ORIGINAL ARTICLE

Poor endoscopic findings in children with non variceal upper gastrointestinal bleeding: is biopsy necessary?

Giannakopoulos A[1], Logothetis A[1], Panayiotou J[1], Van-Vliet K[2], Orfanou I[1], Roma-Giannikou E[1]

[1]1st Department of Paediatrics, University of Athens, "Aghia Sophia" Children's Hospital, Athens, Greece
[2] Histopathology Department "Aghia Sophia" Children's Hospital, Athens, Greece.

Abstract

Background: Gastrointestinal bleeding in infants and children is a potentially serious condition in the practice of general pediatrics that requires investigation. The objective of this study is to describe the endoscopic and histopathological findings in children with upper gastrointestinal (UGI) bleeding of non variceal origin.

Patients and Methods: We performed a retrospective study of the medical records of 181 children, aged 1 month to 15.2 years, with non variceal UGI bleeding, who were admitted in our department over the period 1988-2008 and underwent upper GI endoscopy accompanied by histology. Patients were divided in 4 groups according to their age (A=0-1 years, B= 1-6 years, C=6-12 years, D= 12-16 years).

Results: An endoscopically evident bleeding source was detected in only 5% of all patients. Histological examination revealed increased incidence of eosinophilic infiltration in infants, in contrast to all other age groups, where non-specific or H. pylori related inflammation predominated. Peptic ulcer was found in 4.4% of all patients.

Conclusion: Although an evident bleeding source was detected in only a small percentage of patients, the accompanying histological examination provided additional information regarding possible underlying diseases and contributed to the subsequent therapeutic management. Hippokratia 2010; 14 (4): 261-264

Key words: upper gastrointestinal bleeding, hematemesis, melena, children

Corresponding author: Eleftheria Roma-Giannikou, 1st Department of Paediatrics, University of Athens, "Aghia Sophia" Children's Hospital, Athens, Greece, Email: roma2el@otenet.gr, Tel: 0030 210 7467892, Fax: 0030 210 7759167

Upper gastrointestinal (UGI) bleeding, which by definition originates proximal to the ligament of Treitz, is classically presented in children with hematemesis and / or melena. The main causes of non-variceal UGI bleeding are ulcers, reflux esophagitis, non-steroidal anti-inflammatory drug induced gastritis and ectopic gastric mucosa[1]. The priority in the management of these patients is the assessment of the severity of blood loss and the stabilization of hemodynamic status. Currently endoscopy is the principal method used to identify the source of bleeding and to perform, if necessary, therapeutic procedures such as electro/photocoagulation and injection of vasoconstrictive agents [2]. Studies concerning the endoscopic investigation of UGI bleeding in children are limited, especially those that are accompanied by histopathological examination. We performed a retrospective, age-group based, analysis of the endoscopic and histological findings of all children with non variceal UGI bleeding, who underwent upper GI endoscopy accompanied by histology. In addition, we report the H. pylori status in these patients and discuss its role in this context.

Materials and methods

All children with UGI bleeding, who were admitted to our hospital, a major referral centre for gastrointestinal diseases, over a 20 year period (1988-2008) and underwent endoscopy accompanied by biopsy sampling, were retrospectively assessed by review of their medical records, following approval of the local Ethical Committee. A total of 181 children (125 males) aged 1 month – 15.2 years were divided into the following age groups: A=0-1 years, B= 1-6 years, C=6-12 years, D= 12-16 years. Patients with UGI bleeding of variceal origin (23 children) were excluded from the study as well as patients with apparent bleeding from the oropharyngeal cavity. In all patients endoscopy was performed within 36 hours after admission, unless it was not self-restrained, in which case, it was done within 12 hours. The majority of children (88%) with UGI bleeding on admission were given anti-secretory agents (H2 receptor antagonists or proton pump inhibitors) which is common practice in general pediatric departments. Prior to endoscopy coagulation profile was obtained from all patients which was ubiquitously normal. Over the whole study period, endoscopies were performed by the same two pediatric gastroenterologists (ER and JP). General anesthesia or sedation with intravenous diazepam or midazolam was used. A site of gastrointestinal tract was considered positive for bleeding when active arterial spurting or oozing of blood or a fresh or old blood clot was detected by endoscopy. Following our

