

Upper Gastrointestinal Endoscopic Findings in Children at Rapareen Teaching Hospital in Erbil, Iraq

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Abstract

Background: Gastrointestinal disorders are a frequent health problem in children and information on digestive disease in children is lacking in most developing countries. The development of flexible esophagogastroduodenoscopy (EGD) with small diameter and the practice of the pediatricians have made gastroscopy feasible at all ages and promote more precise diagnosis and plan for therapy. **Objectives:** It has been carried out to demonstrate indications and findings of endoscopy in children. **Materials and Methods:** An observational study involved all patients who underwent upper gastrointestinal endoscopy at Rapareen Teaching Hospital for pediatrics during the period from April 1, 2019 to March 1, 2020. **Results:** During the study period, 84 patients underwent EGD. The mean age of patients was 6.99 ± 3.84 years ranging from below 1 year up to 14 years, majority of patients were above 5 years of age, and males constitute 65.5% of the study sample. Higher the age (whether mean or above 5 years) the more prone to have abnormal findings and upper gastrointestinal bleeding was the most common indication, while gastritis was the most frequent finding (34, 29.5%). **Conclusion:** Upper GIT endoscopy is an important tool in digestive disease diagnosis and most children referred had abnormal findings aid decision making and further management. Upper GIT bleeding was frequently reported and higher proportion of patients were male predominantly above 5 years of age.

Keywords: Children, endoscopy, gastrointestinal, pediatric

INTRODUCTION

Gastrointestinal disorders are a frequent health problem in children and information on digestive disease in children is lacking in most developing countries.^[1]

Endoscopy has become a cost-effective and valuable procedure in many pediatric digestive disorders with rapid technological progress in this sector.^[2] Esophagogastroduodenoscopy (EGD) in children has altered over the last four decades since establishment in the early 1970s with an expanding diagnostic and therapeutic applications lately.^[3]

Despite its high diagnostic outcome, upper gastrointestinal endoscopy (UGITE) is still less used and information about its efficacy is limited in most of the developing countries.^[4] This may be explained by lack of awareness regarding its role as diagnostic modality in children and deficiency of well-trained pediatrician accompanied by skilled staff, all once available, prevents referring these patients to a center where the scope is available.^[5] In parallel with the growth of pediatric gastroenterology, disorders that require EGD for diagnosis

have shown a rising incidence of diagnosis.^[6] This rise due to changing endoscopy practices over 20 years conversely accompanied by decrease severity of such diseases as reported in 2010 in the USA^[7] The development of flexible EGD with small diameter and the practice of the pediatricians have made gastroscopy feasible at all ages including the newborn.^[8]

Previous literatures documenting endoscopic indications and findings in children were mainly from developed states,^[7] and few studies are available from developing countries, especially from sub-Saharan Africa. In Sudan, the most common indication for EGD was hematemesis (24%), followed by portal hypertension (21%), while the substantial scope findings were esophageal varices (16%) then gastritis (7%).^[9]

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In Uganda, gastropathy and ulcers were found to be the most frequent endoscopic findings.^[5]

Objectives

This study aimed to identify sociodemographic and clinical data of patients who underwent upper gastrointestinal tract (GIT) endoscopy as well as determine scope findings.

MATERIALS AND METHODS

An observational study was carried out at the Endoscopy Unit, Rapareen Teaching Hospital for pediatrics during the period from April 1, 2019 to March 1, 2020. The pediatric gastroenterology and endoscopy units have been established in March 2019 in Rapareen Teaching Hospital, Erbil, located in North of Iraq and is the second pediatric specialized unit all over the country.

All patients who underwent UGITE were included in this study and those children underwent the procedure under ketamine and midazolam anesthesia aided with topical lignocaine gel. A Pentax fiber optic upper gastrointestinal (UGI) scope (different sizes with outer diameter of 11 and 8.8 mm) is passed through the mouth of the child in the left lateral position to the upper esophageal sphincter into the esophagus then the stomach and duodenum. Cases consisted of children 0–14 years' old and those with unclear medical records or with missing values were excluded.

