

Colonoscopy in children

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Abstract

Background: Pediatric colonoscopy is routinely performed in most hospitals in Saudi Arabia and yet published data are scarce. The objective of this report is to describe our experience in the practice of pediatric colonoscopy in Saudi Arabia.

Patients and Methods: Retrospective analysis of data of all patients below 18 years of age who underwent colonoscopy over a 10-year period.

Results: From 1414 H (1993 G) to 1423 H (2002 G), two hundred and seventeen colonoscopies, of which 183 diagnostic procedures, were performed on 183 children. The majority (94%) were Saudi nationals, the age range was between 5 months and 18 years, and the female to male ratio was 1: 0.8. Colonoscopy was total in 58 (32%) and limited in 125 patients (68%). The commonest reason for not completing the procedure was securing the diagnosis in 45/125 patients (36%). The commonest indication was rectal bleeding (35%). The highest yield was in children with bloody diarrhea (91%) and the lowest in those with abdominal pain (27%) with an overall yield of 44%. Colitis was the most common diagnosis occurring in 66% of the children.

Conclusion: this report highlights the role of colonoscopy in the recognition of diseases of the colon in our community and identifies some of the problems areas associated with the performance of this procedure in our institution.

Keywords: colonoscopy, diseases of the colon, children.

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The introduction of fiberoptic colonoscopy in pediatric practice several decades ago has improved the detection and the management of gastrointestinal diseases worldwide^{[1],[2]}. All reports have shown that this procedure is safe and useful diagnostic tool in children of all age groups^{[1],[2],[3],[4]}. In Saudi Arabia, although pediatric colonoscopy is performed routinely in all tertiary care hospitals, a literature search revealed only one report from our institution in 1999^[5]. The objective of this study is to report our experience with this procedure in the investigation of children presenting with various complaints suggesting colonic disease. It is hoped that such report will stimulate similar studies from other regions of the country and contribute to better definition of the pattern of colonic diseases in our community.

Patients and Methods

This is a retrospective analysis of all consecutive colonoscopies performed on children 0-18 years of age at King Khaled University Hospital (KKUH) over a period of ten years. The children are referred for colonoscopy after evaluation by gastroenterologists. The procedure is performed by or under the supervision of consultant gastroenterologist. In our hospital, a standard bowel preparation is most commonly used^[1] with variations in the type and doses of purgatives according to the preference of the endoscopist. The procedure is performed under sedation in most cases. The type of sedation is left to the endoscopist, but most commonly a combination of midazolam and pethidine is used; whereas general anesthesia is reserved for those who fail the sedation with maximum doses or those who might require a therapeutic procedure. Data retrieved from the records included age, gender, and nationality. The indication, extent, tolerance, adequacy of bowel preparation, and colonoscopic diagnosis were recorded. Simple descriptive statistics were performed to define the abovementioned variables. Data were analyzed for two age groups; from 0-12 years and 13-18 years to identify any age related variation.

Results

From 1993 to 2002, 217 colonoscopies were performed on children. There were 34 either repeat, follow-up, or therapeutic procedures and therefore excluded from analysis. The remaining 183 diagnostic colonoscopies were performed on 183 consecutive patients who will be the subjects of this analysis. Most of the children (94%) were Saudi nationals, the age range between 5 months to 18 years, and the female to male ratio was 1: 0.8. The extent of the procedure is shown in [\[Table - 1\]](#), indicating that only 58 procedures (32%) were completed to the cecum. [\[Table - 2\]](#) depicts the reasons for not completing the procedure to the cecum, indicating that the commonest reason was securing the diagnosis in 45 patients (36%), followed by intolerance and poor preparation of the colon in 27 patients (22%) each. The indications and yield of colonoscopy are presented in [\[Table - 3\]](#), which shows that the commonest indications were in patients presenting with rectal bleeding and

abdominal pain accounting for 35% and 27% of the indications respectively. The overall diagnostic yield was 44%, the best yield being in children presenting with chronic bloody diarrhea (91%) and the lowest in those with abdominal pain (27%). Finally, the pattern of colonoscopic diagnosis is presented in [Table - 4], indicating that colitis was the commonest finding (66%), followed by polyps in 16 patients (20%). There were 13 patients with juvenile polyps, of which eight were in the rectum, three in the sigmoid and 2 in the descending colon. The remaining 3 patients had multiple adenomatous polyposis all over the colon.