protocol, 2 biopsy specimens from the lower third of esophagus, 1 from gastric corpus, 3 from gastric antrum (for histology, culture and rapid urease test) and 2 from the duodenal bulb were obtained from all patients. Endoscopic evaluation and histopathological analysis was performed according to the updated Sydney system[3] after sample preparation and staining with Haematoxylin-Eosin and modified Giemsa. The eosinophilic infiltration was considered increased when eosinophils were >20 per high power field (HPF) for the stomach and duodenum and >5 HPF for the esophagus. For the detection of H. pylori, tissue cultures, the rapid urease test (CLO test Delta West Limited, Bentley, Western Australia) and the urea breath test (13C-UBT, INFAI GmbH Bochum, Germany) were used in addition to histology. H. pylori status was considered positive if tissue culture was positive. In the absence of a positive tissue culture, for those children having a single positive test (histology or CLO), UBT was used as a second test to confirm H. pylori infection. An age group-based analysis for symptoms, endoscopic and histological findings was performed. Chi-square and Fisher's exact tests were used for statistical comparisons. P values of less than 0.05 were considered of statistical significance.

Results

The median age of children who underwent upper GI endoscopy was 6.1 years (range 15 days to 15.2 years) and the overall male/female ratio was 2.23 / 1. The endoscopic and histological findings of all 181 children with UGI bleeding according to age group are shown in table 1. Hematemesis was the prevalent clinical sign of UGI bleeding in all age groups.

An evident bleeding source was found in only 9 patients (5%) with the higher incidence (9.1%) observed in group D (Table 1). The presenting symptom in all the above cases was hematemesis. Among the children with an evident source of bleeding, the hemorrhagic lesions were found in the antrum (5 patients) and duodenal bulb (4 patients).

Histopathological analysis demonstrated an increased eosinophilic infiltration in the A group (60.9%, $P < 0.001$). Non specific inflammation predominated in all other groups (Figure 1a). H. pylori was detected in 26 of all children (14.7%) with an incidence of 4.5%, 18.8 % and 45.5% in groups B,C and D respectively (Figure 1b). Only 8 (4.4%) of all patients had ulcers which none of them was accompanied by active bleeding. In five patients the ulcerative lesion was located at the antrum while in 3 patients ulcer was detected at the duodenal bulb. Among all patients with ulcer (n=8), six patients that belong to groups B, C and D were infected with H. pylori, whereas 2 patients of group B were not infected (Figure 1b).

Discussion

An evident bleeding source was detected in only 5 % of all patients. A previous review by Ament et al[3] reported an identification rate of bleeding by endoscopy in more than 80% of patients including though also cases with bleeding of variceal origin. The exclusion of such patients from our analysis probably contributed to the

Table 1: Endoscopic and histological findings according to age group in 181 children with UGI bleeding (N = number of patients)

Age group	N (males)	Evident bleeding source		Hematemesis		Melena		Histopathological examination						Ulcer		H. pylori positive	
								Esophagitis		Gastritis		Duodenitis					
		N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
A 0-1 years	23 (15)	1	(4.3)	21	(91.3)	2	(8.7)	11	(47.8)	12	(52.2)	11	(47.8)	0	(0)	0	(0)
B 1-6 years	67 (41)	2	(6)	41	(61.2)	26	(38.8)	19	(28.4)	24	(35.8)	24	(35.8)	5	(7.5)	3	(5.5)
C 6-12 years	69 (43)	3	(2.9)	53	(76.8)	16	(23.2)	23	(33.3)	36	(52.2)	32	(46.4)	1	(1.4)	13	(18.8)
D 12-16 years	22 (26)	3	(9.1)	21	(95.5)	1	(4.5)	10	(45.5)	12	(54.5)	12	(54.5)	2	(9.1)	10	(45.5)
Total	181 (125)	9	(5)	136		45		63	(34.8)	84	(46.4)	79	(43.6)	8	(4.4)	26	(14.7)

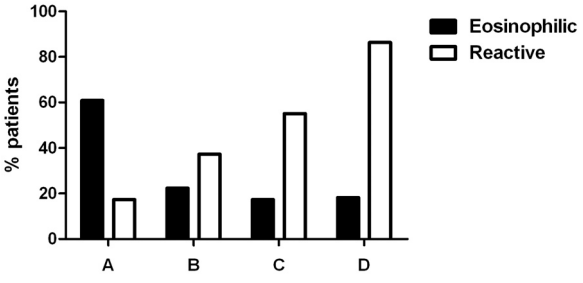

Figure a: Type of inflammation (eosinophilic on non specific) based on histological examination, according to age group.

