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Original article

Incidence and characterization of colorectal adenomas in the area of influence of a specialized institution

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Abstract

Aim: To locate and characterize colorectal adenomas endoscopically and histologically in a cohort of patients undergoing colonoscopy in Medellín, Colombia. **Materials and methods:** Descriptive cross-sectional study. We included patients older than 18 years who underwent colonoscopy between February and July 2020 at a specialized center in Medellín, Colombia. We determined the incidence of adenomas, their location in different segments of the colon, their endoscopic and histological characteristics, and cases of colorectal cancer (CRC) and high-grade dysplasia (HGD). **Results:** 992 colonoscopies were performed, finding colorectal polyps in 266 patients, of which 208 had adenomas. We resected 461 polyps, of which 336 were adenomas (72 %). The histological type with the highest representation was tubular (78 %). The location of adenomas was 37 % in the right colon, 25 % in the transverse colon, and 38 % in the left colon. CRC cases were nine per 1,000 patients, including advanced carcinoma and carcinoma *in situ* (HGD). **Conclusions:** Given the incidence of adenomas in the right and transverse colon, rectosigmoidoscopy is discouraged as a screening study for CRC. Tubular adenomas, sessile in appearance and tiny, predominated in the population studied. We recommend screening in the population over 40 years of age and the search for precursor lesions as strategies to reduce morbidity and mortality rates due to CRC.

Keywords

Colonoscopy, colorectal adenomas, colorectal cancer.

INTRODUCTION

The prevention of colorectal cancer (CRC) is an objective of public health in different countries worldwide. Primary prevention includes modifying risk factors in the lifestyle and diet of patients. In contrast, secondary prevention focuses on the surveillance and follow-up of patients with an average or high risk of developing the disease, such as 50 years of age or older, family history of CRC, familial adenomatous polyposis, or inflammatory bowel disease[(1)].

Carcinogenesis in CRC is a process that can take years and, therefore, allows identifying cancer precursor lesions that, when resected, would reduce the risk of developing the disease. There must be easy access to diagnostic and therapeutic colonoscopy programs.

The present study aims to describe the findings of a cohort of patients undergoing colonoscopy regarding the location and endoscopic and histological characterization of colorectal adenomas.

MATERIALS AND METHODS

A cross-sectional study was conducted in a gastroenterology institution in Medellín, Colombia, between February

and July 2020. All outpatients over 18 years of age admitted for colonoscopy after signing the informed consent were included consecutively.

A database was built from demographic, endoscopic, and histologic data obtained from colonoscopy and pathology reports. The study variables were age, sex, the scope of the examination, assessment of the quality of colon preparation using the Boston scale, endoscopic result, histological result, type of polyp, number of resected polyps, location of the polyps, aspect, size, presence of dysplasia, and presence of adenocarcinoma.

A total of 992 colonoscopies were performed in the study period by a team of seven gastroenterologists and interpreted by a group of two pathologists with training in gastrointestinal histopathology.

The colonoscopes used are high definition, with different light filters such as LCI (linked color imaging), BLI (blue light imaging), and NBI (narrow-band imaging) and magnification for lesion characterization. Polyp resection was performed with biopsy forceps or polypectomy snare, depending on the lesion size. The size of the lesion was estimated by comparing the polyp with the fully open biopsy forceps (7 mm in length) or the polypectomy snare (15 and 30 mm in diameter)[2] and classified according to the following criteria: minute (up to 5 mm), small (6–9 mm), and large (≥ 10 mm)[3].

The findings in the endoscopic report describe the size, quantity, and aspect of the resected polyps according to their location by colon segments. According to the Paris Classification, the endoscopic element was not included in the analysis.

A complete histological study of the polyps was performed, which were deposited in 10% buffered formalin and stained with hematoxylin and eosin to diagnose the histological type of each polyp (adenomatous, non-adenomatous), determine the grade of dysplasia according to the Vienna classification[4], and classify the adenoma according to its architecture as serrated, tubular, tubulovillous, or villous[5].

The institutional ethics committee approved the study, considering it without risk since no intentional intervention or modification of the biological, physiological, psychological, or social variables of the individuals who participated in the study was carried out. In turn, it contemplates the fundamental principles of research ethics following the Declaration of Helsinki version 2013[6] and the provisions of Resolution 008430/1993 issued by the Ministry of Health of Colombia[7].