Informed written consent was obtained from caregivers for the procedure after explaining procedure details.

Data were analyzed using SPSS (Statistical Package for the Social Sciences) version 25 (SPSS, IBM Company, Chicago, USA). Frequencies and means of various variables were calculated.

RESULTS

During the study period, 84 patients underwent EGD. The mean age of patients was 6.99 ± 3.84 years ranging from below 1 year up to 14 years with median of 8 years, mean of lower esophageal sphincter position was 29.45 ± 4.19 cm, and median of 30.5 cm. Majority of patients were above 5 years of age and males constitute 65.5% of the study sample [Figure 1 and Table 1].

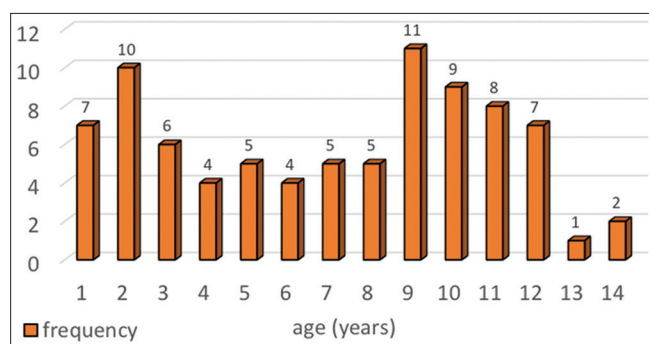


Figure 1: Frequency of patients underwent endoscopy at different age groups

Table 1 summarizes the various sociodemographic and clinical data including indications for referral and their endoscopic findings. Epigastric pain, followed by upper GIT bleeding was most frequent indications for endoscopy, while gastritis was more frequent finding during the procedure and come before lax lower esophageal sphincter identified during scope retroflexion. One of the patients had gastric angiodysplastic spots presented with hematemesis and was a case of Von Willebrand disease and another one had corkscrew esophagus highly suggestive of contractile disorder [Figure 2]. Many patients, especially suspected for *Helicobacter pylori* had nodular gastric mucosa as shown in Figure 2. Biopsies were taken (78.3%) from different parts including the esophagus, stomach, and duodenum according to baseline clinical

Table 1: Sociodemographic and clinical characteristics of children

	n (%)
Age (years)	
≤5	32 (38.09)
>5	52 (61.90)
Gender	
Male	55 (65.5)
Female	29 (34.5)
Indications	
UGIT bleeding	19 (22.6)
Anemia	9 (10.7)
Celiac	8 (9.5)
Epigastric pain	26 (31.0)
Vomiting	12 (14.3)
Dysphagia	7 (8.3)
Others	3 (3.6)
Endoscopic findings	
Yes	63 (75)
No	21 (25)
Characteristic endoscopic findings	
Esophagus	19 (22.6)
Lax	9 (10.7)
Esophagitis	5 (6.0)
Stricture	3 (3.6)
Dilatation	1 (1.2)
Corkscrew appearance	1 (1.2)
Stomach	44 (52.4)
Gastritis (congested, erosive)	29 (34.5)
Ulcer	3 (3.6)
Tear	2 (2.4)
Nodular appearance	5 (6.0)
Bile reflux	3 (3.6)
Angiodysplasia	1 (1.2)
Mass	1 (1.2)
Duodenum	7 (8.3)
Ulcer	3 (3.6)
Celiac	4 (4.8)
Biopsies were taken	
Yes	62 (73.8)
No	22 (26.2)

suggestions and UGI endoscopy indications; unfortunately, some of the biopsy results were returned back and we could not correlate with clinical and scope findings.

