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Research Article

**FREQUENCY, LOCATION AND HISTOPATHOLOGICAL  
TYPES OF COLORECTAL POLYPS IN PATIENTS  
UNDERGOING COLONOSCOPY****Kailash Raj Makhejani<sup>1</sup>, Sanaullah Kalwar<sup>2</sup>, Jamil Ahmed<sup>3</sup>, Liaquat Ali Halo<sup>4</sup>**

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**Abstract:**

*It is widely accepted that the adenoma carcinoma sequence represents the process by which most, if not all, colorectal cancers arise. Our study aimed to determine the frequency, location and histopathological types of colorectal polyps in patients undergoing colonoscopy. A Cross sectional descriptive study was conducted at Department of Gastroenterology, Liaquat National from 11<sup>th</sup> September 2014 to 10<sup>th</sup> March 2015. Total 150 patients of both gender and age 16-50 years, with history of rectal bleeding/hematochezia and altered bowel habits were included in the study. All patients were evaluated through Colonoscopy and were diagnosed as having colorectal polyp if there was protrusion from colorectal mucosal surface during colonoscopy and its exact location was noted. Mucosal biopsy specimen was taken for histopathology. All the relevant information were entered on predesigned proforma. SPSS version 17 was used for data compilation and analysis. Mean±SD were calculated for qualitative variables. The participants mean age was 38.55±10.42 years, with range 34(16–50) years. The mean duration of symptoms was 5.73±2.54 months. The colorectal polyp was found in 46.7% cases. 74.3% colorectal polyps were at left site and 25.7% were at right site. It was revealed that, colorectal polyps are common in local population with 45.7% than in the West. It was observed that 71.5% were adenomas polyps, 11.4% were hyperplastic polyps, 5.7% were hamartomas, 5.7% were lymphoid aggregates, and 5.7% were inflammatory polyps. Adenomatous polyps are the predominant histological type, and more than 70% of polyps are located in the left colon.*

**Keywords:***Histopathological Types, Colorectal Polyps, Colonoscopy**Correspondence author: Kailash Raj Makhejani, Karachi Adventist Hospital, Karachi, Pakistan**Email I.D: kailash.makhejani@uhn.ca***Corresponding author:****Kailash Raj Makhejani,***Karachi Adventist Hospital, Karachi*

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**INTRODUCTION:**

The term polyp of the colon refers to a protuberance into the lumen from the normally flat colonic mucosa. Polyps are usually asymptomatic but may ulcerate and bleed, cause abdominal pain, and, when very large, produce intestinal obstruction. Colonic polyps are usually classified as neoplastic, hamartomatous, nonneoplastic, and submucosa. Hyperplastic polyps are the most common nonneoplastic polyp in the colon. They are small nodules or polypoid lesions composed of normal cellular components that may be indistinguishable grossly from adenomatous polyps. They do not exhibit dysplasia and have a characteristic stellate histologic appearance on cross section. Hyperplastic polyps are typically located in the left colon and are less than 5 mm in size.<sup>1,2</sup> They only rarely develop into colorectal cancers. Multiple studies have evaluated the risk of proximal neoplasms in patients found to have distal hyperplastic polyps.<sup>3,4</sup> A systematic review that included 18 studies estimated that 21 to 25 percent of patients found to have a distal hyperplastic polyp had a proximal neoplasm.

Inflammatory pseudopolyps are irregularly shaped islands of residual intact colonic mucosa that are the result of the mucosal ulceration and regeneration that occurs in inflammatory bowel disease (IBD). These polyps are typically multiple and scattered throughout the colitic region of the colon.<sup>2</sup>

Inflammatory pseudopolyps are irregularly shaped islands of residual intact colonic mucosa that are the result of the mucosal ulceration and regeneration that occurs in inflammatory bowel disease (IBD). These polyps are typically multiple and scattered throughout the colitic region of the colon.<sup>1</sup>

Two-thirds of all colonic polyps are adenomas, which are common in the general population. They are by definition dysplastic and thus have malignant potential. Nearly all colorectal cancers arise from adenomas, but only a small minority of adenomas progress to cancer. Approximately 30 to 40 percent of the United States population over the age of 50 have one or more adenomas whereas the cumulative colorectal cancer risk is about 5 percent. Nevertheless, the detection and removal of adenomatous polyps significantly decrease the morbidity and mortality associated with colorectal cancer.<sup>4</sup>

