

Upper Gastrointestinal Endoscopy in Sudanese Infants and Children

Omayma Mohy Eldin Sabir¹, M O EH Gadour²

Abstract:

Background: Upper gastrointestinal endoscopy [UGIE] in children is safe and useful. Pediatric gastrointestinal endoscopy was introduced relatively recently in Sudan. The indications and patterns of endoscopic findings of UGIE in Sudanese children were not reported before.

Objectives: Our objective was to identify the indications and findings of UGIE among Sudanese children and to compare that with others' findings.

Patients and methods: The Demographic data of the first 200 children less than 15 years of age who underwent UGIE during January 2005 to December 2007 were retrieved from their files and analysed.

Results: Two hundred children had UGIE. Their ages ranged between 6 months and 15 years. 80 and 20 had UGIE because of hematemesis and abdominal pain respectively. 50 children had esophageal varices while peptic ulcer disease was found in 19. 65 out of 100 children who presented with failure to thrive, short stature, and persistent diarrhoea were found to have macroscopic duodenal lesions. 65 duodenal biopsies showed total villous atrophy. *H. pylori* infection and gastritis were found in 165 out of 180 biopsies [91.7%].

Ultrasound abdomen was performed in the 125 children who presented with hematemesis or abdominal pain. 20 out of the 52 who had ultrasonographic abnormalities were found to have cavernous transformation of the portal vein, whereas 10 children had features of liver cirrhosis.

Conclusions: The patterns of upper GIT diseases in the study population were comparable to literature. However, *H. pylori* infection and cavernous transformation of the portal vein were higher than reports from other parts of the world.

Key Words: cavernous transformation, portal vein, *H. pylori*, hematemesis, esophageal varices.

Introduction

The safety and usefulness of upper gastrointestinal endoscopy [UGIE] in children were well established. Nevertheless, complications may arise¹⁻⁴. With the recent advances in technology, endoscopy is becoming an essential component of modern diagnostic and therapeutic modalities in children. The widespread availability of non-invasive monitoring and short-acting sedatives facilitated the procedure. The indications for scoping children are more or less similar to those in adults⁵. However, unlike in adults, failure to thrive, persistent refusal to take food, limitation of usual activities and ingestion of a caustic material and foreign bodies are other common indications for UGIE in children. Sporadic UGIE for children were performed since the introduction of gastrointestinal endoscopy in Sudan in the fifties of last century. However, a dedicated unit for paediatric endoscopy was accomplished only recently.

Data on UGIE in Sudanese children were scanty. To the best of our knowledge there were no published reports concerning the indications or findings of UGIE in children in Sudan. In this paper we retrospectively reviewed the data of the patients who had UGIE in this relatively new unit and compared our findings with reports from other parts of the world.

1. Associate Professor, Faculty of Medicine, Al Nileen University, Consultant Paediatrics Gastroenterologist
2. Assoc. Prof. of Medicine. Department of Medicine. Omdurman Islamic University. Khartoum, Sudan.

Objectives

Our objective was to identify the indications and findings of UGIE among Sudanese children and to compare that with international literature.

Patients and methods

This study was conducted at Jafar Ibn Auf Children Hospital, Khartoum, Sudan, which is a tertiary care paediatric hospital and represents the only centre with established paediatric endoscopy unit in the country. The demographic data of the first 200 children less than 15 years of age who underwent UGIE during January 2005 to December 2007 were retrieved from their files and analysed. History, clinical examination, basic investigations and UGIE were reviewed. Endoscopic biopsies were taken when appropriate and ultrasound abdomen was done when indicated.

Pre endoscopic preparation

Informed consents from parents were taken. All children less than six months had pre-endoscopic fasting for four hours while those below three years of age and older children fasted for six and eight hours respectively according to the guidelines of The American Academy of Pediatrics⁶.

Intravenous midazolam [0.1mg/kg] and/or pethidine [1mg/kg] were given as pre-medication according to the need. All children had nasal oxygen throughout the procedure and were monitored with pulse oximetry.

Olympus paediatric gastroscopes [GIFP3] were used for the procedure. Gastric and small bowel biopsies were examined with light microscopy after staining with Heamatolexin and Gimsa Stain

Results

Two hundred children had UGIE. Sixty were less than two years of age and 140 were between two and fifteen years. Eighty children had gastroscopy because of hematemesis. Some had more than one indication for endoscopy [Table I].

Table I. The indications for UGIE in 200 children.

Indications	No	%
Failure to thrive, short stature, persistent diarrhoea	100	50
Hematemesis	80	40
Recurrent vomiting	35	17.5
Chronic abdominal pain	20	10
Foreign body removal	2	1

Of the 20 children who presented with abdominal pain eight were found to have reflux esophagitis, nine had gastritis, six had duodenitis and DU, and one had normal endoscopic findings.

Mallory Weiss tear was seen in two patients, whereas gastric mass was seen in only one patient. Fifty children had oesophageal varices and peptic ulcer disease was seen in 19 ones. More than one pathology were seen in some children. [Table II].

Table II. The endoscopic findings of the 200 patients.

Endoscopic findings	Number of patients*
Abnormal duodenal mucosal appearances (duodenitis, atrophied mucosa, scalloping and nodular appearance, etc...)	170(85%)
Gastritis	180(90%)
Oesophageal varices	50(25%)
Reflux Oesophagitis	80(40%)
Hiatus hernia	50(25%)
Oesophagitis	40(20%)
Duodenal ulcer	15(7.5%)
Gastric ulcer	04(02%)
Oesophageal stricture	04(02%)
Mallory Weiss tear	02(01%)
Gastric mass	01(0.5%)
Normal appearance	02(01%)

* more than one pathology appeared in some patients.

