The challenge of outpatient clinical triage in paediatric gastroenterology

Who is referred and what is needed?

Kathleen H McGrath, George Alex

Abstract

Demand for paediatric outpatient subspecialty clinics is increasing. Clinical triage has an important role in workflow and ensuring patients are seen in a timely manner, appropriate to their clinical need. Clinicians who triage referrals rely on provision of adequate clinical information and relevant investigations. Referrals to a paediatric gastroenterology outpatient service in a large tertiary hospital were audited prospectively to determine appropriateness of clinical information and investigations provided, and to identify gastrointestinal conditions where general practitioners may benefit from targeted education. To the authors' knowledge, this is the first study assessing challenges of clinical triage in Australian paediatric subspecialty outpatient services.

REFERRALS to public paediatric outpatient subspecialty clinics have increased substantially in the last decade.[1] General practitioners (GPs) provide primary healthcare in Australia and are the predominant referral source for paediatric subspecialty clinics.[2] Childhood gastrointestinal problems are common and likely to be encountered in primary healthcare. Concern has been raised that GP trainees may have limited exposure to a range of paediatric conditions, particularly chronic illness in children, which may have an impact on their practice, including their outpatient referral patterns.[3] Effective clinical triage of referrals relies on provision of adequate clinical information ('red flags') and investigations. Absent or irrelevant data can limit determination of acuity and time frame in which patients should be seen.

Our aim was to review referral patterns to a paediatric gastroenterology outpatient service, determine the appropriateness of clinical information and investigations provided, and identify conditions that may benefit from targeted clinician education programs.

Methods

We performed a prospective audit of all new gastroenterology outpatient referrals to a public paediatric tertiary referral hospital from October to November 2017 (n = 174). Additional data were collected for rectal bleeding referrals (October 2017 to January 2018) and assessed separately (n = 46). Referrals were included from all external community providers as well as internal referrals for patients not previously seen in the outpatient service.

The hospital's website encourages all referrals to be completed on a downloaded standardised form and returned by fax; however, freely written letters are accepted. Links are available on the website to pre-referral guidelines for some conditions and a list of demographic information required for a valid referral. All referrals received are scanned and entered into an individual patient electronic medical record (EMR) by administrative staff. The system automatically progresses referrals to a specific electronic 'In basket' if the referrer has nominated a specialty, or otherwise progresses to a nurse triage work queue for a specialty to be allocated. All referrals in the gastroenterology 'In basket' are clinically triaged by a consultant and senior fellow responsible for this task, following hospital and state government policy requirements.[4,5]

Clinical information was prospectively recorded from the scanned referral form or letter through the 'In basket' at the time of clinical triage, and included demographics of child referred (age, gender), referral source (GP or non-GP), primary reason for referral, clinical information and investigations. Data were summarised

using descriptive statistics. The study received approval from the hospital's human research ethics committee (HREC 37306A).

Results

A total of 174 new patients were referred (53% female, 47% male), predominantly primary school age. The largest referral group was GPs (49%). Top referral reasons from GPs included abdominal pain, rectal bleeding, diarrhoea and *Helicobacter pylori* (Table 1). Most non-GP referrals came from general paediatricians.

Investigations were attached to 50% of referrals (71% of GP referrals). As expected, investigation rate differed by referral problem (Table 1). Not all included investigations were relevant (eg two suspected coeliac disease referrals were for positive HLA-DQ2 and HLA-DQ8 alone) and included investigations were not always aligned with current guidelines recommendations (eg serology testing for *H. pylori*).

Approximately one-third of rectal bleeding referrals included investigations (37%; 17/46). Investigation type varied between stool microscopy/culture (11/17), stool calprotectin (2/17), haemoglobin (5/17) and iron studies (3/17). Relevant clinical information recorded in referrals included bleeding duration (6/46), weight loss (3/46), abdominal pain (15/46), diarrhoea (11/46), constipation (15/46) and family history (4/46).

Discussion

We showed a large number of referrals to paediatric gastroenterology outpatient services, with abdominal pain the most common referral reason overall, predominantly from GPs. Constipation referrals were uncommon despite being a common paediatric problem. This reflects a previously successful project at the hospital to improve workflow and streamline constipation referrals, except for complex or refractory cases, to general paediatric services.