Statistical analysis

The descriptive analysis of the population was carried out with the programs Excel version 2010 and Jamovi version 1.2.25. Absolute and relative frequencies were determined for qualitative variables and measures of central tendency and dispersion for quantitative variables. The chi-square association test was used for independent samples, estimating the odds ratio (*OR*) with its appropriate 95% confidence interval (*CI*). A statistically significant *p*-value < 0.05 was considered.

RESULTS

Data were obtained from the reports of 992 consecutive patients who underwent complete colonoscopy between February and July 2020 at a third referral gastroenterology institution in Medellín, Colombia. All patients included in the study met the criteria of the entire examination scope, the Boston scale result to assess the quality of colon preparation, and the measurement of colonoscope withdrawal time (≥ 6 minutes).

Sixty-one percent of the population with colorectal polyps are women, and the average age was 52.8 years, with a standard deviation of 14.7. The age range oscillated between 18 and 89 years. Demographic and follow-up variables are described in **Table 1**.

Five main indications for colonoscopy were identified: screening for CRC (47%), gastrointestinal symptoms (33%), personal history of polyps (15%), family history of CRC (3%), and positive fecal occult blood (2%). A greater indication for colonoscopy due to gastrointestinal symptoms was identified in women (OR: 1.36; 95%CI: 1.03–1.79; p = 0.029) and a personal history of polyps in men (OR: 1.72; 95%CI: 1.20–2.47, p = 0.003).

Two hundred sixty-six patients with colorectal polyps and 461 resected polyps were identified, characterizing 125 (27%) as non-adenomatous polyps (**Table 2**). In 32% of patients, more than one adenoma was resected.

The content of this article focuses on the characterization of adenomatous polyps. Adenoma detection was 21% (208 patients with adenomas out of 992 patients evaluated). In these 208 patients, 336 adenomas were resected. The most common macroscopic aspect was sessile (85%) and flat or pedunculated lesions to a lesser extent. Six mass-type lesions (2%) were identified: adenocarcinomas or adenomas with high-grade dysplasia (HGD). Of the resected lesions, 71% were categorized as minute (less than 5 mm), 18% small, and 11% large. One minute adenoma with HGD and eight larger advanced lesions were found.

The location of the adenomas was in the ascending (37%) and transverse (25%) colon. There were no statistically significant differences in the detection of adenomas between the right and left colon (**Table 2**).

Regarding the histopathology of the resected adenomas, three different types were identified (serrated, tubular, and

Table 1. Demographic information and characterization of adenomas

Variable	n (%)
Sex	
- Female	602 (61)
- Male	390 (39)
Age range	
- < 40	8 (3,8)
- 40-49	25 (12)
- 50-59	70 (33,7)
- 60-69	60 (28,8)
- 70-79	33 (15,9)
- > 80	12 (5,8)
Location	
- Rectum	39 (11,6)
- Sigmoid	56 (16,7)
- Descending	33 (9,8)
- Transverse	83 (24,7)
- Ascending	96 (28,6)
- Cecum	29 (8,6)
Size	
- ≤ 5 mm (minute)	240 (71)
- 6-9 mm (small)	60 (18)
- ≥ 10 mm (large)	36 (11)
Aspect	
- Flat	19 (6)
- Sessile	287 (85)
- Pedunculated	24 (7)
- Lump	6 (2)
Dysplasia grade	
- LGD	327 (97,3)
- HGD	5 (1,5)
- Adenocarcinoma	4 (1,2)

tubulovillous); 97% had low-grade dysplasia. We observed that the predominant histological type is tubular (78%), followed by the serrated type (18%). No villous adenomas were identified (**Table 2**).

Table 2. Histological type and location of polyps

	Right colon	Transverse colon	Left colon	Overall, n (%)
Adenoma				
- Serrated	17	7	38	62 (18)
- Tubular	105	73	84	262 (78)
- Tubulovillous	3	2	5	10 (3)
- Indeterminate	0	1	1	2 (1)
- Overall, n (%)	125 (37)	83 (25)	128 (38)	336 (100)
Polyp				
- Inflammatory	0	3	4	7 (6)
- Hyperplastic	20	17	81	118 (94)
- Overall, n (%)	20 (16)	20 (16)	85 (68)	125 (100)

Four new cases of CRC and five cases of HGD (considered carcinoma *in situ*) were obtained. In the case of these nine patients, five were men and four women, with a mean age at diagnosis of 69 years.

