

## Colonoscopic Experience in the Department of Paediatric Gastroenterology, BSMMU

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### Abstract:

**Background:** Colonoscopies are now widely and routinely performed as a diagnostic and a therapeutic tool worldwide. Although the safety and effectiveness of colonoscopies in adults has been well established in the past two decades, however, its utility for pediatric patients is only recently emerging. Lower GI bleeding, unrelieved abdominal pain and unexplained diarrhea are the common indications of colonoscopy.

**Objective:** The aim of this study was to assess the clinical manifestations and colonoscopic findings of children who underwent the procedure during study period.

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**Patients and methods:** *This cross-sectional study was conducted on 217 children who underwent colonoscopy in the Department of Paediatric Gastroenterology, BSMMU from 1<sup>st</sup> January, 2015 to 31<sup>st</sup> January, 2017. Among them 62% were male and 38% were female with ages ranging from 8 months to 16 years.*

**Results;** *Hematochezia (43%) and abdominal pain (25%) were the most common presentations preceding colonoscopy. No serious complications occurred during the procedures. A total of 137 patients (65%) received a positive diagnosis, including 94 (43%) patients with colorectal polyps and 47 (22%) with erythema and ulcerations. Rectum (68%) was the most common site of all colorectal polyp. Among the pathological findings Juvenile polyps (62%) were the most common findings followed by non specific colitis (26.7%), inflammatory bowel disease (8%).*

**Conclusion:** *Colonoscopy in pediatric patients is a safe and effective procedure. Hematochezia is the commonest indication for colonoscopy in Paediatric Gastroenterology Department and polyps are the common finding during colonoscopy.*

**Key words:** Colonoscopy, hematochezia, polyp.

## INTRODUCTION

Pediatric colonoscopy is a useful diagnostic and therapeutic for tool for lower GI pathology. Since its introduction in the late 1970s, the colonoscopy field has developed rapidly, especially in the 21<sup>st</sup> century.<sup>2,3</sup> Though the safety and effectiveness of diagnostic or therapeutic colonoscopies in adults has been well established in the past two decades<sup>2</sup> but its utility for pediatric patients is only recently emerging. Although indications of pediatric colonoscopy are similar to adults colonoscopy like hematochezia, unrelieved abdominal pain, and unexplained diarrhea<sup>1,3</sup> but differs significantly from its adult parallels in regards to patient as well as parent management and preparation, selection criteria for sedation and general

anesthetic, bowel preparation, and instrument selection. Colorectal polyps are common during childhood and usually present with painless rectal bleeding and approximately 20–30% of IBD patients are diagnosed in childhood.<sup>5</sup> Early detection of both polyps and IBD can significantly improve the patients' quality of life and overall health. Therefore, in pediatric patients, colonoscopy is the best tool both for early lesion detection and as an effective therapy to treat lesions.<sup>5</sup>

## **MATERIALS AND METHODS**

This study was conducted on 217 patients (135 male and 82 female with age ranging from 1 to 18 years) at the department of Pediatric Gastroenterology and Nutrition, BSMMU, Dhaka, Bangladesh from January 2015 through February 2017.

All patients who needed colonoscopy for different indications (hematochezia, abdominal pain, altered bowel habit) within this period at the department of Pediatric Gastroenterology and Nutrition, BSMMU, Dhaka, Bangladesh were included in this study. Patients who did not give consent for colonoscopy and who had low hemoglobin along with or without thrombocytopenia and coagulopathy were excluded from the study.

## **PROCEDURES OF COLONOSCOPY**

All patients were kept on clear liquids for approximately 12–24 hours prior to the colonoscopy. Polyethylene glycol (PEG) was administered 4g/kg along with Phosphate enema among the patients who were more than 6 years old. Patients younger than 6 year were only put on laxative (PEG). Sedation used was a combination of midazolam and pethidine in all cases. Pethidine was given at the dose of 1 mg/kg body weight intramuscular route and midazolam 0.2-0.4 mg/kg

intravenously. No side-effects were observed during the procedure. Colonoscope used was Pentax EC 3490 LK 3.8 pediatric colonoscope. No significant adverse events occurred during the procedure.

