AN ASSESSMENT OF THE CAUSES OF LOWER GASTROINTESTINAL BLEEDING IN A CHILDREN’S HOSPITAL IN NORTHEASTERN ROMANIA

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Abstract: The aims of this five-year retrospective study was to investigate the common etiologies, clinical, biological and pathological patterns of lower gastrointestinal bleeding in children from a hospital center in northeastern Romania. We included in the study 118 children with lower gastrointestinal hemorrhage or two consecutive positive fecal occult blood tests. Patients were divided into three age groups (0-2 years, 3-10 years, 11-18 years) and the findings were reported separately for each group. Gastrointestinal bleeding was more common among 3-10-year-old children. Hematochezia was the most common form of presentation (54.2%), followed by rectorrhagia (40.7%). Each patient underwent a colonoscopy with biopsy mapping. The most common colonoscopy finding was solitary colorectal polyps in 39 cases (33.1%), followed by suggestive aspects for ulcerative colitis in 26 patients (22.0%); only 15 (12.7%) were histologically confirmed. Endoscopic polypectomy was performed in all cases. We report two perforations and one hemorrhage that required surgery.

Key words: children; gastrointestinal hemorrhage; pediatrics; hospitals; Romania.

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INTRODUCTION

Gastrointestinal bleeding is an important health problem in pediatric pathology, most often felt by parents and caregivers as a dramatic one, depending on the extent of blood loss. Its diagnosis and treatment requires experience and the good coordination of the medical team caring for the patient.

The gastrointestinal tract is a highly vascularized organ with a large surface area so that bleeding can occur at any level. Lower gastrointestinal bleeding is defined as a bleeding that comes from the intestine below the duodenojejunal flexure (ligament of Treitz) (Rayhorn et al., 2001). In pediatric practice, various etiologies for lower digestive hemorrhage are described, from benign conditions requiring no treatment to severe and life-threatening etiologies that involve immediate intervention (Barnert, 2008). Etiological aspects also vary depending on different age groups, which makes the differential diagnosis more difficult sometimes.
PATIENTS AND METHODS

We conducted a descriptive retrospective study over a period of 5 years (June 2008-June 2013) in order to determine the etiologies of lower gastrointestinal bleeding in children admitted to our children’s hospital in northeastern Romania (“St. Mary” Children’s Emergency Hospital, Iasi, Romania).

Patients

The patients consisted of children aged <18 years who presented lower gastrointestinal bleeding exteriorized through rectorrhagia, hematochezia or through at least 2 positive fecal occult blood test spaced by at least one week. The data were collected from patient charts and the records of endoscopic procedures. The patients were divided into 3 groups according to age: 0-2 years, 3-10 years, 11-18 years. We excluded from the series children who needed emergency surgery, patients in whom a clear cause for the lower gastrointestinal bleeding such as infectious gastroenteritis was established, patients admitted for follow-up colonoscopy, those who had ingested substances that could be confused with false hemorrhage e.g. fruits and vegetables that contain peroxidase such as broccoli, radish, melon, tomatoes – including juice and sauce, and beet soup like borscht, blueberries, food with red colorants, red energy drinks, red pepper, iron supplements and bismuth salts. (Karjoo, 2013)

Methods

All children in the study were investigated by colonoscopy/rectosigmoidoscopy after the procedure had been explained to the parents and an informed consent obtained. The investigation required an intestine (12-24 h) previously prepared with polyethylene glycol solutions or small enema. Patients were under general anesthesia with propofol or conscious sedation with midazolam, depending on age. The examination was performed by a pediatric gastroenterologist using a Pentax EPM 330 size 11 mm colonoscope. Biopsies were taken under direct visualization of the mucosa. Statistical analysis was performed using SPSS 16 software, version 16.0.

RESULTS

We included 118 patients in the study with documented lower gastrointestinal bleeding admitted...
to our hospital in the study period, their age ranging from 1 month to 18 years. The median age was 91.40±28.2 months (range 1-216 months). Of these, 51 were girls (43.2%) and 67 (56.8%) were boys (Fig. 1). The distribution by age groups was 15 patients (12.7%) in age group 0-2 years, 65 (55.1%) in the 3-10 year group, 38 (32.2%) in the 11-18 year group. No newborns were included in the study (Fig. 2).

The main reason for presentation was hematochezia in 64 cases (54.2%), followed by rectorrhagia in 48 cases (40.7%), and positive test for occult bleeding in 6 situations (5.1%). The most common clinical findings were abdominal pain in 31 children (26.3%), followed by bloody diarrhea in 8 (6.8%) and 4 patients (3.4%) with fever and weight loss; 75 children (63.5%) were free of any additional symptomatology. Colonoscopy was performed within 12 h of presentation in 23 cases (19.5%), in the first 24 h in 87 cases (73.7%) and after 24 h in 8 (6.8%) patients. Colonoscopy findings included solitary colorectal polyps in 39 cases (33.0%), with a diameter between 0.5 and 1.5 cm – all underwent endoscopic polypectomy during the same session; this was followed by suggestive aspects for ulcerative colitis in 26 cases (22.0%), non-specific lesions such as local or disseminated inflammation, erythema, decreased or increased vascular marking and fissure in 22 cases (18.6%), and anal fissures in 21 cases (17.7%). In smaller percentages we also found rectal ulcers in 4 cases (3.4%), intestinal polyposis in 4 cases (3.3% – 2 cases of Peutz-Jeghers syndrome, 1 case of Bannayan-Riley-Ruvalcaba syndrome (BRRS), 1 case of Gardner syndrome), rectal diverticulum in 1 case (0.8%) and 1 case of vascular malformations (0.8%) as causative factors (Fig. 3).

