

# Indications, Yield, and Safety Profile of Upper Gastrointestinal Endoscopy in the Paediatric Population at a Tertiary Care Centre

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**Abstract:** *Background:* Upper gastrointestinal endoscopy (UGIE) in children is one of the important tools in diagnosis and management of various GI disorders. However, data on the clinical indications, outcomes, and safety of UGIE in children- especially in resource-limited settings remain scarce. *Objective:* To evaluate the clinical indications, endoscopic findings, demographic patterns, and safety profile of upper gastrointestinal endoscopy (UGIE) in the paediatric population and to assess its role in the diagnosis and management of gastrointestinal disorders in children. *Methods:* This retrospective observational study included 150 paediatric patients ( $\leq 12$  years) who underwent UGIE between April 2023 and March 2024 at Department of Medical Gastroenterology, Osmania General Hospital, Hyderabad. Data on demographics, presenting complaints, comorbidities, procedural indications, and endoscopic findings were analysed using descriptive statistics. *Results:* The cohort had a mean age of 4.6 years, with 91 males (60.7%) and 59 females (39.3%). Common presenting symptoms were hematemesis (24%), abdominal pain (17.3%), corrosive ingestion (17.3%), and dysphagia (13.3%). Upper GI bleeding (24%) was the leading indication, followed by corrosive ingestion (17.3%) and dysphagia (12%). Comorbidities were noted in 71 patients (47.3%), including post-TEF repair (6.7%), acid/alkali ingestion (12.7%), and EHPVO (2.7%). Endoscopy findings were normal in 65 cases (43.3%). Abnormalities included esophageal varices (13.3%), strictures (13.3%), corrosive injuries (11.3%), gastritis/duodenitis (9.3%), and foreign bodies (7.3%). Rare findings (2%) included Mallory-Weiss tear, pyloric stenosis, and Peutz-Jeghers polyp. No major complications were reported; minor events were self-limiting. *Conclusion:* UGIE is a safe, effective, and clinically valuable procedure in paediatric populations, especially in high-risk scenarios like GI bleeding and corrosive ingestion. The correlation between presenting symptoms and endoscopic indications affirms appropriate procedural triaging. Although a substantial proportion of cases had normal endoscopy, the rate of significant findings supports its continued utilization in well-selected cases.

**Keywords:** Paediatric endoscopy, upper gastrointestinal bleeding, corrosive injury, strictures, foreign body, UGIE, portal hypertension, safety profile

## 1. Introduction

Upper gastrointestinal endoscopy (UGIE) has become an indispensable diagnostic and therapeutic tool in paediatric gastroenterology. It aids in evaluating symptoms such as gastrointestinal bleeding, dysphagia, and suspected foreign body ingestion, while also playing a crucial role in the management of portal hypertension and post-surgical complications.

Despite its increasing use, there is a paucity of detailed data on UGIE utilization patterns, especially in resource-limited settings. Furthermore, the relationship between patient demographics and UGIE outcomes remains underexplored. Understanding these patterns could improve procedural triaging, guide diagnostic expectations, and potentially reduce unnecessary interventions.

This study aims to evaluate the clinical indications, endoscopic findings, demographic patterns, and safety profile of paediatric UGIEs in a tertiary care setting. Additionally, it investigates the extent to which basic demographic

information- age and sex- can predict endoscopic findings or underlying indications, using statistical modelling.

## 2. Methods

### Study Design and Population

A retrospective, observational study was conducted based on a dataset of 150 paediatric patients who underwent upper gastrointestinal endoscopy (UGIE) in the Department of Medical Gastroenterology, Osmania General Hospital, Hyderabad, from April 2023 to March 2024 for a period of 1 year. Paediatric patients aged  $\leq 12$  years with documented clinical and procedural data were included.

