Yield of colonoscopy in children with rectal bleeding

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ABSTRACT

Objective: Rectal bleeding is a common complaint in children and is the most common indication for colonoscopy. The aim of this study is to report the yield of this procedure in children.

Methods: Analysis of the medical records of all children below 18 years of age, who underwent colonoscopy from 1993 to 2002, in King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia for the evaluation of rectal bleeding.

Results: Eighty-nine children presented with bleeding per rectum, accounting for 49% of the indications for colonoscopy. The majority (92%) was Saudi nationals, the age range was from 5 months to 18 years, and the male to female ratio was 1.1: 0.9. There were 22 children between 0-12 years and 35 between 13-18 years. The overall yield of colonoscopy was 57/89 (64%); however, the yield was slightly better 22/32 (69%) for children 0-12 years. In a subset of children (22 patients, 21 of them were in the age group 0-12 years) where rectal bleeding was associated with diarrhea, the yield was 22/23 (97%). The causes of bleeding per rectum are presented in the table indicating that colitis was the most common cause 30/57 (36%), followed by polyps in 15 (27%); whereas rectal ulcers, chronic anal fissures and hemorrhoids accounted for 5% each. However, age-related analysis shows that colitis occurred more commonly in older children and polyps were found almost with equal frequency in both age groups.

Conclusion: The diagnostic yield of colonoscopy is very high especially in children presenting with bloody diarrhea.

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Bleeding per rectum (BPR) is one of the most important presenting symptoms in children. It may occur in the form of fresh bright-red or maroon-colored (hematochezia), or black-colored stools (melena). Occult gastrointestinal bleeding is a persistent blood loss that is not associated with changes of stool color or texture but may lead to iron deficiency anemia. Rectal bleeding may occur as part of a known systemic disease such as Henoch Schonlein purpura or intussusception requiring no special investigation other than those needed for the original disease. However, most commonly, BPR is caused by a condition located anywhere from the esophagus to the anus, requiring investigation of the location and cause of the problem. A systematic approach is needed and includes a history to define the age of onset, the severity and the character of the bleeding whether associated with pain, fever, constipation or diarrhea. A meticulous general physical examination to detect feature of systemic diseases, a thorough perianal area and rectal examination in the search of anal fissures or rectal polyps. Finally, general laboratory investigation in the form of complete blood count, platelets, prothrombin time, partial thromboplastin time, erythrocyte sedimentation rate, stool analysis and culture may be needed. The choice of special investigation such as double-contrast barium enema,

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technicium-99 scintigraphy (Meckel scan), angiography, or endoscopy) should be based on the results of history and physical examination.[1,2] The yield of colonoscopy; however, depends on many factors including the prevalent pattern of colonic diseases in a given community. The lack of published data, to our knowledge, prompted us to report our experience on the yield of colonoscopy in Saudi Arab children presenting with rectal bleeding.

Methods. This is a retrospective analysis of the medical records of all children below 18 years of age, who underwent colonoscopy for the evaluation of rectal bleeding over a 10-year period. Colonoscopy was performed either by gastroenterology consultants (pediatric for children up to 12 year of age, and adult thereafter) or by senior fellows with close supervision. The procedure was performed usually under sedation with midazolam and pethidine after standard colon preparation.[3] Information retrieved including the age at presentation, gender, nationality, and results of colonoscopy. Clinical notes of colonoscopy and histopathology reports were verified. The final diagnosis was based on the correlation of clinical features with colonoscopic and histopathologic findings. Data were analyzed using simple descriptive statistics.

Results. Between 1993 and 2002, 183 diagnostic colonoscopies were performed on children in King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia. Eighty-nine children presented with bleeding per rectum, representing 49% of the indications for colonoscopies performed during the same period. The majority (92%) was Saudi nationals, the age range was from 5 months to 18 years, and the male to female ratio was 1.1: 0.9. There were 22 children between 0-12 years and 35 between 13-18 years. The overall yield of colonoscopy was 57/89 (64%); however, the yield was slightly higher 22/32 (69%) for children 0-12 years. In a subset of children (22 patients, 21 of them were in the age group 0-12 years) where rectal bleeding was associated with diarrhea, the yield was 22/23 (97%). The causes of bleeding per rectum are presented in the **Table 1** indicating that colitis was the most common cause with 36% (30/57) followed by polyps in 27% (15); whereas rectal ulcers, chronic anal fissures and hemorrhoids accounted for 5% each. However, age-related analysis shows that colitis occurred more commonly in older children and polyps were found almost with equal frequency in both age groups.

