

Original Article

Clinicopathological Characterization of Colonic Polyps

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ABSTRACT

Aims: To describe the clinical characteristics, colonoscopic features, histological findings, dysplasia patterns, and clinical outcome of endoscopically detected colonic polyps in the Saudi population. **Methods:** This retrospective record review was conducted at King Abdulaziz University Hospital, Jeddah, Saudi Arabia, on patients who underwent colonoscopy between 2005 and 2015. Patients with colorectal cancer were excluded. Data were analyzed using SPSS software. **Results:** Among 211 patients recruited, 66.8% were males and 66.2% were Saudi. Single polyps were detected in 45.5% of cases, while 29.9%, 18%, and 6.6% had 2, 3, and 4 polyps, respectively. Regarding the size, 81%, 17%, and 2% of the polyps were <1 cm, 1–2 cm, and >2 cm, respectively. The endoscopic examination revealed that 16.4% of the polyps were pedunculated, 82.6% were sessile, and 1% were sessile and pedunculated. About 45%, 30%, 21%, and 6.6% of the polyps were located at the rectum/sigmoid, left colon, right colon, and transverse/ascending colon, respectively. Histologically, 68.6% of polyps were adenomatous and 21.3% were non-adenomatous. Mild dysplasia was detected in almost half of the studied sample (42.3%) while moderate and severe grades of dysplasia were demonstrated in 19.2% and 38.5% of the examined polyps. Surgical intervention was required in 8.1% of cases. **Conclusion:** Single small-sized sessile polyps of adenomatous type and mild dysplasia are the most common polyps in the Saudi population. Sigmoid/rectum is the most common site affected, and the outcome of polyps is generally favorable.

KEYWORDS: *Characteristics, colonoscopy, colonic polyps, dysplasia, histopathology*

INTRODUCTION

Globally, colorectal carcinoma (CRC) is considered the second most common cancer in women and the third most common cancer in men. In 2012, colonic polyps were responsible for 9.2% and 10.0% of all new cancer cases in women and men.^[1] CRC's global burden is rising, and it remains more common in men than in women both globally and in the WHO Eastern Mediterranean Region (EMRO).^[2] An analysis of national cancer registry data collected between 1994 and 2010 in the Kingdom of Saudi Arabia (KSA) showed that CRC was the most common cancer in men and the third most common cancer in women. The highest age-standardized rates for CRC were found in three major cities: Riyadh (the capital city), Mecca (in the Makkah region), and Dammam. The average age at the

time of presentation of CRC was 60 years in men and 55 years in women.^[3]

The majority (75–80%) of CRCs have a sporadic etiology while others are attributed to hereditary syndromes.^[4] The role that chronic colitis due to inflammatory bowel disease plays is limited in the etiology of CRC.^[5] Colorectal polyps increase the risk of CRC,^[4] with about 10% of polyps estimated to develop into CRC.^[6] Colorectal polyps can be classified, based on histologic and endoscopic appearances, into

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non-neoplastic types that have no malignant potential and neoplastic types that have malignant potential. The non-neoplastic types include hyperplastic polyps, hamartomas, lymphoid aggregates, and inflammatory polyps. The neoplastic types include serrated sessile adenomas (with and without dysplasia), traditional serrated adenomas, tubular adenomas, and villous and tubule-villous adenomas.^[7] Polyps with high-grades of dysplasia have the highest risk of developing colorectal cancer.^[8] Colonoscopy plays a key role in screening for CRC. There are four main indications for colonoscopy: screening for people with average risk of CRC, high-risk screening for people with above-average risk of CRC e.g., CRC in their family, surveillance for people with personal history of CRC, adenomas or other lesions, and diagnostic colonoscopy for individuals with suspicious signs and symptoms and/or an abnormal fecal immunochemical test (FIT).^[9]

Alsanea *et al.*^[10] developed guidelines in 2015 for CRC screening in KSA for Saudi patients at average risk for CRC and advised to develop an infrastructure for its implementation. There is no nationwide policy in KSA for CRC, despite concerns about an ongoing increase in the incidence of CRC.^[11] Mosli *et al.*^[12] reported an increase in the incidence of CRC in KSA from 2001 to 2006 based on national cancer registry data. Specifically for Jeddah, in the Makkah region of KSA, the incidence had also increased from 2000 to 2006.^[13] However, the clinical characteristics of polyps detected endoscopically in Saudi patients were not well-described. To our knowledge, no published data are available about the detailed features of colonic polyps in the Saudi population. Therefore, our study aimed to describe the clinical characteristics, colonoscopic features, histological findings, dysplasia patterns, and clinical outcome of endoscopically detected colonic polyps.

