

# Correlation of Age and Colonic Polyp Size with Malignant Potentiality

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## Abstract:

**Background:** Incidence of detection of colorectal polyp is increasing in recent years. But factors associated with malignant potentiality of colorectal polyp is largely unknown.

**Aims of the study:** The aim of this study was to correlate patient age and colonic polyp size with malignant potentiality.

**Materials and methods:** This was an observational cross sectional study, carried out in Gastroenterology department of Combined Military Hospital (CMH) Dhaka cantonment in between January to December 2019. Total 240 patients were included in the study, whose underwent colonoscopy, had colonic polyps and polyp biopsy was done. Data was collected and analyzed by using SPSS 20 and obtained in tables and diagrams.

**Results:** Out of 240 patients male 165(68.7%), female 75(31.3%) with male to female ratio 2.5:1; mean age±SD 53.3±15.4 years; below 40 years 43 (17.9%), 40-60 years 102 (42.5%) and above 60 years 95(39.6%); 92 (38.3%) patients had different co-morbidity including 39 (16.3%) had multiple co-morbidity; colonic polyps found in caecum 32(13.3%), ascending colon 14 (5.8%), transverse colon

8(3.3%), descending colon 20(8.3%), sigmoid colon 32(13.3%), rectum 104 (43.3%), and multiple sites 30(12.5%); 180(75.0%) polyps were sessile and 60(25.0%) pedunculated with minimum size 3mm and maximum 21mm in diameter; polyps were of neoplastic 91(37.9%), hyperplastic 18 (7.5%), and inflammatory 131(54.6%); among neoplastic polyps 83(34.6%) benign and 8(3.3%) malignant; among neoplastic polyps mild dysplasia 66(72.5%), moderate dysplasia 17(18.7%) and severe dysplasia 8(8.8%); polyps larger than 10mm size were associated with increasing degree of dysplasia, odds ratio (OR) 9.2; 95% CI (2.9 to 29.1), p value <.001; patients of more than 60 years of age were also more associated with increasing degree of polyp dysplasia, odds ratio 3.5; 95% CI (1.3 to 9.2), p value .01.

**Conclusion:** Increasing age of patients and increasing size of colorectal polyps were associated with increasing degree of dysplasia in colonic polyp histopathology.

**Key Words:** Colonic polyp, polypectomy, histopathology, adenoma, dysplasia, carcinoma.

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## Introduction:

Colonic polyps are slow-growing overgrowths of colonic mucosa. They are highly prevalent in the general population especially with increasing age<sup>1</sup>. Though exact etiology of colonic polyps is not known, some risk

factors are associated with it namely are environmental factors, dietary habits and genetic factors such as familial adenomatous polyposis (FAP), hereditary non-polyposis colorectal cancer/Lynch syndrome, Cowden disease and MUTYH polyposis etc. Untreated colonic

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polyps can develop into colorectal cancer<sup>2</sup>. In recent years, the incidence of colorectal cancer has been increased. Most recent studies support adenomatous colonic polyps being considered precursors to the development of colorectal cancer<sup>3</sup>. Colorectal polyps are classified histologically as neoplastic or non-neoplastic (Table 1).

**Table-I**

<i>Classification of Colorectal Polyps<sup>4</sup>.</i>		
Histological classification	Polyps type	Malignant potential
Non-neoplastic	Hyperplastic polyps	No
	Hamartomas	
	Lymphoid aggregates	
	Inflammatory polyps	
Neoplastic (adenomas)	Tubular adenomas (0-25% villous tissue)	Yes
	Tubulo-villous adenomas (25-75% villous tissue)	
	Villous adenoma (75-100% villous tissue)	

All adenomatous polyps have variable degrees of dysplasia ranging from low-grade to high grade. Classically, it is believed that the malignant potential of colorectal adenomas correlates with type of polyp, size, and degree of dysplasia. Higher grades of dysplasia, increasing percentage of villous tissue within the polyp, and polyps greater than 1 cm in diameter are associated with increased risk of malignancy. Colorectal polyp greater than 2 cm size is associated with 50% risk of colon cancer, though invasive cancer is found even in polyp that was less than 1 cm size<sup>5</sup>. A polyp is considered malignant when cancer cells within the neoplasm have extended to the submucosa via penetration through the muscularis mucosal layer.

Any lesion in colon, adenomatous polyps- flat or depressed may be associated with colon cancer. Therefore, early recognition of these lesions and colonoscopic or sigmoidoscopic polypectomy is mandatory, but its safety is also a matter of concern. Polypectomy is not free of risk of complications like colonic perforation or bleeding.