## 3. Data Collection

The following variables were collected and compiled from endoscopy records and patient files:

- **Demographics:** Age, sex
- **Clinical presentation:** Presenting complaint
- **Procedure details:** Indication for UGIE, endoscopy findings

- **Medical history:** Comorbid conditions (e.g., corrosive ingestion, TEF repair)

### Endoscopic Procedure and Monitoring

All UGIEs were performed by experienced gastroenterologists using paediatric endoscopes under appropriate sedation protocols (intravenous sedation based on age, clinical condition, and procedure complexity). Standard preparation protocols were followed including pre-procedure fasting and consent from caregivers.

**Intra-procedure monitoring** included continuous assessment of:

- Oxygen saturation ( $\text{SpO}_2$ )
- Heart rate and respiratory rate
- Blood pressure
- Patient responsiveness and sedation level (if conscious sedation used)

**Post-procedure monitoring** was conducted in a recovery area for a minimum of 1–2 hours or until full clinical recovery, with observation for:

- Return to baseline consciousness and activity
- Vital signs stability
- Absence of adverse events such as bleeding, perforation, or aspiration

We observed no major complications in the study population.

## 4. Results

### 1) Demographic Characteristics

The study included a total of 150 paediatric patients who underwent upper gastrointestinal endoscopy. The mean age of the cohort was 4.6 years, with an age range of 0.5 to 12 years. There was a male predominance among the patients, with 91 males (60.7%) and 59 females (39.3%).

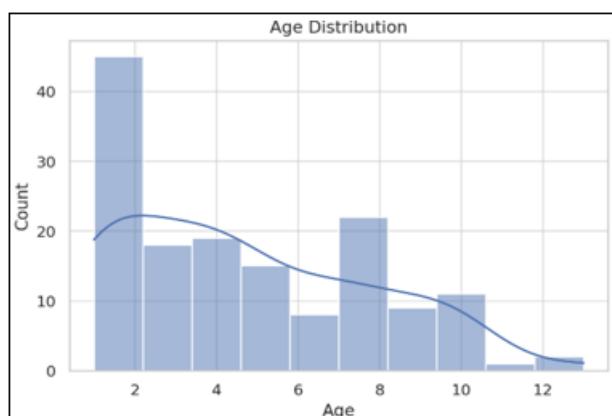


Figure 1: Age Distribution

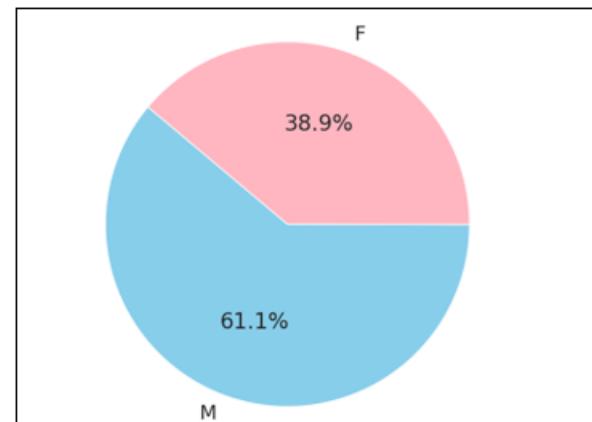


Figure 2: Sex Distribution

### 2) Presenting Complaints

The most common presenting symptom was hematemesis, observed in 36 patients (24%), highlighting the urgency of upper gastrointestinal bleeding as a key indication for endoscopy. This was followed by abdominal pain and corrosive ingestion, each reported in 26 patients (17.3%), reflecting both functional and toxic etiologies. Dysphagia was noted in 20 patients (13.3%), often associated with strictures or post-surgical complications. Other presenting complaints included vomiting in 13 patients (8.7%), foreign body ingestion in 12 patients (8%), diarrhoea in 5 patients (3.3%), and jaundice in 4 patients (2.7%). Additionally, other less common symptoms were seen in 8 patients (5.3%).

