%)**	**42 (50.0%)**	**87 (37.5%)**	**121 (55.2%)**
Cecum	*0*	*0*	*2 (5.2%)*	*8 (9.5%)*	*20 (8.6%)*	*22 (10.0%)*
Ascending colon	*0*	*0*	*8 (20.5%)*	*24 (28.6%)*	*47 (20.3%)*	*66 (30.1%)*
Transverse colon	*0*	*0*	*0*	*10 (1.1%)*	*20 (8.6%)*	*33 (15.1%)*
No. of LS polyps	**4 (100.0%)**	**6 (100.0%)**	**29 (74.3%)**	**42 (50.0%)**	**145 (62.5%)**	**98 (44.8%)**
Descending colon	*1 (25.0%)*	*1 (16.6%)*	*8 (20.5%)*	*10 (1.1%)*	*51 (22.0%)*	*44 (20.1%)*
Sigmoid colon	*3 (75.0%)*	*3 (50.0%)*	*10 (25.6%)*	*19 (22.5%)*	*57 (24.5%)*	*40 (18.3%)*
Rectum	*0*	*2 (33.4%)*	*11 (28.2%)*	*13 (15.4%)*	*37 (16.0%)*	*14 (6.4%)*
Total No. of polyps	**4**	**6**	**39**	**84**	**232**	**219**

[i] the results are shown as absolute value (percentage of total polyps in the respective age group).

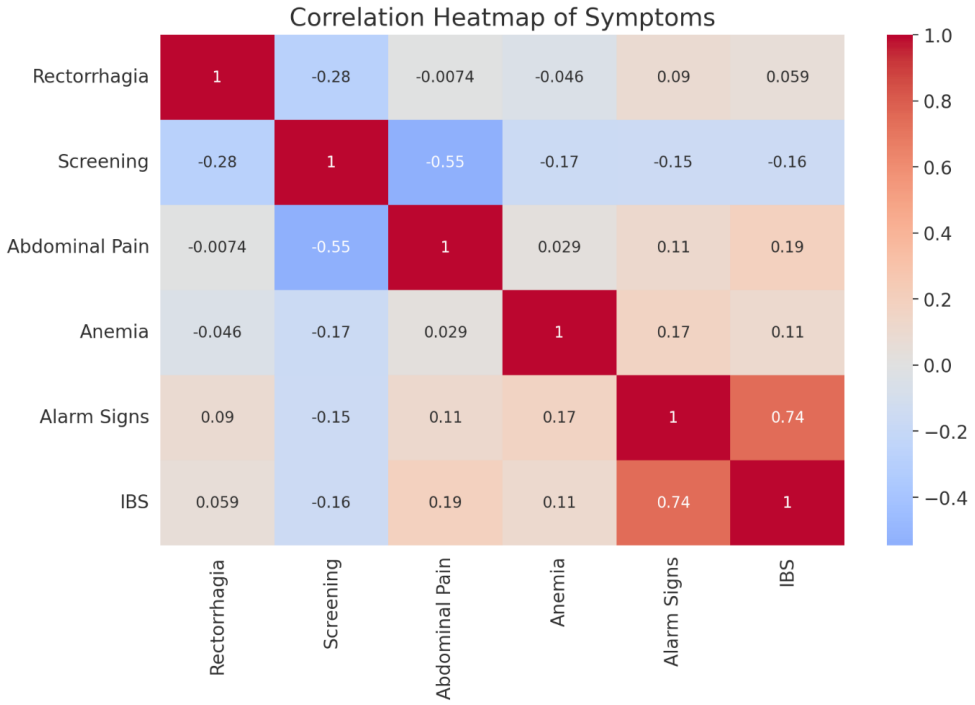

Figure 4. The correlation heatmap of colonoscopy indication.
Note - The correlation heatmap visually represents the strength and direction of relationships between different symptoms in patients diagnosed with colonic polyps. The numbers in each cell range from -1 to 1. A value of 1 indicates a perfect positive correlation. A value of -1 indicates a perfect negative correlation. Red shades indicate positive correlations. Blue shades indicate negative correlation.

There was a statistically significant association between the location of the polyps in the sigmoid colon and the presence of rectorrhagia (R.R.= 3.15, C.I. 95%=1.42-7.40, p=0.014) and anaemia (R.R.= 2.05, C.I. 95%=1.05-5.62, p=0.020).

There was a statistically significant association between the group of patients >50 years old and the number of polyps (p=0.002) There was a moderate statistically significant association (p=0.0297) between the male gender and the number of APs.