Discussion. In the evaluation of children with suspected rectal bleeding, whether in the form of hematochezia or melena, it is important to make sure that one is actually dealing with blood and that this blood is not coming from outside the gastrointestinal tract (GIT). Many substances such as colored drinks, gelatins, beets, and antibiotics, are known to color stools simulating hematochezia. Similarly, the ingestion of bismuth containing compound, therapeutic iron supplements, charcoal and spinach may simulate melena "false BPR".[4] In addition, swallowed blood by a breast-fed baby from a breast lesion or from a nasopharyngeal lesion is potential causes of melena. Accordingly, colonoscopy, which is an invasive procedure, is indicated when BPR persists despite exclusion of "false BPR", and bleeding of extraintestinal origin. The accuracy of colonoscopy is higher than the most accurate barium study[5] but the yield depends on many factors. The yield is higher in experienced hands who have the ability to use equipment appropriate for age, and to performed a complete inspection of the colon up to the cecum, which should be possible in more than 90% of the procedures,[6] in patients well selected in whom "false BPR" and bleeding of extraintestinal origin have been excluded. Finally, the yield is related to the age distribution and the pattern of gastrointestinal diseases in the community.

Table 1 - Causes of rectal bleeding in 57 children.

Causes	**Age (years)**		**Total**
	0-12	**13-18**	**0-18 n (%)**
N of procedure (%)	22/32 (69)	35/57 (61)	**57/89 (64)**
Colitis	9	21	**30 (53)**
Polyps	7	8	**15 (27)**
Rectal ulcers	1	2	**3 (5)**
Chronic anal fissures	2	1	**3 (5)**
Hemorrhoids	1	2	**3 (5)**
Others*	2	1	**3 (5)**
Total	**22 (39)**	**35 (61)**	**57 (100)**

*Includes one colonic trauma, one telangiectasia and one intussusception

In this study, BPR was the most common indication for colonoscopy (49%), a finding that is similar to other reports.[7] The overall yield of 64% is higher than the 53% yield reported from Singapore.[8] It is interesting to note a significant difference in the 60% yield of sigmoidoscopy reported from Turkey,[9] to 89% yield reported from India.[10] This difference is most likely age related as the study from India is reporting on children between 8 months and 2 years, whereas the Turkish report deals with a range of children between 8 months and 14 years. The higher yield in younger children reported from India is also documented in our study.

The pattern of causes of rectal bleeding depends on the general pattern of gastrointestinal conditions. In a patient presenting with bleeding per rectum, the source may be proximal to the ligament of Treitz in cases of melena caused by slow bleeding from esophagogastroduodenal inflammation, or hematochezia caused by profuse bleeding from peptic ulcer disease. In these cases, colonoscopy will be normal and the initial diagnostic procedure, perhaps suggested by a gastric aspirate positive for blood, is upper gastrointestinal endoscopy. Colonoscopy is also expected to be normal in cases of BPR caused by lesions located anywhere from the ligament of Treitz to the cecum. These latter possibilities may affect the yield of colonoscopy, but obviously have nothing to do with the accuracy of the procedure. In the present study, colitis, which typically presents with bloody mucosa diarrhea was the most common cause of BPR 53%. In children presenting in this way, the yield of colonoscopy was the highest (97%). A similar pattern has been reported from India by Yachha et al[11] where colitis accounted for 42%. The next common causes of BPR were polyps, almost all of them are solitary juvenile, and presenting with painless rectal bleeding.[12,13] In this study, polyps were accounted for 27% of the causes of BPR. The higher proportion (41%) was reported from India, but still was the second most common cause.[11] Again, it seems that these patterns reflect the general pattern of diseases in different communities. The accuracy of colonoscopy in identifying polyps depends largely on the ability to examine a well-prepared colon to the cecum. In view of the demonstration that polyps can be found beyond the sigmoid or even the left colon, polyps cannot be excluded unless the entire colon has been examined. This is consistent with the recommendation that pancolonoscopy should be the procedure of choice especially in children with BPR.[14,15] The remaining causes of rectal bleeding are rare but of interest. Solitary rectal ulcers are rare and frequently unrecognized cause of rectal bleeding in children. However, this condition, which presents in the form of rectal bleeding associated with mucus discharge, tenesmus, and perianal pain has been reported more often in children from developing countries.[16] Four and 3 cases were found in 2 separate reports from India[10,11] 4 cases, from Turkey[9] and 7 from Kuwait.[17] In this study, there were 3 cases of solitary rectal ulcers, accounting for 5% of the causes of BPR. The role of colonoscopy in the diagnosis and management of intussusception has been reported in children.[18,19] A case of ileo-colic intussusception was diagnosed by colonoscopy in a 5-month-old boy and easily reduced by air insufflation. Linear colonic erosions were the only finding in a 5-year-old boy with behavioral disorders including eating glass and presenting with intermittent hematochezia. A causal relationship is possible. However, review of the literature did not reveal similar association. Finally, when all investigations do not reveal the cause and the problem persists or becomes recurrent in a healthy-looking child, it is worth considering Munchausen syndrome by proxy which may present with recurrent complaints of rectal bleeding fabricated by a disturbed mother.[20]

In conclusion, provided patients are well selected for colonoscopy, the diagnostic yield of this procedure is very high especially in cases of BPR associated with diarrhea.

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