

When to do paediatric gastrointestinal endoscopy?

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Abstract

Over the last few decades, paediatric gastroenterology has rapidly developed into a well-established sub-specialty. Improvements in training and equipment have led to enhanced safety with fewer complications following endoscopies. In specialized units, diagnostic and therapeutic upper gastrointestinal endoscopy and proctosigmoidoscopy/colonoscopy are regularly performed under conscious sedation or general anaesthesia. Emerging guidelines and new advances in the diagnostic tools are being incorporated into routine paediatric gastrointestinal endoscopy practice.

Keywords children; colonoscopy; criteria; endoscopy; gastrointestinal tract

Introduction

The field of paediatric gastroenterology has evolved into a defined sub-specialty over the last few decades. The number of paediatric gastroenterologists has increased steadily worldwide. Over the recent years, dramatic improvements in the equipment including fibre optic and video technology, greater availability of dedicated sessions, nursing support, approved training curriculum and enhanced training opportunities have improved successful and safe execution of paediatric gastrointestinal (GI) endoscopy. GI endoscopy remains one facet of a thoughtful and judicious use of investigations undertaken by a clinician who is competent in making informed decisions while taking into consideration its benefits vs risks, safety aspects, patient/parent preference and availability of alternative investigation modality. Like any investigation requested, paediatric GI endoscopy is only useful when it is likely to influence management, resulting in an improved outcome. Worldwide, the decision to perform GI endoscopy may also be influenced by its availability, cost and necessary expertise.

Historical perspective

Since its inception in the 1960s, paediatric gastroenterology has rapidly established itself into a recognised sub-specialty. With

Abbreviations: GI, Gastrointestinal; OGD, Oesophagogastroduodenoscopy; UK, United Kingdom; PEG, Percutaneous Endoscopic Gastrostomy; EO, Eosinophilic Oesophagitis; PPI, Proton Pump Inhibitor; GORD, Gastro-Oesophageal Reflux Disease; HP, Helicobacter Pylori; ESPGHAN, European Society of Paediatric Gastroenterology Hepatology and Nutrition; BSPGHAN, British Society of Paediatric Gastroenterology Hepatology and Nutrition; EMA, Endomysial Antibody; IBD, Inflammatory Bowel Disease; UC, Ulcerative Colitis; FAP, Familial Adenomatous Polyposis; PJS, Peutz-Jeghers Syndrome; APC, Adenomatous Polyposis Coli.

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the development of a sub-specialty focused on disorders of the paediatric GI tract, new technologies such as paediatric endoscopy were developed to aid diagnoses. Paediatric oesophago-gastroduodenoscopy (OGD) began in the 1970s and since that time, it has evolved from an infrequent procedure in the operating room with a single ocular operator view for macroscopic inspection of the GI-tract to a routine day case procedure. There is a structured grid training programme for prospective trainees in the United Kingdom (UK) that has emerged from earlier training of paediatricians in adult gastroenterology units and an increased recognition of GI disorders that are unique to children. Endoscopists these days also enjoy macroscopic views using large high definition viewing screens with the option of video recording and obtaining still pictures.

GI endoscopy

The most frequently performed GI endoscopies in children are diagnostic OGD and proctosigmoidoscopy/colonoscopy. Other diagnostic and therapeutic interventions include endoscopic retrograde cholangiopancreatography, dilatation of oesophageal strictures, vascular ligation or sclerotherapy for bleeding varices, foreign body retrieval, insertion of percutaneous endoscopic gastrostomy (PEG) and polypectomy. Moreover, new disorders such as Eosinophilic Oesophagitis (EO) have been established as well-known entity.

New and emerging modalities like video capsule endoscopy, balloon assisted enteroscopy and narrow band imaging are being established in paediatric GI practice and may be incorporated into routine diagnostics in the future. Despite an increase in the number of GI endoscopies over the years, diagnostic yield with abnormal histology results remains constant at 62–67%. This suggests that the increase in number of paediatric endoscopies performed is due to increased demand rather than lower threshold for the procedure. Small number of negative/normal endoscopies is important to ensure satisfactory pick up rate of all significant pathologies. Normal endoscopy may also influence management decisions by reassuring patient/parents as well as clinicians.

Patient preparation and consent

Preparation for gastrointestinal endoscopy involves providing adequate verbal and written information to parents/child. It is crucial to provide sufficient information (e.g. potential risks and benefits of the procedure using an age-appropriate language) in good time before the actual date of procedure. Physiological, psychosocial and emotional needs of paediatric patients and their parents should be taken into consideration. Prior to elective procedure, informed consent from parents or guardians should be obtained. It is equally important to document key elements of this consultation in patient notes.

Risks/complications of GI endoscopy

Rare risks of GI endoscopy include bleeding, infection and perforation. Bleeding after colonoscopy is usually minimal and self limited (may occur after mucosal biopsy or polypectomy). Depending on the case series, bleeding has been documented to occur in 0.26%–2.5% of patients after colonoscopy. Colonic

perforation is the most serious complication of colonoscopy in children and is either during polypectomy or related to forceful insertion of colonoscope while negotiating acute bends (especially in a child with macroscopic evidence of moderate/severe colitis). Its risk ranges from 0.06% to 0.3%. Risk of bacteraemia is quite rare even after polypectomy and multiple biopsies.