Premalignant polyps, such as adenoma, should be resected endoscopically to prevent their development to colorectal cancer<sup>6</sup>. However, diminutive (d<sup>5</sup> mm) hyperplastic polyps can be left *in situ* without resection because they have no malignant potential, which is called a diagnose-and-leave strategy<sup>7</sup>. When adenomatous

polyps are removed, a repeat colonoscopy is usually performed three to five years later.

Though factors associated with malignant potentiality of colorectal polyp is studied in different countries in the world in recent years, data regarding that issue is very limited in our country. This study may help in gastroenterology practice and future management strategy of colorectal polyps in our country.

#### **Materials and Methods:**

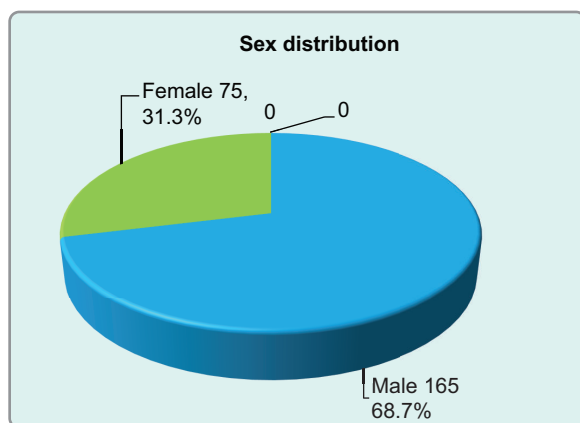
The aim of this study was to correlate resected colonic polyps size and patients' age with their histological grading of dysplasia. This study was an observational cross-sectional study, carried out in Gastroenterology department of Combined Military Hospital (CMH) Dhaka cantonment in between January to December 2019. Total 240 patients were included in the study whose were advised and underwent colonoscopy, had colonic polyps and polyp biopsy was done. Ten years and older patients were included in the study. Patients who had pseudo polyps and patients having unavailable histopathology report were excluded from the study. Verbal consent was taken and data was collected as per questionnaire and analyzed by using SPSS 20 and formulated in tables and diagrams. As there was no intervention or invasive procedure involvement after colonoscopy ethical clearance was not taken.

#### **Results:**

**Table-I**

<i>Demographic characteristics of study patients (n=240)</i>		
Traits	Number	Percentage
Age		
Mean±SD	53.3±15.4	-
Minimum (years)	14	-
Maximum (years)	89	-
<40 years	43	17.9
40-60 years	102	42.5
>60 years	95	39.6
Residence		
Urban	148	61.7
Rural	92	38.3
Occupation		
ServiceHouse wife	8455	35.022.9
Retired from svc	80	33.3
Cultivation	14	5.8
Student	7	2.9
Personal habit		
Smoking	52	21.7
Alcohol	5	2.1

This table shows demographic profile of study patients; among 240 patients mean age±SD 53.3±15.4 years with minimum 14 and maximum 89 years; below 40 years aged 43 (17.9%), 40-60 years 102 (42.5%) and above 60 years 95(39.6%); 148 (61.7%) patients urban and 92 (38.3%) from rural area; 84 (35.0%) were service person, 55 (22.9%) house wives, 80(33.3%) retired from service, 14(5.8%) cultivator and 7(2.9%) students; 52 (21.7%) patients were smoker and 5(2.1%) alcoholic.



**Figure 1:** Sex distribution of study patients (n=240)

Pie chart shows sex distribution of study patients; out of 240 patients male 165(68.7%), female 75(31.3%) with male to female ratio 2.5:1.

**Table-II**

<i>Co-morbidity of study patients (n=240)</i>		
Traits	Number	Percentage (%)
Absent	148	61.7
Present	92	38.3
HTN	18	7.5
DM	21	8.7
Br asthma	14	5.8
Multiple	39	16.3
Total	240	100

Among 240 study patients 92 (38.3%) patients had co-morbidity, of whom hypertension 18(7.5%), DM 21(8.7%), bronchial asthma 14 (5.8%) and 39 (16.3%) had multiple co-morbidity; 148 (61.7%) patients had no co-morbidity.

**Table-III**

<i>Colonic polyps sites in study patients (N=240)</i>		
Traits	Number	Percentage
Polyp sites:		
Caecum	32	13.3
Ascending colon	14	5.8
Transverse colon	8	3.3
Descending colon	20	8.3
Sigmoid colon	32	13.3
Rectum	104	43.3
Multiple sites	30	12.5

Out of 240 patients having colonic polyps, caecal polyps were 32 (13.3), ascending colon 14(5.8%), transverse colon 8(3.3%), descending colon 20(8.3%), sigmoid colon 32(13.3%), rectum 104(43.3%), and multiple sites 30(12.5%).