Table 1: Clinical presenting complaints

Presenting Complaint	Number(n)	Percentage (%)
Hematemesis	36	24.00%
Pain Abdomen	26	17.33%
Corrosive Ingestion	26	17.33%
Dysphagia	20	13.33%
Vomiting	13	8.67%
FB Ingestion	12	8.00%
Diarrhea	5	3.33%
Jaundice	4	2.67%
Others	8	5.33%

### 3) Indications for UGIE

The most common indication for upper gastrointestinal endoscopy was upper GI bleeding, noted in 36 patients (24%). This was followed by corrosive ingestion in 26 patients (17.3%) and dysphagia in 18 patients (12%). Other frequent indications included chronic abdominal pain in 14 patients (9.3%), foreign body ingestion in 13 patients (8.7%), and vomiting in 13 patients (8.7%). Less common indications were diarrhoea and jaundice, each seen in 5 patients (3.3%) and various others making up 21.3%.

Table 2: Indications for UGIE

Procedural Indication	Number(n)	Percentage (%)
UGI Bleed	36	24.00%
Corrosive Ingestion	26	17.33%
Dysphagia	18	12.00%
Pain Abdomen	14	9.33%
FB Ingestion	13	8.67%
Vomiting	13	8.67%
Diarrhea	5	3.33%
Jaundice	5	3.33%
Others (each $\leq$ 2 count)	32	21.33%

#### 4) Comorbidities

Comorbidities were documented in 71 patients (47.3%), with the most frequent being related to corrosive ingestion—acid ingestion in 13 patients (8.7%) and alkali ingestion in 6 patients (4%). Post-tracheoesophageal fistula (TEF) repair status was noted in 10 patients (6.7%). Other notable comorbidities included post-corrosive sequelae in 4 patients (2.7%) and extrahepatic portal vein obstruction (EHPVO) following variceal ligation in 4 patients (2.7%). A diverse group of other comorbid conditions accounted for approximately 33 patients (22%). No comorbidities were documented in 79 patients (52.7%).

#### 5) Endoscopic Findings

Among the 150 endoscopy cases, a normal study was reported in 65 patients (43.3%). The most common abnormal findings included esophageal varices in 20 patients (13.3%), predominantly low-grade in 14 patients and high-grade in 6 patients. Strictures were also observed in 20 patients (13.3%), with esophageal strictures seen in 17 patients. Of these, 9 patients had strictures post-tracheoesophageal fistula (TEF) repair, 7 had post-corrosive strictures, and 2 were of unknown etiology. Gastric strictures were noted in 3 patients. Corrosive injuries were present in 17 patients (11.3%), including 7 with low-grade ( $\leq 2a$ ) and 10 with high-grade ( $\geq 2b$ ) lesions as per Zargar classification. Gastritis or duodenitis was found in 14 patients (9.3%). Foreign body removal was performed in 11 patients (7.3%), with the object located in the esophagus in 4 patients, stomach in 6, and duodenum in 1. Other isolated findings were seen in 3 patients (2%), including one case each of Mallory-Weiss tear, pyloric stenosis, and a Peutz-Jeghers polyp.

**Table 3:** Endoscopic Findings

Endoscopy Findings	Number (n)	Percentage (%)
<b>Normal Study</b>	65	43.33%
<b>PHTN, Esophageal varices</b>	20	13.33%
• Low grade	14	
• High grade	6	
<b>Strictures</b>	20	13.33%
• Esophageal Strictures	17	
• Post TEF repair	9	
• Post corrosive	7	
• Unknown etiology	2	
• Gastric strictures	3	
<b>Corrosive injury</b>	17	11.33%
• Low Grade (2a and below)	7	
• High Grade (2b and above)	10	
<b>Gastritis/Duodenitis</b>	14	9.33%
<b>Foreign Body (FB) Removal Done</b>	11	7.33%
• Esophagus	4	
• Stomach	6	
• Duodenum	1	
<b>Other Isolated Findings</b>	3	2%
• Mallory-Weiss tear	1	
• Pyloric stenosis	1	
• Peutz-Jeghers polyps	1	



**Figure 1:** Esophageal Varices

#### 5. Discussion

This study presents a comprehensive overview of paediatric upper gastrointestinal endoscopy (UGIE) practice in a tertiary care setting, with an emphasis on indications, findings, and the predictive potential of demographic variables.