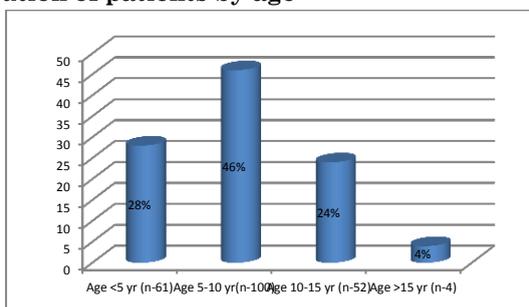
Statistical analyses were performed using the SPSS software (version 16.0; SPSS, Inc., Chicago, IL). The results are reported with the median age or the percent frequency for the categorical data. Continuous variables were tabulated using the Categorical variables were analyzed with a chi-squared test. All hypotheses were twotailed and statistical significance was determined by a P value less than 0.05.

## **RESULTS:**

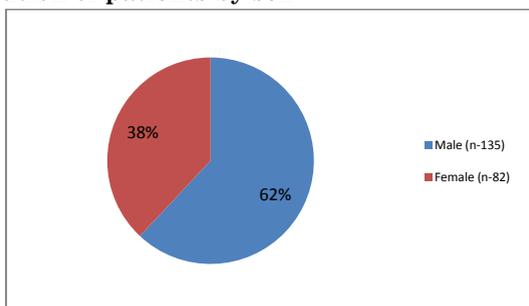
Among the 217 studied subjects 62% (n=135) were male and 38% (n=82) were female. Commonest age group was 5-10 years (46%) followed by children below 5 year of age (28%) (Fig 1& 2). The youngest patient was an eight month old male child. The most commonest complaint that lead to colonoscopy was per rectal bleeding (43%). Besides this other complaints are abdominal pain, fever, altered bowel habit and constipation (Fig 3). After doing colonoscopy polyp was found among 43% of patients. About thirty nine percent (39%) had pedunculated and four percent (4%) had sessile polyp. Polypectomy were done in all pedunculated polyp and tissue were sent for histopathology. Sessile ones were removed by cauterization. Next to polyp findings were mucosal edema, linear ulceration, diffuse non-specific inflammation. Colonoscopically normal patients were 35 % (Fig 4). There is no significant differences in hematological parameter between polyp and colonoscopically normal child, but significant differences in parameter present between polyp and other than polyp patients. (Table 1) Polyp were found more in male child (63 %) than female child (37%). Forty nine percent of polyps are within the range of 5-10 years of age and 91% of

polyps are within 0-10 of age. (Table- 2) Histopathologically all polyps (n=84) were hamartomatous but two, which were adenomatous. Other histological findings were non specific colitis and ulcerative colitis 31% and 4.5% respectively. (Table - 6) Ninety seven percent of polyps were found in recto-sigmoid region and solitary polyp was present among 75% of cases. (Table-3). No significant complications occurred in any patients other than mild abdominal pain and bleeding.

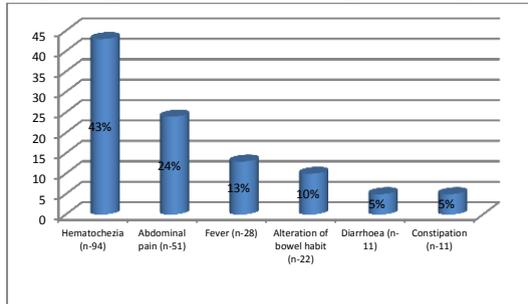
**Fig 1: Distribution of patients by age**



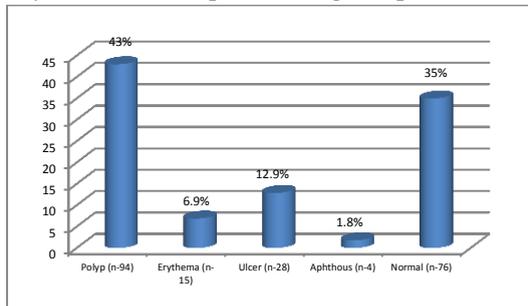
**Fig 2: Distribution of patients by sex**



