

## Detection of Colonic Polyps During Colonoscopy in a Tertiary Care Center of Nepal

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### ABSTRACT

**Background:** Colorectal cancer is the third leading cause of cancer death in the world. Most colon cancer develop from the polyps. Data on the prevalence of colorectal polyps in Nepal is lacking. The objective was to determine the prevalence of colorectal polyps, site of occurrence and adenomas among various age groups. All polyps after removal by polypectomy was sent for histopathological examination.

**Methods:** Study was done in 1027 consecutive patients who underwent colonoscopy in the pre-specified time after excluding patients with colorectal cancer, Inflammatory Bowel Disease and polyposis syndromes.

**Results:** Among 1027 patients, the mean age was 45 years. 292 (28.43%) were below 40 years, whereas, 735 (71.57%) were above 40 years. Polyps were detected in 12.95% of overall patients and in 9.73% of patients over age 40. The most common location of polyps was rectum (46.62%). 43.61% were adenomatous polyps, 11.28% were hyperplastic polyps, 18.05% were juvenile polyps, 22.56% were inflammatory polyps and 1.50% were malignant adenocarcinoma. Polyp detection rate was 12.95%, whereas adenoma detection rate was 5.84%. 46.55% had advanced adenomas. A positive correlation between the size of polyp and adenomatous variety was found [Chi-square value  $\chi^2 = 8.42 (>3.841)$ , p value  $<0.05$ ]. Prevalence of adenomatous polyps was significantly higher above the age of 40 [Chi-square value  $\chi^2 = 11.53 (>3.841)$ , p value  $<0.05$ ].

**Conclusions:** The prevalence of polyp increases with age. With increasing age and size of polyp, the prevalence of adenomatous polyp increases significantly. One out of every eight people over 40 years had a colonic polyp.

**Keywords:** Colorectal cancer; colonoscopy; colonic polyp; screening

### INTRODUCTION

Colorectal cancer (CRC) is the third leading cause of cancer death in the world.<sup>1</sup> A colorectal polyp is believed to be a precursor to almost all colonic carcinomas.<sup>2</sup> Autopsy studies from various parts of the world have described the prevalence rates of colorectal adenomas ranging from 22 to 61%.<sup>3</sup>

Advanced adenomas are defined as any adenoma  $\geq 10$  mm size or with  $> 25\%$  villous histology or high-grade dysplasia and have high malignant potential.<sup>4</sup> The time interval for the polyp to cancer progression process is considered to be an average of 10 years thus early detection and removal of polyps is of proven benefit in preventing CRC.<sup>5,6</sup> The prevalence rate of colorectal polyps well defined in the western world. Two studies done in Nepal by Kidwai et al. and Chaudhary et al. showing a prevalence of 15.51% and 6.67% respectively but these studies had a small sample size.<sup>7,8</sup> Thus, this

study was conducted to determine the prevalence of colorectal polyps in Nepal with a greater sample size in a tertiary care center in Nepal.

### METHODS

It is a cross sectional study of patients over 16 years of age who had undergone colonoscopy during September 2019 to January 2021. Ethical approval was taken from Institutional Review Committee (IRC) of Institute of Medicine (IOM).

Patients with known history of Inflammatory Bowel Disease (IBD), polyposis syndromes and colorectal cancer were excluded from the study because these patients have a higher prevalence of polyps due to the inherent nature of their primary disease, and often undergo colonoscopy with an already established diagnosis. We considered the parameters age, gender, indication of colonoscopy and diagnosis. Indications for colonoscopy

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included blood in stool, altered bowel habits, chronic diarrhea, chronic constipation, unexplained iron deficiency anemia (IDA), lower abdominal pain, to exclude colorectal cancer prior to haemorrhoidectomy, abnormal radiographic findings of abdomen, and screening for colorectal cancer/polyps as indicated by age of the patient.