Age is a major risk factor for the development of colonic adenomas. Colonoscopic screening studies in asymptomatic people suggest that the prevalence of

adenomas is about 25 to 30 percent at age 50<sup>5</sup> and autopsy studies have found rates as high as 50 percent by age 70.<sup>6</sup> Adenomatous polyps are more common in men (Rex et al., 1995). An adenoma that is diagnosed at the same time as an index colorectal neoplasm is called a synchronous lesion. One that is diagnosed at least six months later is considered metachronous. Thirty to 50 percent of colons with one adenoma will contain at least one other synchronous adenoma.<sup>7</sup>

The location of adenomatous polyps has important implications for screening programs. During the last decades, a shift in anatomic distribution of polyps from the left to the right colon has been inferred from longitudinal studies of metachronous colorectal cancer location. Preliminary, retrospective data suggest that the African-American population may be most predisposed to the occurrence of right-sided colonic adenomas.<sup>8</sup> Advancing age is also a risk factor for right-sided polyps and cancers.<sup>9</sup>

The histologic features and size of colonic adenomas are the major determinants of their malignant potential. The glandular architecture of adenomas is characterized as tubular, villous, or a mixture of the two.<sup>10</sup> Tubular adenomas account for more than 80 percent of colonic adenomas. They are characterized by a network of branching adenomatous epithelium. To be classified as tubular, the adenoma should have a tubular component of at least 75 percent. Villous adenomas account for 5 to 15 percent of adenomas and . They are characterized by glands that are long and extend straight down from the surface to the center of the polyp. To be classified as villous, the adenoma should have a villous component of at least 75 percent. Tubulovillous adenomas, having 26 to 75 percent villous component, account for 5 to 15 percent of adenomas.<sup>1</sup>

Polyps are further categorized as sessile if the base is attached to the colon wall, or pedunculated if a mucosal stalk is interposed between the polyp and the wall. Small polyps (<5 mm, also known as diminutive) are rarely pedunculated. It is important to appreciate that while adenomas are most commonly found within raised lesions, up to 27 to 36 percent are flat.<sup>10,11,12</sup>

The data on the prevalence and distribution of polyps in Asians is limited. Data from India suggests that the prevalence of CP is about 2%<sup>14</sup> and they occur in relatively younger patients.<sup>15</sup> There is conflicting data about the commonest type.<sup>15,16</sup> In Thailand, the commonest type was hyperplastic polyps<sup>17</sup> while it

was juvenile polyps in Cameroon<sup>18</sup> and adenomatous polyps in Iran<sup>19</sup> and Saudi Arabia.<sup>20</sup> There is no data available on CP in Pakistan. Data on the prevalence of colorectal cancer (CRC) is available in relative abundance, even in Asian countries, despite having the lowest incidence in the world.<sup>21,22</sup> In Sri Lanka, the crude rate is 4 per 100,000<sup>21</sup> while it is approximately 2 per 100,000 in India and 3 per 100,000 in Thailand.<sup>21,22</sup>

Most colonic adenomas are asymptomatic and due to the widespread character of this phenomenon and the risk of malignancy, many nations have introduced screening programs for early detection of colonic adenomas. Colonoscopy is the 'gold standard' method of detecting intra-luminal colonic lesions. However, its sensitivity is not 100%. Several studies have demonstrated a variable 'missed' polyp rate.<sup>23</sup> One systematic review included six studies covering a total of 465 patients who underwent two same-day colonoscopies. The 'miss' rate for polyps of any size was 22%, adenoma miss rate by size was 2.1% for adenomas >10mm, 13% for adenomas 5–10mm and 26% for adenomas 1–5mm.<sup>24</sup>

Other studies have shown similar results. Still, because most large villous polyps are distributed throughout the left colon, screening flexible sigmoidoscopy every five years, beginning at age 50, is recommended by the World Health Organization and others.<sup>25</sup> Another screening strategy, recommended by the American Cancer Society, is full colonoscopy every ten years, beginning at age 50.<sup>26</sup> The detection and removal of adenomatous polyps identified through colonoscopy significantly decrease the morbidity and mortality associated with colorectal cancer.<sup>23,24</sup>

Extensive literature review has revealed that there is a dearth of studies related to colorectal polyps in Pakistan. In addition, the incidence of colorectal cancer is unknown locally. A better understanding of the facts and figures would allow identification of those subjects who are predisposed to this cancer and, therefore will be benefitted from further management plan according to specific Histopathological type of polyp.