**Fig 3: Presenting complaints of children preceding colonoscopy**



**Fig 4: Frequency of colonoscopic findings in patients**



**Table 1: Comparison of lab profile of studied subjects**

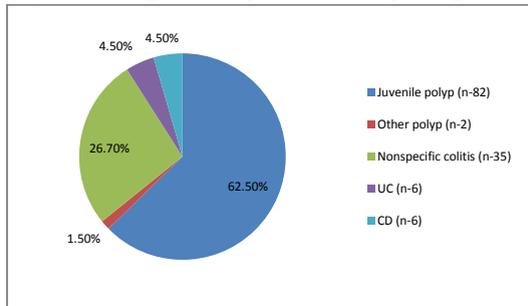
Parameter	Polyp (n=94) Mean± SD	Other than polyp (n=43) Mean± SD	P value	Polyp (n=94) Mean± SD	Normal (n=80) Mean± SD	P value	P value
Hb (gm/dL)	11.4±1.2	10.3± 2.0	0.001*	11.4±1.2	0.394.394	0.394.394	0.003
ESR (mm in 1 <sup>st</sup> hr)	20.4 ±15.3	36.1 ± 30.8	<0.001	20.4 ±15.3	0.255	0.255	<0.001
WBC (mm)	7931.5 ± 3143.5	9714 ± 4564.6	0.009	7931.5 ± 3143.5	0.766	0.766	0.010
Platelet count (X10 <sup>9</sup> /mm)	318.7 ± 74.5	431.4 ± 165.9	<0.001	318.7 ± 74.5	0.090	0.090	<0.001
CRP (mg/dL)	11.4±1.2	11.0 ± 21.8	0.002	11.4±1.2	0.275	0.275	0.008

**Table 2: Distribution of patients by demographic characteristics of polyp**

Demographic characteristics	Frequency of polyps	Percentage
<b>Age</b>		
<5 yrs	40	42.5
5-10 yrs	46	48.9
10-15 yrs	8	8.5
> 15 yrs	0	0
<b>Sex</b>		

Male	59	63
Female	35	37
Male :female	1.6:1	
Total	94	

**Fig 5: Frequency of histopathological findings in patients (n-131)**



**Table 3: Distribution of polyps by location and number (n=94)**

Age (yr)	<5	5-10	10-15	>15	Total (%)
<b>No. of polyp</b>					
1	29	38	4	0	671(75.1)
2	6	7	0	0	613(13.8)
>2	5	2	3	0	610(10.6)
<b>Site of polyp</b>					
Rectum	32	29	7	0	6 68(72.3) (72.3)
Sigmoid colon	8	15	1	0	24(25.5)
Transverse colon	0	2	0	0	2(2.1)
<b>Type of polyp</b>					
Pedunculated					84
Sessile					10

## DISCUSSION:

Bleeding per rectum or lower GI bleeding is always an alarming symptom and creates panic in both parents and the patients. It is one of the common reasons for which children are referred to pediatric gastroenterologists and pediatric surgeons.<sup>2</sup> The causes of LGIB are different in children than adults. Most causes of LGIB are usually benign. Differential diagnosis includes anal fissure, hemorrhoid, colonic polyps, gastrointestinal infection, inflammatory bowel disease, and allergic colitis.<sup>2</sup> Colonoscopy is the procedure of choice for finding polyps or any other mucosal lesions leading to LGIB.<sup>2,3</sup>

In our study, among 217 patients 62% are male and rest 38% are female. Male predominance are also seen in a study done by Lei et al (2014).<sup>5</sup> In their study they found 67% of cases were male. Mean age of the study children was 7.57(standard deviation 3.8 years) which is similar to study done by We JH who found the mean age was 6.4 years (standard deviation 4.4 years).<sup>2</sup>

The commonest indication that lead to colonoscopy in our series was hematochezia (43%), which was also found most common by Park et al (56%) and Khusdil et al (78%) during their study. <sup>1,2</sup>

Juvenile colorectal polyps are the most common tumors of the colon and rectum in children and account for 93% of all polyps of the gastrointestinal tract.<sup>2</sup> In the literature, the prevalence of colorectal polyps varied greatly in pediatric patients who underwent colonoscopy. The prevalence of juvenile colorectal polyps in children undergoing endoscopic examination for various indication is reported high in India (61.7% - 67.7%)<sup>12</sup> compared with western data (4% – 17.5%)<sup>2,3</sup>. It was also found high in Pakistan(75%).<sup>7</sup> In our study, colorectal polyps were the most prevalent finding and were identified in 43% of the patients. The variation in detection rate might be due to the difference in colonoscopy indications within each healthcare system, as well as the patients' age and ethnicity. Juvenile polyp was found 26.4% in a study done in Korea which is albeit lower than our findings.<sup>10</sup> However, in all these studies the most common indication for colonoscopy was LGIB and the most common finding was juvenile polyp. It was also the finding of our study. Like other previous reports we also found polyps more in boys than in girls. <sup>2,3,4</sup>

In our series, mean age at diagnosis of polyp was 5.6 years and 48.9% patient was in between 5-10 years of age. Mandhan also found in his studies it was 5.2 years. There are only 8 (8.5%) children were in between 10-15 years of age in our

study, which parallels the observations made by some other studies<sup>2,3</sup> that juvenile polyps have a natural tendency to disappear and auto amputate in late childhood.