METHODS

This was a retrospective study conducted at King Abdulaziz University Hospital in Jeddah in the Makkah region in KSA. Data of patients who underwent colonoscopy during the period 2005–2015 were collected from the medical records. All patients whose colonoscopy revealed one or more polyps were eligible to be included in this study. Patients from both genders and at any age were included. Only patients with definite colonic cancers were excluded from this research. Ethical approval was obtained to collect data for this study.

The data collected included demographic data (age, sex, and nationality) of recruited patients, clinical data (such as family history of colonic polyposis or colonic cancer, and indication of colonoscopy), colonoscopic

findings (such as polyps number, polyps size, polyps appearance, and polyps location), actions/treatment given during colonoscopy, histological features (such as polyps nature and grades of dysplasia), and long-term follow-up and outcome (such as the need for follow-up colonoscopy, number of colonoscopies carried out further, surgical interventions required, development of carcinoma *in situ*, and death).

In this study, polyps were classified according to their histopathology into adenomatous polyps (including tubular adenomas, villous adenomas, tubulovillous adenomas, and serrated adenomas) and non-adenomatous polyps (including hyperplastic polyps, inflammatory polyp, lymphoid polyps, lipomatous polyps, and polyps with benign mucosa).^[14] Microscopically, adenomas are either conventional (villous, tubulovillous, or tubular), serrated, flat, or mixed. Villous adenomas are those containing more than 75% villous component. Villous component constitutes 25–75% of tubulovillous adenomas and <25% of tubular adenomas. Serrated adenomas contain epithelial serrations, basal crypt dilatation, abundant mucin, eosinophilic cytoplasm, boot-shaped or anchor-shaped crypts, and thin pencillate basal hyperchromatic nuclei. Low-grade dysplasia was defined as polyps with pseudo-stratifications (i.e., stratifications of nuclei not reaching the luminal cell surface), mitotic activity and dysplastic elongated nuclei and apical mucin. Polyps with high-grade dysplasia were those with stratified nuclei that reach the luminal cell surface, enlarged vesicular or hyperchromatic nuclei, prominent nucleoli, prominent atypical mitotic activity, crypts branching, cribriform glands, back-to-back glands, irregular budding, necrosis, and reduced mucin.^[15]

All gathered data were fed into a computer and analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 22.0. Results were presented in frequency tables. Mean, standard deviation, minimum, and maximum values were utilized to present discrete and continuous quantitative variables. Percentages were utilized to present frequencies.

RESULTS

During the study period, 211 of the patients who underwent colonoscopy in the University Hospital of Jeddah had colonic polyps and, therefore, were included in this study. The mean age of diagnosis of the recruited patients was 57.19 ± 13.2 (20–87) years. About two-thirds of these patients were males (66.8%) and about two-thirds had Saudi nationality (66.2%) [Table 1]. Only two patients (0.9%) had a positive family history of colonic polyps [Table 2].

Among the recruited patients, various indications for undergoing colonoscopy were found. It was noted that some patients had more than one indication for undergoing colonoscopy. The most common indications were regular surveillance if they had previously detected polyps (46.4%), a first degree relative with colonic polyps or neoplasm (33.6%), and a positive fecal occult blood test (22.3%). Other indications included (chronic) abdominal pain (20.4%), unexplained iron deficiency anemia (14.2%), bleeding per rectum (11.8%), and (unexplained) weight loss (3.8%). The vast majority (96.7%) of patients had a full colonoscopy study [Table 2].

As regards the physical appearance and characteristics of the detected polyps, three-quarter of the patients

had either one polyp (45.5%) or two polyps (29.9%). The maximum number of polyps found was 4 in 6.6% of the patients, and three polyps found in 18.0% of the patients. Most polyps were smaller than 1 cm (81.0%) in size, while only four (2.0%) patients had polyps larger than 2 cm. For six patients, the size of the polyp(s) was missing. Polyps were mostly found in the rectum/sigmoid (45.5%) and the left colon (30.3%). Only one-fifth of the polyps (21.3) was detected at the right colon, and as few as 6.6% were visualized at transverse/ascending colon. Eight patients had polyps in more than one of these locations. As regards the appearance, the vast majority of patients (82.6%) had sessile polyps, while only 16.4% had pedunculated. Only 1% had both sessile and pedunculated polyps. Information on the endoscopic appearance of polyps was missing in four patients [Table 3].