#### **MATERIAL AND METHODS:**

A Cross-sectional study was conducted at Department of Gastroenterology, Liaquat National Hospital Institute for Postgraduate Medical Studies and Health Sciences, Karachi from 11<sup>th</sup> September 2014 through 10<sup>th</sup> March 2015. The sample size was calculated by

taking the least proportion i.e. 5%, with confidence level 95% and margin of error 3.5%, the sample size will be 150 recruited using Non-probability consecutive sampling. The sample selection criteria include both genders of age between 16 to 50 years patients with history of rectal Bleeding/Hematochezia, altered bowel habits and patients who agreed to give consent for participation in the study. The patients suffering from intestinal obstruction, having intestinal perforation, severe ileus, electrolyte imbalance, recent gastrointestinal surgery, pregnant females, patients with family history of colorectal cancer, chronic constipation, melena or stool for occult blood positive were excluded from this study. Data were collected from patients with rectal bleeding, altered bowel habits and meeting inclusion and exclusion criteria; attending Gastroenterology out and in patient department. Informed consent was taken prior to inclusion in the study. All patients; meeting the criteria were evaluated for colorectal polyps by undergoing Colonoscopy performed by GI fellows having at least 1 year experience under the supervision of consultant gastroenterologists having at least > 05 years clinical experience. Patients were diagnosed as having colorectal polyp if there was protrusion from colorectal mucosal surface during colonoscopy and its exact location was noted. Mucosal biopsy specimen was taken during colonoscopy in Formalin containing bottles, labeling those accordingly and was sent to the same clinical laboratory for histopathology examination for the classification. To control the confounders histopathological evaluation of all the samples were reported by a single histopathologist; having at least 5 years of clinical experience in histopathology. All the relevant information were entered on the annexed proforma. Statistical package of social science (SPSS 17) for windows was used to analyze data. Mean±SD were calculated for quantitative variables like age and duration of symptoms. Frequencies and percentages were calculated for qualitative variables like gender, presence or absence of colorectal polyp, site of colorectal polyp, histopathological type and clinical presentation. Ratio (M:F) was computed to present gender. Additionally; age, gender, duration of symptoms and clinical presentation were stratified to control the confounders. Post stratification Chi-square test was applied. For all analysis, P value ≤0.05 was considered statistically significant.

#### **RESULTS:**

Total 150 patients of either gender with age between 16 – 50 years, had history of rectal bleeding/

hematochezia and altered bowel habits were included in the study to determine the frequency, location and histopathological types of colorectal polyps in patients undergoing colonoscopy. SPSS version 17 was used for data compilation and analysis. Chi square test was

applied post stratification to observe the effect of modifiers on outcome. P value  $\leq 0.05$  was considered as significant. The results showed that there were 83 male and 67 female patients in the study. The frequency distribution is presented in Table-1.

Table:1 Descriptive Statistics Of Age (years)

Type of test	AGE (n=150)
Mean $\pm$ SD	38.55 $\pm$ 10.42
95%CI (LB – UB)	36.87 – 40.23
Median (IQR)	43.00 (17.3)
Range	34.0
Minimum	16.0
Maximum	50.0

The mean age of study subjects was 38.55 $\pm$ 10.42 years, with range 34(16–50) years. The distribution of age is presented in Graph-1. The detailed descriptive statistics of age is presented in Table-2. The age was stratified in two groups. Age of 65 patients was  $\leq 40$  years and age of 85 patients was  $>40$  years. The mean duration of symptoms was 5.73 $\pm$ 2.54 months, with range 8(1–9) months. The duration was stratified in two groups. The duration of 67 patients was  $\leq 5$  months and duration of 83 patients was  $>5$  months. The results showed that out of total study subjects, 93 were in-patients and 57 were out door patients. As far as clinical presentations are concerned it was observed that rectal bleeding was observed in 67.3% patients and altered bowel habits were found in 86.7% patients. The family history of colorectal polyp was found in 76.7% cases. The frequency distribution is presented in Table-2.