**Table-IV**

<i>Size and types of colonic polyps in study patients (n=240)</i>		
Traits	Number	Percentage
Size of polyps (mm)		
Mean (mm)	6.6	
Minimum	3.0	
Maximum	21.0	
<6mm	170	70.8
6-9mm	50	20.8
10-20mm	13	5.4
>20mm	7	2.9
Types of polyps		
Pedunculated	60	25.0
Sessile	180	75.0

Table shows size and types of colonic polyps in study patients; <6mm size 170(70.8%), 6-9mm size 50(20.8%), 10-20mm size 13(5.4%), and >20mm size 7(2.9%) with mean 6.6mm, minimum 3mm and maximum 21 mm; 60 (25.0%) polyps were pedunculated and 180 (75.0%) were sessile.

**Table-V***Histopathological types of colonic polyps (n=240)*

Polyp types	Number	Percentage
Neoplastic	91	37.9
Benign-	83	34.6
Tubular adenoma	65	27.1
Tubulovillous adenoma	12	5.0
Villous adenoma	6	2.5
Malignant-	8	3.3
Adenocarcinoma	7	2.5
Malignant melanoma	1	0.4
Hyperplastic	18	7.5
Inflammatory (Non-specific colitis)	131	54.6
<b>Total</b>	<b>240</b>	<b>100</b>

Among 240 patients of colonic polyps neoplastic 91(37.9%) of whose 83(34.6%) benign and 8(3.3%) malignant; among benign polyps tubular adenoma 65(27.1%), tubulovillous adenoma 12(5.0%) and villous adenoma 6(2.5%); among non-neoplastic polyps hyperplastic 18 (7.5%), and inflammatory polyps were

in 131(54.6%) patients; out of 8(3.3%) malignant polyps adenocarcinoma 7(2.5%), malignant melanoma 1(0.4%).

Among 91 neoplastic polyps 66(72.5%) had mild dysplasia 17(18.7%) moderate dysplasia and 8(8.8%) severe dysplasia; 38(41.6%) were <6mm size, 34(37.4%) 6-9mm size, 11(12.1%) 10-20mm size and 7(8.8%) were >20mm sized polyps.

Out of 91 histopathology reports of neoplastic colonic polyps, 66(72.5%) had mild dysplasia of whom 60(65.9%) were <10mm size and 6(6.6%) >10mm size; 25(27.5%) polyps had advanced (moderate/severe) dysplasia, of whom 13(14.3%) were of <10mm size and 12(13.2%) had advanced dysplasia; polyps larger than 10mm size were associated with increasing degree of polyp dysplasia; odds ratio (OR)9.2, 95% CI (2.9 to 29.1), *p value* < .001.

Out of 91 patients of neoplastic colonic polyps, 66(72.5%) had mild dysplasia of whom 41(45.1%) were <60 years aged and 25(27.5%) >60 years aged; 25(27.5%) patients had advanced (moderate/severe) polyp dysplasia, of whom 8(8.8%) were of <60 year aged and 17(18.7%) were >60 years aged; patients of more than 60 years of age were associated with increasing degree of polyp dysplasia; odds ratio (OR)3.5, 95% CI(1.3 to 9.2), *p value* .01.

**Table-VI***Neoplastic polyps size and degree of dysplasia (n=91)*

Traits	Number				Total	Percentage (%)
	<6mm	6-9mm	10-20mm	>20mm		
Mild	35	27	3	1	66	72.5
Moderate	3	6	5	3	17	18.7
Severe	0	1	3	4	8	8.8
<b>Total</b>	<b>38</b>	<b>34</b>	<b>11</b>	<b>8</b>	<b>91</b>	<b>100</b>

**Table-VII***Degree of dysplasia of neoplastic polyps in relation to size (n=91)*

Dysplasia	Total	>10mm size polyps	<10mm size polyps	$\chi^2$ value	Df	<i>p value</i>
Mild	66(72.5)	60(65.9)	6(6.6)	17.299	1	<.001
Moderate/ Severe	25(27.5)	13(14.3)	12(13.2)			

(Chi square test was done to measure the level of significance. Df=Degrees of freedom)

**Table-VIII***Degree of dysplasia of neoplastic polyps in relation to patients age (n=91)*

Dysplasia	Total	<60 yrs age	>60 yrs age	$\chi^2$ value	Df	<i>p</i> value
Mild	66(72.5)	41(45.1)	25(27.5)	6.619	1	.01
Moderate/ Severe	25(27.5)	8(8.8)	17(18.7)			

*(Chi square test was done to measure the level of significance. Df=Degrees of freedom)***Discussion:**

Colorectal polyps are commonly encountered in gastroenterology clinical practice. Male appears to have a moderately higher colonic polyp incidence than females, with earlier onset observed in some studies<sup>8</sup>. In our study, we also found higher number of male 165(68.7%) patients having colonic polyps than female 65(31.3%) with male to female ratio 2.5:1. Colorectal polyps are more common in elderly. In previous study<sup>9</sup> from Bangladesh also found higher number of colonic polyps in male 33(66%) than female 17(34%) with male to female ratio 1.9:1 and more affecting in increasing age, 6<sup>th</sup> decades through 4<sup>th</sup> decades 28% and 24% respectively.