No cases of CRC or HGD were found in the studied population's rectum or descending colon.

DISCUSSION

A *polyp* is a visible protrusion that may develop on the surface of the colon or rectum. When it comes to an adenoma, it derives from the glandular epithelium and may have different grades of dysplasia or histological characteristics associated with a potential increase in malignancy[8,9]; therefore, they are widely known as precursor lesions of CRC. For its part, adenocarcinoma is an adenomatous lesion that invades the mucosa and whose transformation to a high grade of dysplasia and invasive carcinoma requires around ten years of evolution[10]. Characterizing the number, size, and histology of adenomas makes it possible to determine adequate follow-up periods[11] that minimize the risk of advanced or interval CRC in the population concerned.

Colonoscopy screening has effectively reduced CRC mortality and prevented 60%–80% of incident lesions due to adenoma resection[12]. In most cases, polypectomy was the procedure of choice for resection. However, some situations typical of the examination could have inadvertently affected the detection of adenomas, such as inadequate intestinal cleaning of the entire colon; polyps unnoticed by their size or appearance (minute or flat); CRC that does

not follow the adenoma-carcinoma sequence or particularly aggressive precursor lesions that transform from adenoma to carcinoma in a shorter period[13].

In the examinations carried out on women, there was a more significant indication for colonoscopy due to gastrointestinal symptoms (65%). Of note is that the clinical symptoms most strongly suggest CRC are rectal bleeding and weight loss[14] and that, generally, colorectal polyps are rarely accompanied by symptoms before progressing to CRC, except for some occasional abnormalities in the stool[15]. In our population, a higher incidence of adenomas was found in men, and the male sex is an established risk factor for colorectal adenomas[16].

Of the 208 patients with adenomas, 12% were 40–49 years old, suggesting the need to start CRC screening earlier for detection and resection of precursor lesions[17].

The prevalence of adenomas in the average risk population is between 10% and 20%[18]. In our case, it was 25%, corresponding to patients over 50 years of age with no pathology or history of associated risk in whom at least one colorectal adenoma was resected.

As for the location of adenomas, other authors reported no differences between the right and left colon[11], which matches the findings in the present study. Additionally, by identifying that 62% of all resected adenomas were obtained between the right and transverse colon, performing rectosigmoidoscopy in patients screened for CRC is not considered relevant.

Size is a significant risk factor for advanced adenomas[10]; those ≥ 2 cm are considered difficult to remove entirely for various reasons: visualization is limited, the borders are difficult to identify, and there is a higher risk of bleeding[19]. Four advanced adenomas not resected due to their large size were identified in the study population. Regarding those of minute size, an adenoma was resected with HGD, corresponding to 0.3%. The proportion of minute adenomas with HGD differs between studies, reporting values of less than 1% and between 3% and 4%[3,20]. This finding suggests resecting all adenomas regardless of their size (minute or small); depending on the grade of dysplasia, the risk of progressing to CRC increases, and cases of flat, minute or depressed lesions can also be carcinomas[21]. No complications such as perforation or bleeding were associated with the polypectomy procedure.

Nineteen flat-appearing adenomas (6%) were identified, a low percentage but predictable given the difficulty in detecting them; in Japan, the incidence of flat adenomas is between 8% and 40%[22]. Sessile adenomas can also represent technical difficulties for resection due to their proximity to the submucosa. In these cases, when performing the resection, the increased risk of bleeding or perforation is inherent[19].

Most of the adenomas studied had low-grade dysplasia and tubular histology and were resected with the hot or cold loop forceps technique[23]. Lesion detection and characterization were optimized using high-definition equipment with white light and virtual chromoendoscopy, so it was possible to differentiate an adenoma from a hyperplastic polyp with greater than 90% certainty[20].

In Colombia, CRC ranks fifth in cancer incidence, with 12 cases per 100,000 inhabitants. In the study population, the incidence was much higher, reaching nine cases per 1,000 patients, because the diagnosis was made in a referral center for digestive diseases[24].

CONCLUSIONS

Given the incidence of adenomas in the right and transverse colon, rectosigmoidoscopy is not recommended as a screening study for CRC. Tubular adenomas, sessile in appearance and diminutive in size, predominated in the population studied. Screening in the population over 40 years and searching for precursor lesions are advisable as strategies to reduce morbidity and mortality rates due to CRC.

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