Pre-procedural assessment

Pre-procedural assessment includes a thorough evaluation including history of previous sedation/anaesthesia, medication and allergies. Focussed physical examination involves special focus on the airway/breathing system. It is important to examine and document any relevant findings such as loose teeth, oral piercings and enlarged tonsils. Loose teeth can be accidentally dislodged when entering the airway. Significantly enlarged tonsils and adenoid hypertrophy can result in breathing difficulties and obstructive apnoea in sedated patients.

Laboratory tests may include coagulation screening and full blood count (especially prior to therapeutic endoscopies). However, in the absence of significant past medical history, the significance of pre-endoscopic routine blood tests such as coagulation screening is limited. It is natural for young children and teenage youngsters to be anxious prior to the procedure. Presence of parents during pre-procedural preparation and use of premedication with benzodiazepines has been shown to reduce anxiety and fear prior to the procedure. Midazolam has also been shown to reduce the emotional stress and makes the patient feel more comfortable during intervention.

Advice on dietary restrictions and bowel preparation

Pre-procedural fasting and bowel preparation depends on patient's age, type of sedation or general anaesthesia and the planned procedure (e.g. OGD or colonoscopy). Agents used for sedation have the potential to impair protective airway reflexes, particularly during deep sedation. Although a rare occurrence, pulmonary aspiration may occur if the child regurgitates during sedation due to inability to protect his or her airway. Usual recommendation is to fast from solids/formula feeds for 6 hours, breast milk for 4 hours and clear fluids (e.g. water) for 2 hours before the procedure. However, one should follow local guidelines and policies.

Since there is no ideal bowel cleansing regimen in children, various protocols have been developed and followed in different institutions. There is no consensus on the use of an ideal pharmacological preparation for bowel cleansing prior to colonoscopy. Polyethylene glycol based solutions with electrolytes or stimulant laxatives are used in various combinations to achieve desirable results. In infants, adequate preparation can usually be obtained with cautious use of small-volume enemas.

Sedation vs general anaesthesia

OGD and colonoscopy in children are generally performed either under moderate (conscious) sedation or general anaesthesia. This largely depends upon local facilities and arrangements. Advantages of conscious sedation include maintaining protective airway reflex, spontaneous breathing during the procedure and quick recovery afterwards. Sedation in children is often

administered to control behaviour to allow safe completion of endoscopic procedure. During conscious sedation, there remains a risk of aspiration and occasional patients may progress to deep sedation with respiratory depression, hypoventilation, apnoea, airway obstruction, laryngospasm, and cardiopulmonary impairment. Some of the patients given midazolam may develop paradoxical excitement and aggression during the procedure.

It is recommended that all patients having conscious sedation during GI endoscopy should be monitored by an appropriately skilled professional (other than endoscopist/operator) who is competent in monitoring and maintaining the airway in case of airway compromise. General anaesthesia, on the other hand, provides a more conducive environment for the endoscopist and a well protected airway. It also provides a pain/distress free experience for the patient.

Upper GI endoscopy

An upper GI endoscopy is the most useful resource for evaluating oesophageal, gastric and duodenal pathology. Majority of the OGDs are performed for diagnostic purposes. The endoscopist is able to perform macroscopic evaluation of upper GI mucosa up to and including 2nd part of duodenum in all the cases. During OGD, biopsies are usually taken from various parts of upper GI tract for histological evaluation. Insertion beyond 2nd part of duodenum is also achievable in some patients.

Diagnostic OGD

Diagnostic OGD is the standard method of detecting and diagnosing many GI disorders. The threshold for examination varies with personal practice and ease of availability. Table 1 outlines common diagnostic indications for OGD in infants/children. One of the most frequent indication for OGD has been to confirm the diagnosis of coeliac disease. Other indications include upper abdominal pain and/or discomfort (mostly epigastric) with red flags in history or on examination (e.g. weight loss, anorexia, anaemia). In many instances, OGD is undertaken for epigastric/retrosternal pain or discomfort which persists despite a course of Proton Pump Inhibitor (PPI) therapy. Intermittent episodes of vomiting, complicated gastro-oesophageal reflux disease (GORD) and suspected symptomatic *Helicobacter Pylori* (HP) gastritis may also warrant an OGD. Disaccharidase enzyme evaluation (e.g. lactase test) may also be carried out during OGD.

Diagnostic paediatric OGD-indications

- Coeliac disease
- Vomiting/intractable or chronic GORD
- HP infection
- Chronic abdominal pain with significant morbidity or signs of organic disease
- Anorexia/weight loss/faltering growth
- Unexplained anaemia
- Crohn's disease/IBD
- Chronic diarrhoea/malabsorption
- Unexplained melaena

Table 1

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