Colonoscopy was performed using Pentax Eg29i10 endoscope with Pentax Epsi5000 video processor. After achieving successful caecal intubation, meticulous examination was carried out during withdrawal of the colonoscope. When a polyp was detected, its location and morphology were noted. Its morphology was classified as per Paris endoscopic classification of superficial neoplastic lesions. Morphology was classified as per Paris endoscopic classification of superficial neoplastic lesions which classifies polyps into Ip, Ips, Is, Ila, Ilb, Ilc, Ila+c, Ilc+a and III.<sup>9</sup> Polypectomy was performed. The specimen was kept in a labeled bottle with the site of colon noted. The same protocol was performed for each polyp and for each colonoscopy. The specimen bottles were sent to Department of Pathology as per protocol for histopathological evaluation.

For the colonoscopic examination, each patient was advised about bowel preparation by avoiding fibrous diet

for prior few days with intake of soft diet. On the day prior to colonoscopy patients were advised to take two bisacodyl tablets (total 10 mg) before sleep and two liters of polyethylene glycol (PEG)-based electrolyte solution on the morning of procedure. This was followed by intake of plenty of fluids including ORS (Oral Rehydration Solution). These preparations were advised by trained nurses along with a printed instruction. Most of the patients did their bowel preparation at home, while a few admitted patients were prepared in the hospital All procedures were done without sedation after informed consent. Being awake would enable the patient to cooperate with verbal instructions during the procedure which would make procedure easy despite some amount of discomfort to the patient. After the procedure, patients were observed for half an hour in the recovery room for the presence of procedural complications and discharged.

Data of the patient was collected in a preformed proforma. All statistical analyses were carried out using Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Office Excel 2016. Chi-square test ( $\chi^2$ ) was applied to evaluate the correlation between various variables with p value <0.05 considered as statistically significant.