Hypochromic microcytic anemia as a direct consequence of bleeding was found in 73 children (61.9%), hemoglobin values ranging from 6.3 mg/dl to 12.9 mg/dl, median value 10.8±2.4. In four cases (3.3%), a red blood cell transfusion was required.

Biopsy specimens were nonspecific in 33 cases (27.9%), while the most common histological aspect was juvenile polyp in 39 cases (33.1%), a histological normal aspect in 23 cases (19.4%) and ulcerative colitis in 15 cases-12.7% (Fig. 4).
The origin of lower gastrointestinal bleeding varies with age, most common etiologies being nonspecific lesions (54.5%) in children aged 0-2 years, colorectal polyps (74.3%) in the age group of 3-10 years and ulcerative colitis (61.5%) in 11-18 years group (Fig. 5).

Following the distribution of etiology by gender, we found that colonic polyps prevailed in males (66.6%); in females we found mainly ulcerative colitis and anal fissures, 69.2% and 52.3% respectively (Fig. 6).

**DISCUSSION**

Lower gastrointestinal bleeding is an alarming event for children and parents and requires further investigation. Previous reports have shown that rectal bleeding in children is often a benign condition, which does not require treatment but only supportive care measures (Boyle et al., 2008; Zahmatkeshan et al., 2012). Lower gastrointestinal bleeding predominates in males but the difference is not statistically significant (p <0.1), a fact demonstrated in other studies by Zahmatkeshan et al. (2012) and Motamed et al. (2008). The most common etiology in our study was colorectal polyps followed by nonspecific lesions and ulcerative colitis. Comparing the results of our report with regard to the etiological aspects for lower digestive hemorrhage, we notice that they do not vary greatly from other studies. The most common cause of lower gastrointestinal bleeding in Middle East populations is colorectal polyps (Zahmatkeshan et al., 2012) and polyps prevail as an etiological factor in Western populations (Durno et al., 2007), with data which are similar to those from our study. Among the Egyptian population, the most common cause of lower digestive hemorrhage is infectious colitis followed by colorectal polyps (El-Khayat et al., 2006). In the Chinese pediatric population, studies have shown that the three most frequent causes of this pathology are colorectal polyps, chronic colitis and intussusception (Yu Bai et al., 2012; Rayhorn et al., 2001).

Age is a factor that differentiates the etiology of gastrointestinal bleeding in the pediatric popu-
lower gastrointestinal bleeding in children

Our study shows that this condition had a higher incidence in the age group 3-10 years, being rather rare under the age of 1 year, as other authors have suggested (Zahmatkeshan et al., 2012), and the main etiology is colorectal polyps, findings which are similar to other reports (Rayhorn et al., 2001). The most common form of polyps in all ages is juvenile polyps, which are usually solitary polyps, as revealed by our study. We had only four cases of intestinal polyposis, framed within the known symptoms of this condition, where we found multiple lesions sized between 0.5 and 2 cm.

Ulcerative colitis and Crohn’s disease are possible etiologies of lower gastrointestinal bleeding, especially in the age group of 11-18 years. Previous studies have shown that approximately 20% of patients with inflammatory gastrointestinal disease are diagnosed before the age of 20 (Yu Bai et al., 2011). In our study, ulcerative colitis affected 12.7% of all patients. By making a comparison with other reports carried out in Western populations (Fox, 2000), it represents a higher percentage and also an alarm signal that requires future investigations. Anal fissures are a quite an important etiology, accounting for 17.7% of all cases in our series; they occur secondary to chronic constipation, a condition found mainly in toddlers and schoolchildren (Leung, 2002).

The most common presentation form was hematochezia, followed by rectorrhagia, results that are similar to the data found in other studies (Moravej, 2013). Lower gastrointestinal bleeding in children rarely causes acute hemodynamic disorders or severe anemia. Pasricha et al. (2010) revealed in a study that pediatric patients with iron deficiency anemia show lower absorption of iron; an occult bleeding source was rarely found. We cannot extrapolate these data to our study; further investigation should be made to elucidate if anemia was the direct consequence of blood loss or if it was determined by a low absorption of iron in this category of patients. This report highlights the importance of colonoscopy in patients with lower gastrointestinal bleeding, both for diagnostic and therapeutic purposes, a fact evidenced by other researchers (Davila et al., 2005; Thomson, 2004; Clarke et al., 2005).

Our study had several limitations. We excluded from the study cases that needed emergency surgery; thus, no data are available for patients who had lower digestive hemorrhages caused by a number of diseases such as intussusception, volvulus, necrotizing colitis, toxic megacolon. We also excluded from the study patients with a definite cause of the gastrointestinal bleeding, such as infectious gastroenteritis. Nonetheless, this study is the only report in this area regarding the characteristics of lower digestive bleeding in children.

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