Distribution of those referrals containing investigations were generally appropriate for the referral reason (eg high rate of appropriate investigation inclusion for suspected coeliac disease, and low rate of appropriate investigation inclusion for gastro-oesophageal reflux disease), with the exception of rectal bleeding referrals. Referrals for rectal bleeding had a surprisingly low level of investigations. This was mirrored by a lack of relevant clinical information. Differentials range from serious conditions (inflammatory bowel disease) requiring early assessment to non-urgent causes (anal fissures secondary to constipation). Inclusion of 'red flags' is important to determine acuity and timing of initial assessment (Table 2). Objective parameters such as stool microscopy/culture (assessing for colitis or infection) and haemoglobin level (assessing for anaemia) may be important when there are concerns a child is unwell or requires early review. The lack of information provided is concerning for poor understanding of this symptom in children.

Despite overall high rates of investigation inclusion by GPs, we identified a high variability in the type and appropriateness of investigations performed, the clinical information included and whether relevant 'red flags' were addressed. In addition, investigations were not always aligned with recommended practice – for example, two patients were referred for

Table 1. Primary reasons for referral to a paediatric gastroenterology outpatient clinic, showing demographics of patient referred, referral source and number of referrals, including investigations with referral

Primary referral reason	Age of patients referred, mean (range) [years]	Referral source general practitioners, n (%)	Referrals with investigations attached, n (%)
Total (n = 174)	**8.7 (0–19)**	**85 (49)**	**87 (50)**
Abdominal pain (n = 28)	10.7 (4–17)	23 (82)	21 (75)
Gastrostomy (n = 24)*	8.1 (1–18)	1 (4)	0 (0)
Suspected coeliac disease (n = 22)	8.4 (2–17)	9 (41)	22 (100)
Rectal bleeding (n = 19)	8.2 (1–17)	11 (58)	6 (32)
Gastro-oesophageal reflux (n = 16)	10.6 (0–17)	8 (50)	3 (19)
Diarrhoea (n = 12)	9.3 (0–19)	10 (83)	9 (75)
Helicobacter pylori (n = 11)	8 (3–13)	10 (91)	10 (91)
Vomiting (n = 8)	10.1 (1–18)	4 (50)	3 (38)
Abnormal liver function test (n = 6)	8.3 (0–16)	4 (67)	6 (100)
Constipation (n = 5)	7.2 (2–16)	2 (40)	0 (0)
Other/miscellaneous (n = 23)†	6.4 (0–17)	3 (13)	7 (30)

**n = 5 referrals for initial percutaneous endoscopic gastrostomy insertion, remainder for gastrostomy care*
†Included: cystic fibrosis–related gastrointestinal disease, dysphagia, failure to thrive, feeding problems, food allergy

Table 2. Recommended clinical red flags (history, examination) for inclusion in paediatric gastroenterology outpatient clinic referrals to assist with accurate clinical triage: Suggested first-line investigations to be considered (include result if performed)[6–9]