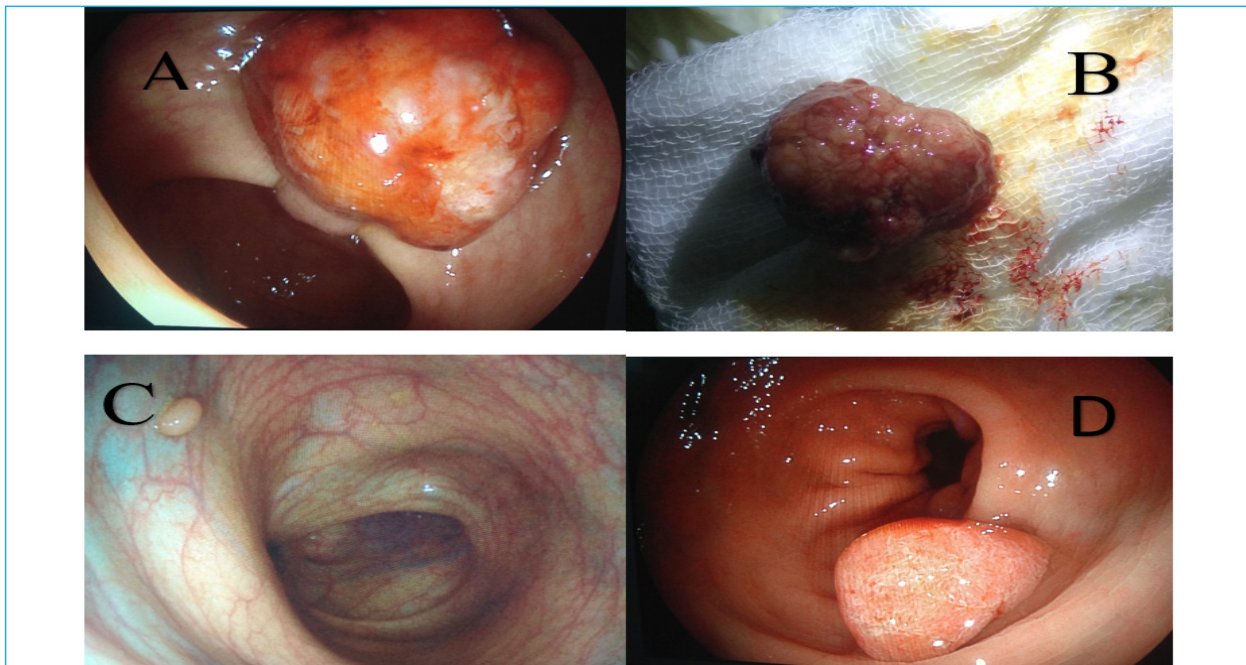


Figure 1. A: Colonoscopy showing single pedunculated polyp at sigmoid colon B: Resected sample of polyp. Histology later revealed tubular adenoma with low grade dysplasia. C: Colonoscopy showing single sessile polyp at splenic flexure. Histology later revealed hyperplastic polyp. D: Digital Image Enhanced Endoscopy (I-scan imaging) showing oval, tubular and branched white structures on the surface of polyp suggesting adenomatous variety in histology. Biopsy later revealed adenomatous polyp.

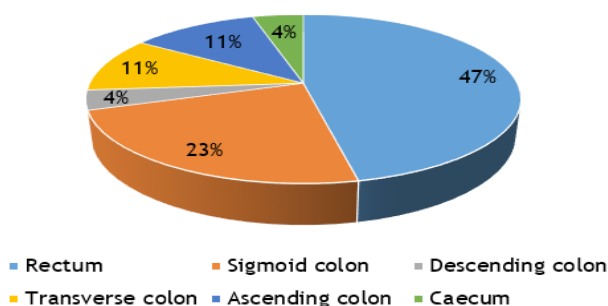
**RESULTS**

A total of 1027 colonoscopies were performed in Department of Gastroenterology, TUTH in the specified time, of which 133 patients had colonic polyps (Figure 1). The patients were classified into 5 groups on the basis of age: age under 30yrs, 30-39yrs, 40-49yrs, 50-59yrs and 60yrs and above, for evaluating the variation of the prevalence of polyps according to age (Table 1). If more than one polyp detected in a single patient, it was referred only as one for calculating prevalence of polyp. If both adenoma and hyperplastic polyp were found in one single patient, adenoma was counted and hyperplastic polyp was omitted, in order to determine the true prevalence of adenoma which is the more important one. The mean age was 45 years (range 16-92 years). In the study, 292 (28.43%) were below 40 years of age, whereas, 735 (71.57%) were above 40 years. Polyps were detected in 133 (12.95%) of all patients and in 3.21% and 9.73% of patients below and above 40 years of age respectively.

**Table 1. Age-wise distribution of population**

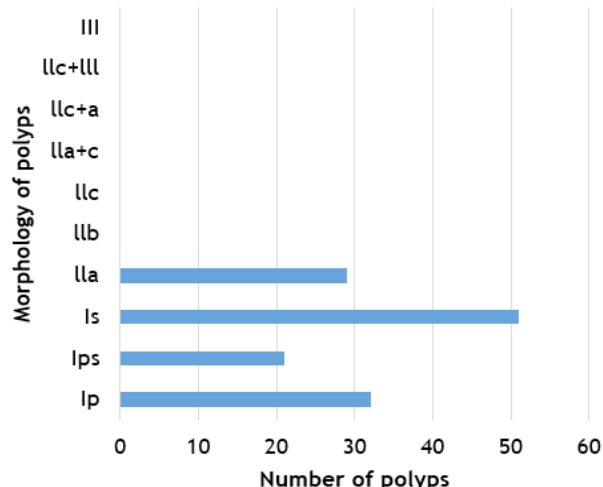
Age (years)	Frequency	
	N	%
<30	90	8.76%
30-39	202	19.67%
40-49	181	17.62%
50-59	286	27.85%
>/=60	268	26.10%
Total	1027	100.00%

The most common location of polyps was rectum (47.00%) (Figure 2). Altered bowel habit was the most common indication for colonoscopy followed by pain abdomen, blood in stool, chronic diarrhea, evaluation of IDA, chronic constipation, abnormal abdominal radiographic investigation and screening colonoscopy for CRC/polyp. True screening colonoscopies (in asymptomatic patients for screening purpose only done as per patients' request) revealed polyps in 17 cases only.