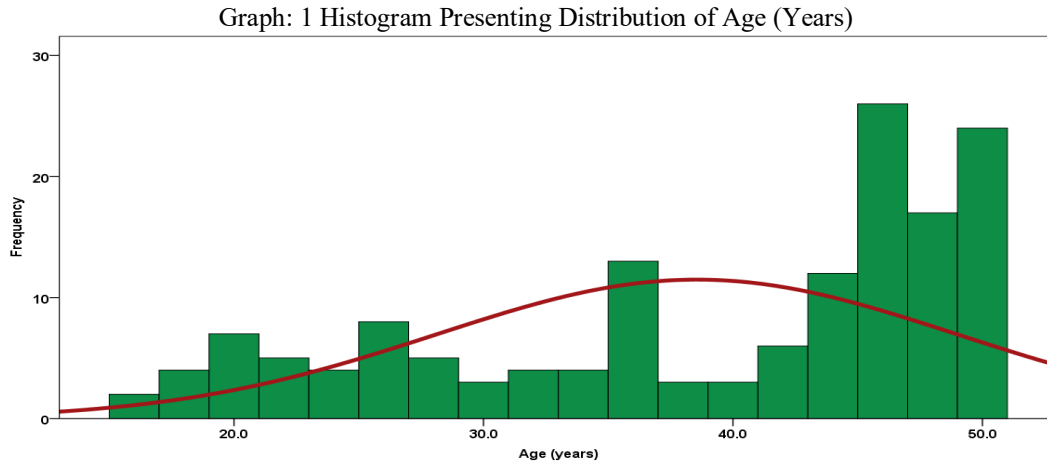
Table: 2 Frequency Distribution Of Family History Of Colorectal Polyp

	Frequency (n)	Percentage (%)
YES	115	76.7%
NO	35	23.3%
TOTAL	150	

The final outcome i.e. colorectal polyp was found in 46.7% cases. The results showed that 74.3% colorectal polyps were at left site and 25.7% were at right site. As far as the histopathological types of colorectal polyps are concerned, it was observe that 71.5% were adenomas polyps, 11.4% were hyperplastic polyps, 5.7% were hamartomas, 5.7% were lymphoid aggregates, and 5.7% were inflammatory polyps. Stratification with respect to gender, age, duration of symptoms, clinical presentation and family history of colorectal polyps was done to observe effect of these modifiers on outcome. Post stratification Chi square test was applied and p-value  $\leq 0.05$  was considered as significant. The result showed association of colorectal polyp was significant with age ( $p=0.015$ ), rectal bleeding ( $p=0.002$ ), altered bowel habits ( $p=0.002$ ), and family history of colorectal polyps ( $p=0.014$ ).

Table: 3 Frequency distribution of Histopathological types of colorectal polyp

Histopathology	Frequency (n+70)	Percentage (%)
Adenomas Polyps	50	71.5%
Hyperplastic polyps	8	11.4%
Hamartomas	4	5.7%
Lymphoid Aggregates	4	5.7%
Inflammatory Polyps	4	5.7%
Total	70	



The association of colorectal polyp was found not significant with gender ( $p=0.160$ ), and duration of symptoms ( $p=0.059$ ).

Table: 4 Descriptive Statistics Of Age (Years) According To Age Groups

Type of tests	$\leq 40$ years (n=65)	$> 40$ years (n=85)
Mean $\pm$ SD	28.12 $\pm$ 6.97	46.52 $\pm$ 2.68
95%CI (LB – UB)	26.39 – 29.85	45.95 – 47.10
Median (IQR)	28.00 (13.5)	46.00 (4.0)
Range	24.0	9.0
Minimum	16.0	41.0
Maximum	40.0	50.0