Sixty five out of hundred children who presented with failure to thrive, short stature, and persistent diarrhoea were found to have macroscopic duodenal lesions on endoscopy [Table III].

Table III. Endoscopic findings in 100 children presented with failure to thrive, short stature, and Persistent diarrhoea

Endoscopic findings	*No [%]
Abnormal duodenal mucosal appearances (duodenitis, atrophied mucosa, scalloping and nodular appearance, etc...)	65[65%]
Gastritis	85[85%]
Oesophagitis	50[50%]

* more than one pathology appeared in some patients.

One hundred and eighty biopsies were taken from the stomach and small bowel of the patients. Sixty-five duodenal biopsies showed total villous atrophy where as 45 had minimal mucosal changes. *H. pylori* infection was found in 165 [91.7%] of our patients. Table VI compares the prevalence of gastritis, *H. pylori* and duodenal ulcers in our study with some previous reports.

Table IV: *H.pylori* and endoscopic findings is our study compared to some other studies

Study	Country	<i>H. Pylori</i>	Gastritis	Duod. Ulcer	Year
Tam et al ⁷	U K	2%	NA	NA	1989
Odera et al ⁸	Greece	63%	63%	11.8%	1989
Das et al ⁹	India	66%	9%	NA	2003
Ayoola et al ¹⁰	KSA	16.6%	9.7%	5.6%	1999
Sabir and Gadour	Sudan	91.7%	91.7	7.5%	2007

NA = data Not Available

Ultrasound abdomen was performed in the 125 children who presented with hematemesis or abdominal pain. Fifty out of them had splenomegally and eight had hepatomegaly, twenty children had cavernous transformation of the portal vein. Beaded portal vein and signs of periportal fibrosis were seen in five children each, whereas 10 children had frank signs of liver cirrhosis. Seventy-three children showed no abnormality.

Discussion

Video endoscopy in children became well established as a safe and effective procedure for evaluation and management of various abdominal problems in children¹¹. In keeping with this, none of our patients had complications related to the procedure and we had good diagnostic yield. Half of the children in this study had UGIE because of failure to thrive, persistent diarrhoea and short stature. This high percentage is not consistent with reports from elsewhere¹⁰ and could be explained by the relatively poor general nutritional status, infections and illiteracy. Nevertheless, a significant proportion of patients in this group proved to have total villous atrophy, which may point to celiac disease as an important cause for failure to thrive and short stature in Sudanese children.

Eighty (40%) patients presented with hematemesis. This is higher than the figures, which were reported by Okello¹² [8.9%] and Ayoola¹⁰ [24%]. Fifty of those 80 (63%) patients had oesophageal varices. This was not a surprise because schistosomiasis is endemic in Sudan. Nevertheless, only five patients had ultrasonographic pictures suggestive of per-portal fibrosis.

Cavernous transformation of the portal vein is an uncommon cause of portal hypertension in children. Its aetiology is not well understood and some believe that it is a congenital deformity rather than a transformation¹³. The existence of isolated cavernous transformation of portal vein in 20 out of 52 children who had ultrasonographic changes in this study was rather high. Thorough search failed to reveal any of the predisposing factors for this transformation. This high lights the importance of cavernous transformation/deformity as a common contributor to portal hypertension in children and questions the ranking of periportal fibrosis due to schistosomiasis as the commonest cause of portal hypertension.

Eighty patients (40%) were found to have reflux oesophagitis. The presence of hiatus hernia in fifty children had probably contributed significantly to that. However, we could not find a good explanation for the high [25%] presence of hiatus hernia.

In contrast to other reports, none of the studied population had presented with corrosive ingestion. This could be, in part, due to non-accessibility to those products or families may not be aware of the existence and usefulness of the endoscopes in such cases. Only one patient had gastric mass and this goes with the rarity of solid

upper GIT tumours in children¹⁴. *H. pylori* infection and gastritis were strikingly high in the study population. That was not in keeping with reports from UK or KSA^{7, 10}. However, similar results were seen regarding duodenal ulcer in Saudi Arabia and Greece⁸. The extremely high rate of infection with *H. pylori* and the associated gastritis in our children [91.7%] are alarming signs as infection at a young age is believed to result in chronic atrophic gastritis and gastric cancer in adult life¹⁵, which deserve immediate action. The role played by *H. pylori* infection – directly or via its associated diseases- in failure to thrive in this study has to be verified. Only 10% of our patients had UGIE because of abdominal pain. This is in keeping with reports from Uganda but contradicts reports from other parts of the world¹².

Conclusions

UGIE is emerging as an important and safe diagnostic and therapeutic procedure in the practice of paediatric gastroenterology in Sudan. There is a good correlation between symptoms and endoscopic findings. The histopathology had confirmed the diagnosis in the majority of patients pointing to the good diagnostic yield of UGIE. The patterns of diagnosed upper GIT diseases in our population were comparable to literature despite few differences. However, *H. pylori* infection and cavernous transformation of the portal vein were higher than reports from other parts of the world. Is cavernous transformation of the portal vein ranks as the commonest cause of portal hypertension in children? This needs especial consideration and further studies.

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