**Figure 2. Distribution of polyp according to site of colon**

Morphological assessment of polyps was done according to Paris classification<sup>9</sup> which showed Is, Ip, Ila and Ips occurred in 38.34%, 24.06%, 21.82% and 15.78% respectively (Figure 3).



**Figure 3. Morphology of polyps according to Paris endoscopic classification of superficial neoplastic lesions.<sup>9</sup>**

On reviewing the types of polyps, 58 (43.61%) were adenomatous polyps, 15 (11.28%) were hyperplastic polyps, 24 (18.05%) were juvenile polyps, 30 (22.56%) were inflammatory polyps and 2 were malignant adenocarcinoma (1.90%) (Table 2).

**Table 2. Types of polyp.**

Polyps	Frequency	
	N	%
Adenomatous	58	43.61%
Inflammatory	30	22.56%
Juvenile	24	18.05%
Hyperplastic	15	11.28%
Malignant adenocarcinoma	2	1.50%
Lymphoid	1	0.75%
Submucosal lipoma	3	2.26%
Total	133	100.00%

Polyps were detected in 18.88% of patients in the age group below 30 years but only 3.33% were adenomatous polyp. Among the 30-39 age group, polyps were detected in 7.92% patients. Above the age of 40, the prevalence of polyps was 12.15% in 40-49 age group, 9.09% in 50-59 age group and 20.14% in 60 years and above age group.

The age-wise distribution of adenomas as per total detection of polyp was as follows: 2.25% in the below 30 age group, 2.25% in 30-39 age group, 6.01% in 40-49 age

group, 8.27% in 50-59 age group and 24.81% in 60 years and above age group (Figure 4). These results implicate a higher risk of adenomatous (precancerous) polyps in above 40 years' age group. Overall, the polyp detection rate (PDR) was 12.95%, whereas the adenoma detection rate was 5.84%. Out of all the adenomas identified, 46.55% were advanced adenomas. Our study showed a positive correlation between the size of polyp and adenomatous variety and it was statistically significant [Chi-square value  $\chi^2 = 8.42$  ( $>3.841$ ) for 95% level of confidence for degree of freedom 1, p value  $<0.05$ ].

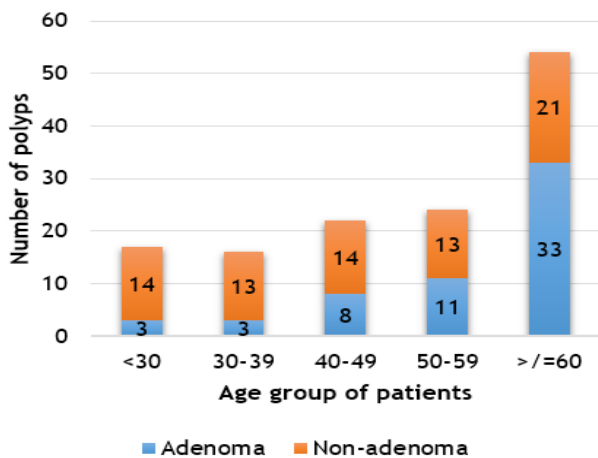


Figure 4. Occurrence of polyps according to age

The majority of adenomatous polyps detected were found in the left side of the colon (75.00%) compared to the right side of the colon (25.00%). The most common site of adenomatous polyp in the left colon was rectum which comprised 41.37% of the total cases. Also, it was found that the adenomatous polyps found in the rectum were more of advanced variety as compared to the adenomas detected on the other sites of the colon. Prevalence of adenomatous polyps increased significantly above the age of 40 years which is significant statistically [Chi-square value  $\chi^2 = 11.53$  ( $>3.841$ ) for 95% level of confidence for degree of freedom 1, p value  $<0.05$ ] (Table 3).