Table 2 demonstrates any association between those with abnormal endoscopic findings and certain demographic and clinical data. The older age group (>5 years) had more abnormal features compared to the younger group and was statistically significant and supported by even higher mean age among positive results. Among many indications, epigastric pain had upper GIT scope findings more than other, followed by upper GIT bleeding and vomiting. When tested each indication

to others, no significant association was discovered regarding gastroscopy findings [Table 2].

When compare endoscopic atypical findings with reasons for referral at different age groups, no significant relation was evident as revealed in Table 3.

DISCUSSION

UGITE is an important tool with different diagnostic and therapeutic indications; its utility among the pediatric age group had improved disease identification and management.^[2]

Most patients were above 5 years of age like other surveys, this could due to more obvious reasons to perform the procedure like persistent epigastric pain or other subjective complaints and were significantly more prone to have positive findings.^[8,10,11]

In this study, males were dominant among those referred despite it does not associated with increased frequency of abnormal scope findings. This is in contrast to previous reports,^[5,11] boys had nearly the same percentage as girls and this could be due to additional indications for counseling such as emergency cases like caustic injury while in our study majority were elective.

Despite the difference between reports throughout developing and developed countries regarding pediatric age group, epigastric pain and upper GIT bleeding were reported several times in previous literatures^[1,2,8,10,11] as common indications for endoscopy, but unremitting vomiting in this study showed a rising factor in contrast to other studies^[1,2] and 83.3% of them had abnormal findings. A retrospective research involved 200 children over the period of 4 years displays failure to thrive as the main purpose for consultation.^[5] A research involved

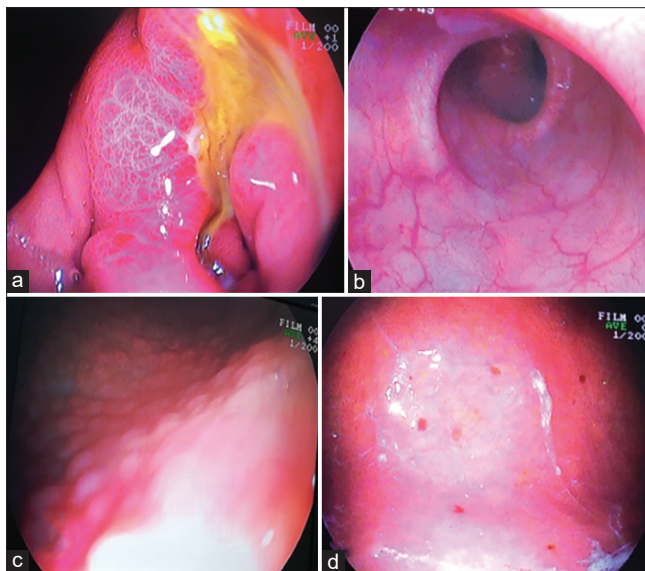


Figure 2: Some endoscopic findings. (a) Big circumferential ulcer near pyloric opening. (b) Corkscrew esophagus. (c) Nodular gastric mucosa. (d) Multiple gastric angiodysplasia

Table 2: Association of endoscopic findings with certain variables				
	Normal	Abnormal	P	OR
Age (mean±SD), years	4.714±3.349	7.746±3.715	0.001	
≤5	13 (40.6)	19 (59.4)	0.009	3.76 (1.34-10.56)
>5	8 (15.4)	44 (84.6)		
Gender (%)				
Male	14 (25.5)	41 (74.5)	0.895	1.073 (0.37-3.05)
Female	7 (24.1)	22 (75.9)		
Indications (%)			0.317**	
UGIT bleeding	4 (21.1)	15 (78.9)	0.893***	*
Anemia	4 (44.4)	5 (55.6)	0.605***	
Celiac	4 (50.0)	4 (50.0)	0.52***	
Epigastric pain	4 (15.4)	22 (84.6)	0.718***	
Vomiting	2 (16.7)	10 (83.3)	0.818***	
Dysphagia	2 (28.6)	5 (71.4)	0.936***	
Others	1 (33.3)	2 (66.7)	0.898***	
Biopsies (%)				
Taken	18 (29.0)	44 (71.0)	0.152	2.59 (0.68-9.85)
Not	3 (25.0)	19 (75.0)		