There was a statistically significant association between the polyp size and dysplasia grade (R.R.=1.43 C.I. 95%=1.12-2.67, p=0.00884). There were statistically significant associations found between polyp size and the number of polyps and location on the transverse colon (p<0.05), but not for the other locations analyzed. Polyps

under 1 cm were more likely to be tubular (R.R.= 1.64, C.I. 95%=1.521-2.073, p=0.008).

There was a statistically significant association between the group with more than one polyp diagnosed and the presence of dysplasia (R.R.= 2.53, C.I. 95%=1.72-6.43, p=0.002).

Discussion

Our study aimed to identify colonic polyps in our area (North-West Romania) and to correlate them with demographic data and risk factors.

Gender is a known risk factors for developing colonic polyps [6,9]. Similar to prior research, it is observed that males exhibit a greater chance than females for developing adenomatous polyps [9,10]. However, conclusive evidence could not be established for the non-adenomatous polyps and for the association between female gender and a lower prevalence of polyps >10 mm, both being documented before [11,12].

Elderly people are also recognized as an important risk group for developing colonic adenomas, numerous corroborating studies defending this affirmation [12,13]. Our study found an association between age over 50 years and the number of polyps, in agreement with other published research [13]. The age groups of 61-70 years and over 71 years presented with the highest count of polyps and the greatest frequency of high dysplasia.

Our research found a higher prevalence of left side polyps than right side polyps particularly in the sigma and followed by the descending colon. Despite recto-sigmoidoscopy being a decent alternative for the total colonoscopy, the maximum reach would only investigate the rectum, the sigma and the descending colon failing to detect 44.5% of the total polyps found in the current study. Compared to a similar study conducted in the same geographic area, our current research confirms the trend of increasing prevalence of right colonic adenomas compared to the left side. The previous study reported 28% right colonic adenomas between 1996 - 2003, and 38.38% between 2004 - 2011, whereas our current study shows a prevalence of 44.5% right colonic adenomas [14].

Patients with ≥2 polyps had a greater chance for developing high-grade dysplasia than patients who had only one polyp [13]. However, we were unable to categorize it as an independent risk factor given the data collection methods used in our study. Other studies found the same association for patients >3 polyps [7,15].

Polyp sizes >10 mm were associated with an increased likelihood of high-grade dysplasia, consistent with other findings [5,7,15]. Additionally, data from other studies indicate that even polyp sizes over 5 mm are linked to a higher grade of dysplasia [16].

Out of the three morphological patterns considered, sessile (0-Is) polyps were the most frequent lesion and we did not detect any slightly depressed (0-IIc) or excavated forms (0-III). The percentages were comparable to other studies even attributed to a different study population, study methodology, sample size and time period [17].

The incidence of H NAPs (8.7%) and T APs (54.3%) was significantly lower compared to the data in 2021 by another center from the south-west region, however the incidence of V APs (3.1%) and TV APs (42.5%) was higher. Moreover, we encountered less high-grade dysplasia polyps (13.8%) compared to their data (26.9%). Furthermore, their data showed that adenomas were predominantly found on the sigmoid colon (30.4%) followed by the rectum (22.4%) while our data presented an average on the ascending colon (24.8%) followed by the sigmoid colon (22.6%) [18].

Certain constraints influenced the result of our study. Firstly, our study relied on a small sample size derived exclusively from a single region and a single medical center situated in Cluj County. Because of that, we are susceptible to bias caused by regional variations such as geographic distribution, diet, traditions, physical activity, certain genetic factors and demographic distribution. Our study had a retrospective approach and due to the data collection methodology, we were unable to associate the size of the polyp or the location in the colon with the pathology report. Due to the observational design of our study, causality between the evaluated associations cannot be evaluated or negated.

Conclusions

Our findings underscore the importance of ongoing surveillance, education in colorectal cancer prevention. Gender and age were identified as significant risk factors for colonic polyps in the studied population, with males and age over 50 years old showing a higher prevalence of adenomatous polyps, particularly in the left side of the colon. Multiple polyps were associated with an increased likelihood of high-grade dysplasia, as were larger polyp sizes. Sessile polyps were the most common morphological type observed and this study also confirms the increasing trend of right-sided colonic polyps. The most common histological type were T APs and the majority of polyps had a sessile aspect during colonoscopy. Larger studies are needed to confirm these results and provide more robust conclusions.

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