Table 3. Distribution of adenomatous polyps according to age

Age in years	N	Number of adenomatous polyps	Chi-square value $\chi^2$	p-value
<40	292	6	11.53	<0.05
$\geq 40$	735	52		

On reviewing the histology of adenomas, 74.13% were of tubular histology, 15.51% were of tubulovillous histology and 10.34% were of villous histology. With regards to dysplasia of adenomatous polyps: 48.27% had no

dysplasia, 32.75% had low grade dysplasia and 18.96% had high grade dysplasia.

Polypectomy was done by using various techniques in our study. Hot snare polypectomy with adrenaline injection was the most common method used for polypectomy which comprised 31.57% of patients. The other methods used were hot snare polypectomy (24.81%), cold snare polypectomy (18.04%), biopsy polypectomy (21.05%), cold snare polypectomy with adrenaline injection (3.00%), and hot snare polypectomy with adrenaline injection with hemoclip application (1.50%).

Significant complications were observed in only two patients. One patient developed bleeding which was managed conservatively and was discharged after a few days of admission. The other patient developed perforation and underwent emergency laparotomy. Among rest of the polypectomies done, there was no significant side effects except for mild pain and nausea which subsided itself.

DISCUSSION

Colonic polyps are one of the most common found lesions during a colonoscopic procedure. The prevalence of colonic polyps in our study was 12.95% whereas it was 3.21% and 9.73% for patients below and above 40 years of age respectively. The prevalence of colonic polyps done was 6.67% in a study done in Western Nepal.<sup>7</sup> Polyps mostly occurred at rectum (47.00%) in our study. More than one third of the polyps were sessile in nature. 43.61% of the detected polyps were adenomatous polyps whereas two patients had malignant adenocarcinoma (1.90%) in their polyps. Overall, the polyp detection rate (PDR) was 12.95%, whereas the adenoma detection rate was 5.84% in our study. The presence of adenomatous histology in polyp raised with the increase in the size of polyp in our study. The polyps found in the left sided colon in our study were found to be more of adenomatous in nature. Also, on reviewing the size and location of polyps, rectal polyp and polyp larger than 1 cm are more likely to be adenomatous. This study also highlights a noteworthy finding that, over the age of 40 years there is a significant increase in the prevalence of colonic polyps be it a polyp of adenomatous variety or other histology. The diagnosis of colorectal cancer has been in an increasing trend in Nepal.<sup>10,11</sup> Thus, by following the protocol of screening colonoscopy after the age of 40 years would seem a good method of early diagnosis of polyp and colorectal cancer in Nepal.

The existing colon cancer and polyp data from Nepal is not rigid. A single study done in Western Nepal in 60

patients showed colonic polyps in 4 (6.67%) patients whereas in other study done in Nepalgunj, polyps were detected in 15.51%.<sup>7,8</sup> Nevertheless, these studies had a small sample size. Another study in Kathmandu in 140 Irritable Bowel Syndrome (IBS) patients showed colonic polyps in 8 patients (5.71%).<sup>12</sup> This study primarily focused in IBS patients and had a small sample size as well. Besides, colonoscopy was not widely available previously as now which could have led to falsely low determination of polyps and colorectal cancer in Nepal. In contrast to the developed countries, screening colonoscopy for an asymptomatic individual is not yet widely practiced in Nepal. On the other hand, our study reports the detection of colonic polyps among patients who underwent colonoscopy in definite duration rather than a target number of patients. Patients with known colorectal cancer, Inflammatory Bowel Diseases and polyposis syndromes were excluded from the study, because these patients have a higher prevalence of polyp due to the inherent nature of their primary disease, and often undergo colonoscopy with an already established diagnosis. The most common precursor of colorectal carcinoma is a colonic adenoma. It has been an established fact that screening asymptomatic patients for colonic adenomas reduces long-term morbidity and mortality from colorectal cancer.<sup>13</sup> Advanced adenomas (defined as adenoma  $\geq$  10 mm size or with  $>$  25% villous histology or high-grade dysplasia) have the highest malignant potential as compared to non-advanced adenomas.<sup>5</sup> In our study, polyps were detected in 13.60% of patients over 40 years of age, of which 7.07% were of adenomatous histology. Out of the adenomas identified, 33.08% were found to be of advanced adenomatous variety. These findings correlate with reports of increasing colorectal cancer in Nepal.<sup>10</sup> In our study, the ratio of left-sided to right-sided adenomas were about 70:30. This data is in accordance with the findings of Peedikayil MC et al. who found that 74% of colorectal cancers in South India were left-sided considering these CRC developed from an adenomatous polyp.<sup>14</sup> The lower age of onset of colonic adenomas found in our study also correlates well with the findings of Peedikayil MC et al, who reported that 12.7% of colorectal cancers in South India were identified in below 40 years of age.<sup>14</sup> Similar findings were detected in a study done by Rawal et al. at Shree Birendra Hospital.<sup>15</sup> Considering the similar incidence and prevalence of diseases in India and Nepal due to its racial and geographical similarities and lack of strong data from Nepal, this data can be extrapolated to our country for the general population.