Table:5 Frequency distribution of histopathological types of colorectal polyp

	Frequency (n=70)	Percentage (%)
Adenomas Polyps	50	71.5%
Hyperplastic polyps	8	11.4%
Hamartomas	4	5.7%
Lymphoid Aggregates	4	5.7%
Inflammatory Polyps	4	5.7%
TOTAL	70	

Table: 6 Frequency and association of colorectal polyps according to altered bowel habits

	Colorectal Polyps		Total	P-value
	Yes (n=70)	No (n=80)		
Yes (n=130)	65	65	130	0.002*
No (n=20)	5	15	20	
Total	70	80	150	

P-value  $\leq 0.05$  considered as significant

A colorectal polyp is an abnormal protrusion of the mucosa into the bowel lumen that is classified by histopathological examination. Adenomas are a common finding during colonoscopy in symptomatic patients and in asymptomatic individuals undergoing screening. Adenomas are important as they are the precursor lesion of most colorectal cancers arising through the adenoma carcinoma sequence<sup>23-28</sup>.

Colon carcinomas mostly arise from adenomatous polyps and the time span for the transition process is estimated to nearly 10 years on average.<sup>14-15</sup> Given the slow progression of colorectal adenomas into invasive adenocarcinoma, early detection and endoscopic resection of these precancerous lesions, have been claimed to be effective in decreasing both the incidence and mortality rate of CRC.<sup>116</sup> There is a report that colonic precancerous lesions (adenomas) with a high prevalence tend to present at younger ages, therefore undergoing screening among asymptomatic adults aged 50 years for adenomas and CRC is strongly recommended<sup>24</sup>.

There is scant knowledge about the prevalence of colorectal polyps and their characteristics in Pakistani population. To the best of our knowledge, only few studies are available in the regional literature that assessed colorectal polyps in Iran and India<sup>12-18</sup>. Hence, identifying the features of colon polyps (e.g., age of onset, changes in sub-sites distribution, location, and histology type) have great implications for developing national screening guidelines. The aims of the current study was to evaluate the clinical and histological characteristics of colorectal polyps in a Pakistani population. Nevertheless, this study provides comprehensive information about clinical and epidemiological features of colorectal polyps, using an adequate sample of patients undergoing colonoscopy<sup>12-14</sup>

The prevalence of colorectal polyps in this study is 46.7%. The histologic features of lesions that were identified on endoscopy were categorized according to those of the most advanced lesion removed proximally (up to the junction of the splenic flexure and the descending colon) and the most advanced lesion removed distally. Among those who underwent colonoscopic screening, it was observed that 71.5% were adenomas polyps, 11.4% were hyperplastic polyps, 5.7% were hamartomas, 5.7% were lymphoid aggregates, and 5.7% were inflammatory polyps. Older age is the most important predictor for the

prevalence of neoplastic adenomas, and cancer<sup>25-28</sup>. In our study, the neoplastic (adenomas) were prevalent among older patients. These data are consistent with findings reported by Bafandeh, Mirzaie, and their colleagues<sup>20-25</sup>. Studies from the Middle East and the western countries also mentioned significant increase for the risk of CRC, in particular after the age of 50 years.<sup>122</sup> Given the increased prevalence of CRC in the sixth decade of life, the age threshold to start screening for individuals with average risk is 50 years<sup>27-30</sup>.

The major limitation of our study was the absence of automated interface between our pathology reports and endoscopic database, which prevented us from estimating the detection rate of adenoma, and addressing the predictive factors for them. Finally, our sample included mostly symptomatic patients, in which the estimates may be different from screening studies with asymptomatic individuals. This is a nonrandomized study with relatively less number of patients.

#### CONCLUSION:

Colorectal polyps are a common finding in screening colonoscopies. Most of these are of no clinical significance but, due to their high prevalence, the minority of such polyps that bear a malignant potential still represents a central issue in preventive medicine. Early identification and removal of these lesions is a highly effective method of preventing morbidity and mortality from colorectal carcinoma. The diagnosis of a colorectal polyposis syndrome is initially suggested, based on colonoscopic findings and polyp histology. In this study we found that, Colorectal polyps are common in local population with 45.7% than in the West. As in the West, adenomatous polyps are the predominant histologic type, and more than 70% of polyps are located in the left colon.

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