The histopathologic results of the examined polyps revealed that adenomatous type was the most prevalent histological type among 68.6% of patients. Of these, tubular, villous, tubule-villous, and mixed types were noted among 79.1%, 11.8%, 5%, and 4.5%, respectively. Non-adenomatous polyps constituted only 10.1% of the examined sample. Mild dysplasia was detected in almost half of the studied sample (42.3%) while moderate and severe grades of dysplasia were demonstrated in 19.2% and 38.5% of the examined polyps, respectively [Table 3]. More than 90% of the recruited patients had polyps removed during the colonoscopy, 20.1% were removed

Table 1: Demographic characteristics of the studied sample (n=211)

Demographics	n	Min	Max	Mean	SD
Age of Diagnosis	211	20	87	57.19	13.2
		Count	Percentage		
Total		211	100.0		
Age of Diagnosis	20-30	9	4.3		
	31-50	51	24.2		
	51-70	122	57.8		
	71-90	29	13.7		
Gender	Male	141	66.8		
	Female	70	33.2		
Nationality	Saudi	139	66.2		
	Non-Saudi	71	33.8		
	Missing	1	0.47		

Table 2: Clinical characteristics and indications of colonoscopy among the studies sample (n=211)

	Count	Percentage
Total	211	100.00
Family History		
	Yes	0.9
	No	99.1
Indication of colonoscopy		
Bleeding per rectum (PR)		
	Positive	11.8
	Negative	88.2
Occult Blood		
	Positive	22.3
	Negative	77.7
Unexplained Iron Deficiency Anemia		
	Positive	14.2
	Negative	85.8
Abdominal Pain (Chronic)		
	Positive	20.4
	Negative	79.6
Weight Loss (Unexplained)		
	Positive	3.8
	Negative	96.2
Family History of first-degree relation (with Colonic Polyps or Neoplasm)		
	Positive	33.6
	Negative	66.4
Surveillance colonoscopy with none of the above		
	Positive	46.4
	Negative	53.6
Full colonoscopy		
	Yes	96.7
	No	3.3

Table 3: Characteristics of the colonic polyps among the studied sample (n=211)

Variables	Count	Percentage		
Total	211	100.0		
Polyps	1 Polyp	96	45.5	
	2 Polyps	63	29.9	
	3 Polyps	38	18.0	
	4 Polyps	14	6.6	
Size of Polyp/s	<1 cm	166	81.0	
	>1-2 cm	35	17.1	
	>2 cm	4	2.0	
	Missing	6	2.84	
Endoscopic appearance	Pedunculated	34	16.4	
	Sessile	171	82.6	
	Pedunculated and Sessile	2	1.0	
	Missing	4	1.89	
Action	Biopsied Only	17	8.1	
	Removed	42	20.1	
	Biopsied and Remove	150	71.8	
	Missing	2	0.94	
If Removed:	All	183	95.3	
	Some	9	4.7	
Location of the Polyps	Rectum/Sigmoid	Yes	96	45.5
	No	115	54.5	
Left colon	Yes	64	30.3	
	No	147	69.7	
Right colon	Yes	45	21.3	
	No	166	78.7	
Transverse/Ascending	Yes	14	6.6	
	No	197	93.4	
Histological Type	No result	21	10.1	
	Non-adenoma	44	21.3	
	Adenomatous	142	68.6	
	Missing	4	1.89	
If Adenomatous:	Tubular	87	79.1	
	Tubulo-villous	5	4.5	
	Villous	13	11.8	
	Tubular and Villous	5	4.5	
Dysplasia	Missing	32	21.7	
	Mild	22	42.3	
	Moderate	10	19.2	
	Severe	20	38.5	
	Missing	90		

with cold biopsy forceps, and 71.8% were removed through snare polypectomy. Only a few patients (8.1%) had their polyps biopsied without removal. All polyps were removed in 95.3% of the patients whereas partial removal was carried out in 9 patients (4.7%) [Table 3].

Follow-up endoscopy was conducted in only one-third (39.1%) of the recruited patients. The follow-up period ranged from 6 months to 3 years. Among them, the number of follow-up colonoscopies

Table 4: Follow-up and outcome of colonic polyps among the studied sample (n=211)

	Count	Percentage		
Total	211	100.0		
Carcinoma <i>in situ</i>	Yes	9	4.7	
	No	181	95.3	
	Missing	21		
Cleared polyps	Yes	98	46.4	
	No	113	53.6	
Surgical Intervention	Yes	17	8.1	
	No	194	91.9	
Deceased	Yes	9	4.3	
	No	202	95.7	
Follow-up colonoscopy	Yes	75	39.1	
	No	117	60.9	
	Missing	19		
	<i>n</i>	Min Max Mean SD		
Number of colonoscopies	207	1 9	1.69	1.141
Number of years since first diagnosed with colonic polyposis	191	1 11	4.32	1.539

ranged from one to nine with a mean of 1.69 ± 1.41 . For the patients on regular follow-up, carcinoma *in situ* was detected in 4.7% of patients on follow-up, and those patients did not have any malignant features at baseline colonoscopy. About half of the patients (46.4%) had their polyps cleared, while 8.1% required surgical intervention. Mortality occurred in 4.7% of the recruited patients on follow-up [Table 4].