The most common presenting complaint was hematemesis, observed in 36 patients (24%), aligning closely with the most frequent indication for UGIE—upper gastrointestinal bleeding, also seen in 36 patients (24%). Other commonly reported symptoms included abdominal pain and corrosive ingestion, each in 26 patients (17.3%), and dysphagia in 20 patients (13.3%). These symptoms were strongly associated with significant endoscopic findings such as strictures and corrosive injuries, indicating that UGIE was largely performed in patients presenting with acute or high-risk gastrointestinal concerns. The clear alignment between presenting complaints and procedural indications reflects appropriate clinical triaging.

Comorbidities were documented in 71 patients (47.3%), with the most notable contributors being acid ingestion in 13 patients (8.7%), alkali ingestion in 6 patients (4%), post-tracheoesophageal fistula (TEF) repair status in 10 patients (6.7%), and extrahepatic portal vein obstruction (EHPVO) post-variceal ligation in 4 patients (2.7%). These findings highlight the complexity of cases managed, particularly those involving post-surgical sequelae or toxic ingestion, and underscore the need for multidisciplinary care.

Endoscopic evaluation revealed a normal study in 65 patients (43.3%), suggesting that a notable proportion underwent UGIE for functional or non-structural symptoms such as dyspepsia or reflux. Abnormal findings were identified in 85 patients (56.7%). Esophageal varices, primarily due to portal hypertension, were observed in 20 patients (13.3%), with low-grade varices present in 14 patients and high-grade in 6 patients. These findings reflect underlying chronic liver disease, often in its early stages.

Esophageal and gastric strictures were also seen in 20 patients (13.3%), with esophageal involvement in 17 patients. Among these, 9 patients had strictures secondary to TEF repair, and 7 patients had strictures following corrosive ingestion, underscoring the burden of both congenital and acquired conditions. Corrosive injuries were documented in 17 patients (11.3%), with high-grade lesions ( $\geq 2b$ ) noted in 10 patients

and low-grade lesions ( $\leq 2a$ ) in 7, indicating either severe exposure or delayed presentation to healthcare facilities. These children are at considerable risk for long-term complications such as feeding difficulties and recurrent strictures.

Foreign body (FB) removal was performed in 11 patients (7.3%), most commonly from the stomach (6 cases), followed by the esophagus (4 cases) and duodenum (1 case). These cases likely involved younger children or those with developmental or behavioural vulnerabilities. Gastritis or duodenitis was identified in 14 patients (9.3%).

In few patients, isolated but clinically significant findings were also recorded, including Mallory-Weiss tear, pyloric stenosis, and a Peutz-Jeghers polyp- each detected in 1 patient (0.7%)- highlighting the broad spectrum of pathologies encountered during paediatric UGIE.

Importantly, no major intra- or post-procedural complications were observed, confirming that UGIE is a safe and well-tolerated procedure when performed by trained personnel in a controlled environment. Minor events such as cough or gagging occurred but were self-limiting and managed conservatively.

## 6. Conclusion

UGIE is a valuable diagnostic and therapeutic tool in children with GI symptoms, particularly in high-risk cases such as GI bleeding, corrosive ingestion, and post-surgical complications. While a significant proportion of studies were normal, the high rate of clinically relevant findings supports its continued use with high therapeutic potential and to plan future course in patients with varices and polyps. The procedure is safe, with no significant complications. Moving forward, improved preventive strategies, early referrals, and comprehensive post-surgical surveillance will be key to optimizing outcomes in children requiring upper GI endoscopy.

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