According to the adenoma-carcinoma theory, adenomatous polyps are the precursors of most colorectal cancers<sup>10</sup>. In the national polyp study, of 5066 polyps removed in 2362 patients, 66.5% were adenomatous, 11.2% were hyperplastic, and 22.3% were other types (normal colonic mucosa, inflammatory or juvenile polyps, or other less common entities)<sup>11</sup>. Evidence also indicates that larger adenomas and adenomas with villous histology put patients at greater risk of developing cancer. We observed neoplastic adenomas 91(37.9%), hyperplastic polyps 18 (7.5%), and inflammatory polyps 131 (55.0%). There were malignant polyps 8 (3.3%) also. Tubular adenomas 65(27.1%) were more common among adenomatous polyps.

Every colorectal adenoma has a 5% probability for malignant transformation<sup>12</sup>. Colorectal cancer generally develops slowly over time from benign precursor lesions, and that the majority of benign polyps do not progress to cancer<sup>13-14</sup>. The prevalence, histology, and immediate cancer risk of colorectal polyps according to linear size

within asymptomatic screening cohorts is established in recent decades<sup>15-16</sup>. Of these, polyp size is likely the single most important consideration, as it directly correlates with important histologic features such as high-grade dysplasia (HGD) and invasive cancer<sup>17</sup>. The percentage of transformation of small (6-9 mm) adenoma into carcinoma is 0.25%<sup>18</sup>.

Malignant potential of colonic polyp is associated with degree of dysplasia, types of polyps, and size<sup>19</sup>. Colorectal cancer is known to occur more frequently in larger polyps. In a previous study<sup>14</sup> cancer was present in about 1% of adenomas smaller than 10mm, 10% of 10–20mm adenomas, and nearly 50% of adenomas larger than 20mm. Our study found most of the colonic polyps were of within 10mm (220; 91.7%) in size, remaining 20(8.3%) were of more than 10mm size, 7 out of 8(3.3%) malignant polyps were in this group.

The serrated neoplastic pathway accounts for up to 30% of all sporadic colorectal cancers. Sessile serrated adenomas or polyps with cytological dysplasia are high risk serrated colorectal cancer precursor. In a multicentre prospective study<sup>20</sup> on 268 sessile adenomas (of 207 patients) found 32.4% cytological dysplasia in polyps of  $\geq$ 20mm in size and cancer occurred in 3.9% cases. On multivariable analysis, they also found that polyp dysplasia was associated with increasing age, odds ratio 1.69 per decade; 95% CI (1.19 to 2.4), *p* value .004. In our study we observed most of the study polyps were sessile (180; 75.0%) and cytological dysplasia was in 91(37.9%) colonic polyps, being 8(3.3%) had cancer. We also found 25(27.5%) polyps had advanced (moderate to severe) dysplasia, of whom 13(14.3%) were of <10mm size and 12 (13.2%) had advanced dysplasia; polyps larger than 10mm size were associated with increasing degree of polyp dysplasia; odds ratio (OR)

9.2, 95% CI (2.9 to 29.1), *p* value < .001. Multivariable analysis of the previous study<sup>20</sup> also observed that polyp dysplasia was associated with increasing lesion size, odds ratio 1.90 per 10mm; 95% CI (1.30 to 2.78), *p* value .001. We found 95(39.6%) study patients had colonic polyps who were over 60 years of age. We also observed 25(27.5%) patients had advanced (moderate to severe) polyp dysplasia, of whom 8(8.8%) were of <60 year aged and 17(18.7%) were >60 years aged; patients of more than 60 years of age were associated with increasing degree of polyp dysplasia; odds ratio (OR) 3.5, 95% CI (1.3 to 9.2), *p* value .01.

#### Limitations of the study:

This was a single center study with small sample size. Duration of study was also relatively shorter.

#### Conclusion:

Increasing age of patients and increasing size of colorectal polyps was associated with increasing degree of dysplasia in histopathology. However, further large-scale study is needed to formulate actual picture of Bangladesh that may help in future planning in gastroenterology practice in our country.

#### Conflict of Interest

There is no conflict of interest regarding the research, authorship and publication of this article.

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