The findings of this study validates that colorectal polyps are common in Nepal as revealed by other studies

as well.<sup>14,15</sup> This data when reviewed together with the increasing incidence of colorectal cancer in Nepal even in younger patients highlights the need for screening colonoscopy in the general population in Nepal - a practice yet to become standard of care in a resource limited country like Nepal.<sup>10,15</sup>

These observations in our study will also have an impact on selecting the age cut-off for the appropriate screening colonoscopy for colorectal cancer in Nepal which has not been assessed previously. Yearly fecal occult blood testing, flexible sigmoidoscopy and colonoscopy done as a screening have each stood with time in preventing long-term colorectal cancer mortality in the western world.<sup>16-18</sup>

One of the limitations of this study is that it is technically not a screening study of the general population as we have performed colonoscopy in a symptomatic patient who have come to a hospital for evaluation. Nevertheless, the results we obtained can be considered a representative of the general population. Besides, a stringent screening study among asymptomatic persons cannot be carried out in a resource limited country like Nepal easily. Although we had excluded colorectal cancer, Inflammatory Bowel Disease and polyposis syndromes from our study, finding blood in stool (one of our indications for performing a colonoscopy) in some patients could still have resulted from a large polyp, leading to some selection bias. However, bleeding is not a common symptom with colonic polyps. Furthermore, with the advent of newer technology like digital Image Enhanced Endoscopy (IEE), it could have been added to our study. Considering this technique's ability to differentiate hyperplastic, adenomatous and invasive cancer, it would have been a great benefit in our study. Thus, we have been studying the correlation between digital IEE and histology of a polyp which we will try to publish in near future. The other limitation of our study is the performance of colonoscopy without sedation resulting in significant patient discomfort which could potentially impair the endoscopist's ability to evaluate the entire colon in sufficient detail. For example, the patient's discomfort might hasten the endoscopist to speed up the withdrawal and insufflate lesser amount of air, leading to lower polyp and adenoma detection rate. However, most colonoscopies are performed without sedation in Nepal.<sup>11,19</sup> However, to our best and sincere effort, strict adherence to the standards of colonoscopic examinations including standardized bowel preparation and self-monitoring of cecum to rectum withdrawal time, a parameter that enhances polyp detection rates and helps prevent missing of colonic lesion.<sup>19</sup> Our cecum-

to-rectum withdrawal time was estimated with the aid of the time display in the monitor. The average time taken for the withdrawal of the scope from cecum- to-rectum was 6 minutes per case which was in accordance with ASGE's published standard.<sup>20</sup> Thus, we believe that our data have a significant amount of reliability.

## CONCLUSIONS

The prevalence of polyp as given by polyp detection rate (PDR) in our study was 12.95%, whereas the prevalence of adenoma as indicated by the adenoma detection rate (ADR) was 5.84%. The risk of occurrence of colorectal polyp and adenoma increased significantly after 40 years of age which was significant statistically ( $p$  value<0.05). One out of eight people over 40 years of age had a polyp. Thus, we recommend each healthy people over 40 years of age in Nepal should undergo screening colonoscopy for the detection of adenomatous polyp.

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**Competing interests:** None declared

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