DISCUSSION

Identification of the nature of colonic polyps among a population is essential for the estimation of their potential risk to develop colorectal cancer.^[16] In this research, a detailed evaluation of the clinical features, physical characteristics, and histopathological findings was carried out to identify the nature of colonic polyps in Saudi Arabia. Colonic polyps were detected in patients of various ages. Although the mean age was in the sixth decade (57.19 ± 13.2 years), patients as young as 20 years and as old as 87 years had colonic polyps. In agreement with our results, researchers from the United States reported that around 40% of their patients who were diagnosed with colonic polyps were above the age of 50 years.^[17] In various literature studies, males were found to be more affected by colonic polyps than females.^[17,18] Similarly, more than two-thirds (66.8%) of our recruited samples were males. Though an exact etiology for the higher prevalence of colonic polyps among men remain elusive, several theories were proposed.^[19] Estrogen is proposed to have a protective effect against the development of colorectal polyp, and this action is mediated via estrogen receptor genes.^[20]

Reduced bile acid production in females is proposed to reduce the colonic mucosa irritation and subsequently colonic polyp formation, and insulin-like growth factors are thought to play a role.^[21] A family history of colonic polyps or colorectal cancer is a well-established risk factor for the development of colonic polyps and colectomy may be essential in some of these cases.^[22,23] Therefore, it is essential to identify a load of family history among patients undergoing colonoscopy as a predictor of outcome. In our study, a family history of colonic polyps was detected in less than 1% of the recruited sample.

The vast majority of colonic polyps are asymptomatic.^[24] However, they may present with frank bleeding per rectum, occult blood in stools, anemia, and/or alteration in bowel habits.^[25] In this study, about half of the patients studied (46%) had their endoscopy as routine surveillance for regular check-ups. Another third (34%) underwent colonoscopic examination because they had a first degree relative with colonic polyps/cancer which reflects their good health education.^[26] The remaining patients had various symptoms such as occult blood in stools, chronic abdominal pain, iron deficiency anemia, bleeding per rectum, and unexplained weight loss. In contrast, Long *et al.*, in their study of 1234 patients with colonic polyps, reported that alteration in bowel habits and abdominal pain were the most frequently reported manifestations in their symptomatic patients.^[27] More than 95% of the recruited patients had full colonoscopy indicating appropriate local awareness of the international guidelines of colonoscopy for screening and diagnosis of colorectal polyps and or cancer.^[28]

In agreement with various literature studies, the most common physical features of the colonic polyps in the Saudi population were being single rather than multiple, small in size, and sessile. In another hospital-based study conducted in Yat-sen University, Long *et al.* found that less than half of their patients (47.5%) had small polyps less than 5 mm.^[27] However, more than two-thirds of their patients had multiple polyps. In this study, the most common histopathological type of colonic polyps was the adenomatous type occurring in more than two-thirds of the cases. The tubular subtype is the most prevalent variant among Saudi patients with adenomatous polyps occurring in up to 80% of the cases. Villous, tubulovillous, and mixed types were far less common. The patterns of dysplasia were also studied among the Saudi population recruited to this research, and the results revealed that the mild form of dysplasia occurred in more than 40% of the cases. However, severe dysplasia was similarly common (38.5%). Similar to our findings, Long *et al.* reported that tubular polyps were

the most common histopathological type.^[27] Dell'Abate *et al.* reported that the small pedunculated adenomatous polyps were the most common.^[27]

“It is essential” to identify polyps with a high risk of malignant transformation for early detection of any potential danger.^[28,29] In our study, only 39% of the patients had follow-up endoscopy, and about 4.7% had carcinoma *in situ*. Though the number is small, the actual proportion of patients who have the risk for transformation to malignancy and the risk factors for malignant transformation could not be assessed in our study due to insufficient available follow-up data. In literature, the risk of cancer transformation in patients with high-grade dysplasia was 35%.^[30] Thus, it is recommended that healthcare authorities enhance the public and patients' awareness about the importance of regular surveillance. The general outcome of colonic polyps in the Saudi population seems to be favorable. About 8% of the patients required surgical intervention and 4.7% had carcinoma *in situ*.

The main strength of this study is that, to our knowledge, this is the first descriptive study of the clinical features, growth characteristics, and microscopic nature of colonic polyps in Saudi Arabia. It had also included patients of different ages and various polyp sizes, types, and numbers. On the other side, the main limitation is that it was conducted at a single center and thus, the results cannot be generalized. Future multicentric prospective studies are recommended for further identification and evaluation of the patterns of colonic polyps and their long-term outcomes.

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Conflicts of interest

There are no conflicts of interest.

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