It has been generally accepted that juvenile colorectal polyps are usually solitary<sup>14,17,21</sup> but recent reports suggest that multiple polyps do occur in 20-35% of the pediatric population.<sup>13,15,2</sup> In the present study, we found multiple polyps (maximum five) in 24% (n=23) of children and familial polyposis in a single case. In the literature, majorities of polyps are located in the rectum and sigmoid colon,<sup>2,3,4</sup> that is also consistent with our study. About 97% of polyps are located in recto-sigmoid region. However, polyps located in the proximal colon were not uncommon; moreover, previous studies suggest that the detection of polyps in the proximal colon is increasing.<sup>1,23</sup> We found 2 polyps (2.1%) proximal to sigmoid colon. Therefore the use of pancolonoscopy in the evaluation of GI pathology should be considered more frequently.

About 35% colonoscopy findings in our study was normal, this similar result was shown by Clarke et al reported 30% normal results and We JH found 30.6% normal findings.<sup>6,10</sup> Another study conducted by Motamed in Shiraj revealed prevalence rate of 23% of normal colonoscopy.<sup>2</sup>

Like other studies,<sup>12,13,26</sup> juvenile polyps (87%) are the most prevalent finding in histopathology in our studies. We found adenomatous polyp in only 2% of cases. Colorectal adenomas are known to be precursors of sporadic and hereditary colorectal cancer.<sup>2</sup> previous pediatric studies reported variable prevalence for polyps with adenomatous changes. Gupta et al. found only one adenomatous polyp among 195 colonoscopies performed in a tertiary referral center in the USA.<sup>12,2</sup>

Latt et al also found one adenomatous polyp in their 10-year audit of 730 colonoscopies.<sup>14</sup> On the other hand, Cynamon et al. reported 8% adenomatous polyp in 41 children with

polyps in a referral center in the USA.<sup>13</sup> Furthermore, a report out of India also showed adenomatous changes in 11% (17/152) of children with polyps.<sup>12</sup>

Other histological findings of our study are nonspecific colitis 24.8% and inflammatory bowel disease 9.1%. In Iran a study showed biopsy sample were nonspecific 26.4%, juvenile polyp 23.1% followed by lymphoid nodular hyperplasia 15.2% and solitary rectal ulcer 8.9%.<sup>2</sup> In our study the second most common finding was nonspecific colitis. Khudil et al found it was about 16% and We JH found 5.7% in their study.

We found 6 cases (4.5%) of ulcerative colitis in this study. In all cases ulceration started from rectum and pancolitis was present in a single case. Extension of lesion upto transverse colon was found in two cases. Rest three cases had lesion up to sigmoid colon. A Korean study revealed that, a typical distribution of inflammation was seen in 20% of newly diagnosed ulcerative colitis (UC) patients during initial colposcopy, 3.3% had segmental UC with rectal sparing and 15.8% presented with segmental skip.<sup>2</sup> In our study there was no rectal sparing.

Among 6 cases of CD, aphthous ulcer was present in 4 cases along with longitudinal ulcer. Cobble stoning was present in 2 cases. Non caseating granuloma, the biopsy feature suggestive of crohn's disease was not present in any of the case. The reason may be the more submucosal presence of granuloma. CD was diagnosed on the basis of clinico-biochemical features as well as morphological features in colonoscopy. In crohn's a Korean study reported longitudinal ulcer in 37.2% , cobblestone in 23.9% and aphthous ulcers in 59.3% of newly diagnosed CD cases. Non-caseating granuloma , a biopsy feature suggestive of CD in only 13%-36% of patients with crohn's disease.<sup>2</sup>

## CONCLUSION

Most patients with recurrent painless rectal bleeding warrant endoscopic examination of the lower gastrointestinal tract. For children presenting with painless rectal bleeding a diagnosis can be established in the majority if total colonoscopy is performed.<sup>5</sup> Our study found that colonoscopy in pediatric patients was safe and effective, both as a diagnostic and therapeutic procedure. Hematochezia and abdominal pain/discomfort were the most common presentations and polyps were the most common finding during colonoscopy.

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