Discussion

Compared to a previous report from the same institution, it appears that the demand for pediatric colonoscopy has increased from 66 over 15 years^[5], to 217 over ten years in this report. The main reasons for this are probably the availability of pediatric gastroenterology services and possibly a change in the disease pattern. A slight trend of more females than males (ratio of 1: 0.8) was identified contrasting with some reports^{[5],[6]} but consistent with the same trend observed in our patients who underwent upper endoscopy^[7]. The finding that total colonoscopy was possible in only 32% of the patients is much lower than the experience of others^{[4],[5],[6]}. However when the reasons for not completing the procedure are analyzed, it is possible that the endoscopist performing an initial procedure, satisfied by finding the diagnosis decided not to complete the procedure saving the patient from further discomfort or complication. Although such approach may be justified in some cases such as those with acute colitis with easy bleeding, uncooperative patients who badly tolerate the procedure or poorly prepared colon interfering with proper assessment of the mucosa, pancolonoscopy remains the procedure of choice^{[3],[8],[9]}. In addition, despite using maximum doses of standard premedication (most commonly pethidine and midazolam), the number of uncooperative, poorly tolerant patients 27 (22%) interfering with completing the procedure to the cecum was higher than in other reports. We have noticed paradoxical effects, of this regimen or midazolam alone, consisting of unconscious agitation or aggressiveness in some children similar to those reported with diazepam^[10]. Interestingly, all of the intolerant patients but one are in the adolescent age group. Good colon preparation is essential for proper colonoscopy. Unfortunately, no regimen is known to suit all patients and adjustment is frequently necessary. Despite using standard colonic preparations, the rate of poorly prepared colon (22%) is higher than reported by others^[5]. The explanation of sub-optimal colon preparation is not clear to us. Possible causes could be variation in diet, colonic function, or simply lack of recognition of patients (by physicians or families) with marginal constipation that may require more vigorous colon preparation. It is clear that better colon preparation and tolerance are needed in order to improve the results. Finally, this report indicates that technical difficulty is a very rare obstacle (4%) to performing pancolonoscopy. The indications for colonoscopy in this study were

similar to those reported from other countries [\[1\],\[4\],\[6\]](#) . The low overall yield of 44% may be a consequence of the high rate of limited procedures and flexibility in the selection of patients. The low yield of colonoscopy in patients with abdominal pain (the second commonest indication) is consistent with the experience of others and indicates the need for better selection criteria of those patients before they are subjected to colonoscopy. The pattern of colonoscopic diagnoses revealed a high percentage of colitis (66%), confirming the finding of others. Since the first report of ulcerative colitis in Saudi children [\[11\]](#) , there has been a steady increase in the diagnosis of colitis in children [\[5\],\[6\]](#) . This trend, also observed in adults, probably reflects a combination of increased incidence possibly related to changes in lifestyle, improved index of suspicion, and availability of pediatric gastroenterology services. It is interesting to note two special cases, one is a five-year old boy with a behavioral disorder and a history of pica including frequently eating pieces of glass. He complained of recurrent bleeding per rectum. Pancolonoscopy under general anesthesia was normal, except for sharply demarcated linear mucosal ulcerations interpreted as posttraumatic injuries. The other case was a 5-month old with persistent bloody diarrhea and pancolonoscopy without sedation showed a violaceous mass obstructing the ascending colon, which disappeared upon air insufflation. The diagnosis was intussusception reduced by air insufflation. The pattern of the remaining conditions is similar to that in most other reports [\[4\],\[5\],\[6\]](#)

In conclusion, The introduction of pediatric colonoscopy has contributed to the recognition of diseases of the colon in our institution. In addition, this report highlights some of the problems areas associated with the performance of this procedure in our community. Variations in the tolerance of the procedure and effectiveness of colon preparation regimens may be culture dependent.

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Table 1: Extent of colonoscopy in 183 patients

Age groups (years)	Total colonoscopies	Limited colonoscopies	Total number (%)
0 - 12	20	38	58 (37%)
13 - 18	38	87	125 (63%)
0 - 18	58	125	183 (100%)

Table 2: Reasons for limited colonoscopy in 125 patients

	0-12 years	13-18 years	0-18 years
	Number	Number	Number (%)
Diagnosis secured	15	30	45 (36%)
Intolerance	1	26	27 (22%)
Poor preparation	3	24	27 (22%)
Technical difficulty	3	2	5 (4%)
Excessive bleeding	2	0	2 (1%)
Unknown	6	13	19 (19%)
Total	30	95	125 (100%)

Table 3: Indications and yield of colonoscopy in 183 children

	Indications	Diagnostic yield
	Number (%)	Abnormal / total (%)
Chronic diarrhea	21 (11%)	9/21 (43%)
Bloody diarrhea	23 (13%)	21/ 23 (91%)
Rectal bleeding	64 (35%)	34 / 64 (53%)
Abdominal pain	49 (27%)	13 / 49 (27%)
Others*	26 (14%)	3 / 26 (12%)
Total	183 (100%)	80 / 183 (44%)

*Include: rectal biopsy 8, perianal disease 6, anemia 3, constipation 4, and abdominal distention 2. Esophageal ulcerations, polyarteritis, and foreign body 1 each.

Table 4: Pattern of colonoscopic diagnosis in 80 children

	Age in years		
	0 - 12	13 - 18	0 - 18
	Number of cases	Number of cases	Total number (%)
Colitis	13	40	53 (66%)
Polyps	7	9	16 (20%)
Rectal ulcers	1	3	4 (5%)
Internal hemorrhoids	1	3	4 (5%)
Others*	2	1	3 (4%)
Total	24	56	80 (100%)

*Post-traumatic injury, intussusception, telangiectasia.