*OR: Risk estimate statistics cannot be computed. They are only computed for a 2×2 table without empty cells, **Exact Fisher test, ***Testing association of abnormal findings with each indication compared to total indications. OR: Odds ratio, UGIT: Upper gastrointestinal, SD: Standard deviation

Table 3: Association of indications at different age groups with endoscopic findings

Indications	Age (years)	Normal (%)	Abnormal (%)	P
UGIT bleeding	≤5	3 (30.0)	7 (70.0)	0.582**
	>5	1 (11.1)	8 (88.9)	
Anemia	≤5	2 (50.0)	2 (50.0)	1**
	>5	2 (40.0)	3 (60.0)	
Celiac	≤5	4 (80.0)	1 (20.0)	0.143**
	>5	0 (0.0)	3 (100.0)	
Epigastric pain*	≤5	0 (0.0)	0 (0.0)	
	>5	4 (15.4)	22 (84.6)	
Vomiting	≤5	1 (14.3)	6 (85.7)	1**
	>5	1 (20.0)	4 (80.0)	
Dysphagia	≤5	2 (40.0)	3 (60.0)	0.52**
	>5	0 (0.0)	2 (100.0)	
Others	≤5	1 (100.0)	0 (0.0)	0.33**
	>5	0 (0.0)	2 (100.0)	
Total	≤5	13 (40.6)	19 (59.4)	0.009
	>5	8 (15.4)	44 (84.6)	

*No case below 5 years had epigastric pain, **Exact Fisher test.
UGIT: Upper gastrointestinal

small sample (35) revealed vomiting with hypersalivation as prominent reason for OGD.^[3]

A patient known case of von Willebrand disease with a history of intractable anemia and hematemesis despite adequate factor therapy had multiple angiodysplastic lesions which supported by many previous reports.^[12,13]

The age of patients with these complaints was not a significant factor in predicting abnormal gastroscopy features,

Seventy-five percent of referred patients have abnormal scope manifestations, which is relatively high compared to other studies^[1,3,8] as 50% was the likely percentage of abnormality among examined children. The stomach was described as the most common site for most of OGD done in respect to the duodenum and esophagus.^[5,8]

Gastritis whether erosive or congestive was the dominant finding and this reflected in many reports^[3,8,11] and rate may be even higher if nodular gastropathy was added, but similar studies consider peptic ulcer among main causes, especially duodenal, and this may be justified by older age group sample in these literatures.^[1] Surprisingly, in a paper published in 2016 at Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, a substantial number of children with esophageal varices prevailed and could be elucidated to advanced unit with available interventional devices.^[10] Another review in Sudan^[9] has the same preceding results (19% esophageal varices and gastritis 7%), such variation may be justified by availability of interventional equipment for varices.

If there are nodular changes, erosions, and ulcers, especially in the antrum of the stomach or duodenum, *H. pylori* infection is highly suspected. A distinct nodular gastropathy, rarely detected during adult examinations, is a frequent endoscopic

manifestation and may be a pathognomonic finding of pediatric *H. pylori* infection.^[14]

Corkscrew esophagus is a rare motility and contractile disorder characterized by high amplitude peristaltic contractions in the distal esophagus. Clinical features include heartburn, dysphagia, or signs of gastroesophageal reflux disease. The etiology of corkscrew esophagus is still obscure.^[15]

CONCLUSION

Upper GIT endoscopy is an important tool in digestive disease diagnosis and most children referred had abnormal findings aid decision-making and further management. Upper GIT bleeding was frequently reported and higher proportion of patients were male predominantly above 5 years of age.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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