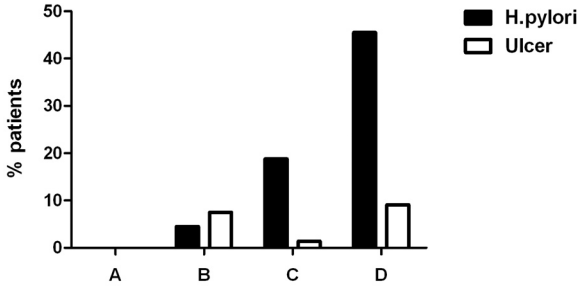

Figure b: Frequency of H. pylori and ulcer according to age group.

low detection rate seen in our study. In the present retrospective study all patients with a variceal origin of bleeding were excluded because our aim was to evaluate the frequency of detection of a bleeding site and correlate it with the underlying histopathological findings as well as the H. pylori infection. Additional factors that may have negatively influenced the detection rate of bleeding site is the time between endoscopic examination and patient's hospital admission as well as the common administration of proton pump inhibitors or H2-receptor antagonists prior to endoscopy. The percentage of our patients treated with anti-secretory agents prior to endoscopy was 88 %. During the first decade (1988-1998) H2- receptor antagonists were the first choice of anti-secretory therapy replaced gradually by proton pump inhibitors in the second decade, especially in children above infancy. Moreover, since superficial gastric mucosal lesions mainly due to viral infections is the most common finding among children with UGI bleeding[4], healing is rapid and is enhanced by the common use of anti-secretory treatment prior to endoscopy.

The male preponderance, found in our study, has also been reported by Houben et al[5] and Huang et al[4], who found a male/female ratio of 2.6:1 and 2.3:1 respectively in retrospective analyses of patients with age ranges comparable to ours. Male dominance has been found to be more pronounced in the subgroup of patients with duodenal ulcers[5]. This gender bias has been attributed by some authors to the influence of testosterone, an argument based on animal studies that showed a protective effect of estrogen on gastric acid induced duodenal injury[6]. In our study though, duodenal ulcers comprise a very small proportion in patients with UGI bleeding (1.1%) and consequently the cause for this gender bias remains unclear.

Histological analysis revealed the predominance of eosinophils during infancy. Since there is no reliable test to diagnose the food allergy of GI tract we considered cow's milk allergy to be the main cause of eosinophilic infiltration during the first year of life. Therefore a hypoallergic formula was introduced to infant's diet. No relapse of UGI bleeding was observed in all patients (n=23) of this age group during the 12- month follow-up. However, with the exception of the one patient, no second endoscopic examination was performed. A second endoscopic examination was performed in only one 2 month patient with severe hemorrhagic gastritis 6 months after introduction of elemental formula with remarkable reduction of eosinophilic infiltration. On the contrary, non specific inflammation was found mainly in older children which has been related to preceding viral infections[4], H. pylori infection[7] or NSAID gastropathy[8].

H. pylori was detected only in patients older than 2 years of age showing an increasing frequency with advancing age and was strongly correlated with gastritis. This correlation has also been previously reported[9-11]. The presence of ulcer was related to H. pylori positive status with the exception of 2 patients of age group B. It is known that peptic ulcers have a relatively infrequent occurrence in young children [9] with most of them being typically secondary to systemic illnesses or drugs[12-14]. Higher incidence of H. pylori has been reported in children of countries with increased prevalence of ulcers[4,5].

In conclusion, this study showed that endoscopy performed after an episode of upper gastrointestinal bleeding had an overall low yield in detecting an evident source of bleeding, especially when performed with a delay or preceded by anti-secretory treatment. According to the above, we suggest that the role of endoscopy in UGI bleeding in children should be reconsidered. The positive histopathological findings in the absence of endoscopic evidence of bleeding seem to contribute to better therapeutic management, justifying therefore the endoscopic examination, only when combined with biopsy.

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