Primary referral reason	Clinical red flags		Suggested first-line investigations to consider	Pre-referral treatment
	History	Examination		
Rectal bleeding	Duration of bleeding Appearance of blood Weight loss or growth concerns Abdominal pain Stool frequency and consistency (diarrhoea, constipation) Fevers or loss of energy, appetite Family history	Pallor Rashes, birth marks, bruising or vascular lesions Aphthous ulcers Abnormal vital signs Current weight Abdominal examination Perianal inspection	First-line investigations should be considered in all unwell children: • stool microscopy/culture (MCS) • full blood examination (FBE) • iron studies • erythrocyte sedimentation rate (ESR)	If not due to acute infection settling within a week, refer If child is clinically well with no red flags and history/examination strongly suggestive of constipation and anal fissure, a trial of aperient may be considered. Refer if symptoms persist
Abdominal pain	Bilious or bloody vomiting Abdominal distension Stool frequency and consistency Weight loss or growth concerns Rectal bleeding Fever or loss of energy, appetite Family history Psychological stressors School attendance	Pallor Abnormal vital signs Current weight and height Abdominal examination including inguinal region Perianal inspection	For chronic or recurrent abdominal pain (depending on presentation/red flags), consider: • urinalysis • stool MCS, including parasites • FBE • liver function tests (LFT) • ESR	Consider need for emergency/surgical involvement and/or clinical discussion with relevant specialist in any child with acute abdominal pain
Diarrhoea	Weight loss or growth concerns Diarrhoea frequency, consistency, volume Nocturnal diarrhoea Abdominal pain Rectal bleeding Nausea or vomiting Loss of energy or appetite Diet and travel Family history	Pallor Rashes or skin changes Aphthous ulcers Current weight Abdominal examination Perianal inspection	For chronic diarrhoea consider: • stool MCS, including parasites • stool fat/fatty acid crystals • FBE • LFT • ESR • coeliac serology, total immunoglobulin A (IgA)	Consider osmotic diarrhoea (high fruit juice or sugar intake) and lactose intolerance All children who have diarrhoea associated with rectal bleeding or growth concerns should be referred
Helicobacter pylori	Recurrent epigastric pain Haematemesis or malaena Loss of appetite, early satiety or nausea History of peptic ulcer disease Risk factors (eg family member with *H. pylori* infection, peptic ulcer disease or gastric cancer)	Pallor Current weight and height Abdominal examination	*H. pylori* antibody tests (serum, urine, saliva) are not recommended (variable sensitivity/specificity; immunoglobulin G (IgG) may remain positive long after eradication therapy) *H. pylori* stool antigen/urea breath test: used to assess outcome post-eradication therapy. May support referral for endoscopy in children with symptoms or risk factors where other causes are excluded	Non-invasive *H. pylori* testing is not indicated for recurrent abdominal pain. Assess for other possible causes Diagnosis of *H. pylori* infection requires positive culture or specific gastritis on histopathology with at least one other positive biopsy-based test
Suspected coeliac disease	Weight loss or growth concerns Abdominal pain or distension Stool frequency and consistency Nausea or vomiting Loss of energy or appetite Risk factors (eg family history coeliac disease; personal/family history of type 1 diabetes; autoimmune thyroid disease)	Pallor Rashes Aphthous stomatitis Current weight and height Pubertal delay Abdominal examination	Coeliac serology (on gluten-containing diet) and serum total IgA: • tissue transglutaminase (TTG) IgA • endomysial antibody (EMA) IgA (not widely available) • deamidated gliadin peptide (DGP) IgG (useful in IgA deficiency or children aged <2 years) • genetic testing (HLA-DQ2/HLA-DQ8) has very low positive predictive value	Patients should remain on a gluten-containing diet until endoscopy is performed to facilitate accurate and timely diagnosis. Diagnostic gold standard is characteristic mucosal changes on duodenal biopsy

positive HLA-DQ2 and HLA-DQ8 alone with no coeliac serology or dietary history. Approximately 1 in 30 people who have HLA-DQ2 or HLA-DQ8 will develop coeliac disease,[6] and a positive gene test alone is not an appropriate referral. Genetic testing may be used as an adjunct test in conjunction with the more important coeliac serology (while on gluten) and clinical symptoms.[6,7] A negative result for both HLA-DQ2 and HLA-DQ8 can be useful for excluding coeliac disease.[6,7]

Effective clinical triage has implications for patient safety and appropriate use of outpatient and clinician resources. Pre-referral guidelines may assist decisions about appropriateness and timing of referral, information to be included and pre-referral treatment. Table 2 outlines recommendations for clinical red flags to include in paediatric gastroenterology outpatient referrals. Suggested first-line investigations are included but do not form an exhaustive list and may differ depending on individual presentation.

Conclusion

There was a high variability and not uncommonly inadequate provision of clinical information and investigations performed, at the point of referral, to enable effective triaging. This article provides a practical summary of relevant clinical information and investigations for common paediatric gastrointestinal problems to assist assessment and appropriate referral by clinicians.

Authors

Kathleen H McGrath FRACP, MBBS, BSc (Med), Consultant Gastroenterologist, Department of Gastroenterology and Clinical Nutrition, Royal Children's Hospital, Melbourne, Vic. mcgrath.kathleen@gmail.com

George Alex PhD, FRACP, MRCP, MMed, MBBS, Consultant Gastroenterologist, Department of Gastroenterology and Clinical Nutrition, Royal Children's Hospital, Melbourne, Vic

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correspondence **ajgp@racgp.org.au**