Recurrent abdominal pain among children

Reviewed by:

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Introduction[1]

- RAP is very commonly observed in the pediatric population affecting around 10%-20% of school-going children. The term "recurrent abdominal pain" should not be used as a diagnosis; it is encompassed in the term "chronic abdominal pain" and is a heterogeneous disorder. Recurrent abdominal pain was defined by four criteria:
  1) ≥3 episodes of abdominal pain
  2) Pain sufficiently severe to affect activities
  3) Episodes occur for ≥3 months
  4) No known organic cause
- Recurrent abdominal pain of childhood encompasses both organic and functional etiologies though functional causes are common organic causes need to be excluded.
- Functional disorders – Functional disorders are conditions in which the patient has variable combinations of symptoms without any readily identifiable or strong suspicion of a distinctly organic condition. Functional disorders are now referred to as "disorders of gut-brain interaction" to emphasize the interplay between the enteric & central nervous systems and gastrointestinal and psychosocial factors contribute to symptoms. These disorders may be associated with visceral hyperalgesia (reduced threshold for pain), abnormal pain referral after rectal distension, or impaired gastric relaxation response to meals.
- These disorders are categorized into four subtypes
  1) Functional dyspepsia
  2) Irritable bowel syndrome (IBS)
  3) Abdominal migraine
  4) Functional abdominal pain not otherwise specified

Functional constipation is grouped separately as a functional defecation disorder but is a consideration when evaluating symptoms of chronic abdominal pain. Constipation can be both organic or functional in nature.

Organic causes include

Helicobacter pylori infection

- Most of the children affected by RAP with associated *H. pylori* do not feel better from eradication of the infection, as the pain persists even after successful treatment.

Eosinophilic oesophagitis and reflux oesophagitis

- Oesophagitis is a well-established cause of epigastric pain in children whereas GERD is common in young infants.
- In recent years, eosinophilic oesophagitis (EE) has been reported with increasing cases in Western as well as in developing countries. Allergy is considered to be the causative agent of EE.

Carbohydrate intolerance

- In Asia, carbohydrate intolerance is a common cause of RAP wherein the most common carbohydrate is lactose, found in mammalian milk. Another carbohydrate that might cause RAP is sorbitol, a food additive.
- Celiac Disease—Presents with recurrent abdominal pain, weight loss, frequent stools, iron deficiency anemia.

Abdominal migraine

- RAP can be a manifestation of migraine in children. A family history and the abdominal pain is correlated with nausea or vomiting. Headache may or may not be present.

Inflammatory bowel disease

- Chronic inflammatory bowel disease (IBD) is often suspected in children with RAP which is associated with vague abdominal pain.

- Due to a clean and developed industrialised environment, the lack of common infections and parasites in the intestinal tracts might be responsible for the development of IBD.

Dysmenorrhea—Recurrent cyclical abdominal pain associated with menstruation

Parasitic infections—e.g., Giardia—Diarrhea, crampy abdominal pain, and bloating can be the presenting features.

Surgical conditions

- Many surgical conditions can present as RAP such as recurrent intussusceptions, Meckel diverticulitis, intestinal malrotation, choledochal cyst and intestinal lymphoma. Meckel diverticulum is a common intestinal malformation that is present in 2% of the population and it can present in numerous ways such as RAP.
- Intestinal lymphoma is one of the most common causes of RAP in children. One should suspect this condition if the child with RAP has poor food intake and weight loss.

Red flag signs[1]

Red flag symptoms of RAP

- Localisation of pain away from the central abdominal region
- Pain correlated with changes in bowel habit (Diarrhea, constipation or nocturnal bowel movements)
- Pain correlated with night-waking
- Recurrent unexplained fever, loss of appetite and energy
- RAP in very young children (< 4 years)
- Weight loss or poor growth
- Recurrent bloody stools
- Unexplained pallor

Red flag signs of RAP

- Weight loss or decline in height velocity
- Pallor/jaundice
- Organomegaly or palpable mass in the abdomen
- Localized tenderness away from the umbilical region
- Perianal abnormalities
- Joint swelling, redness or warmth, finger clubbing
- Ventral hernia of the abdominal wall.

Evaluation of RAP[2]

Investigations in RAP

First line investigations

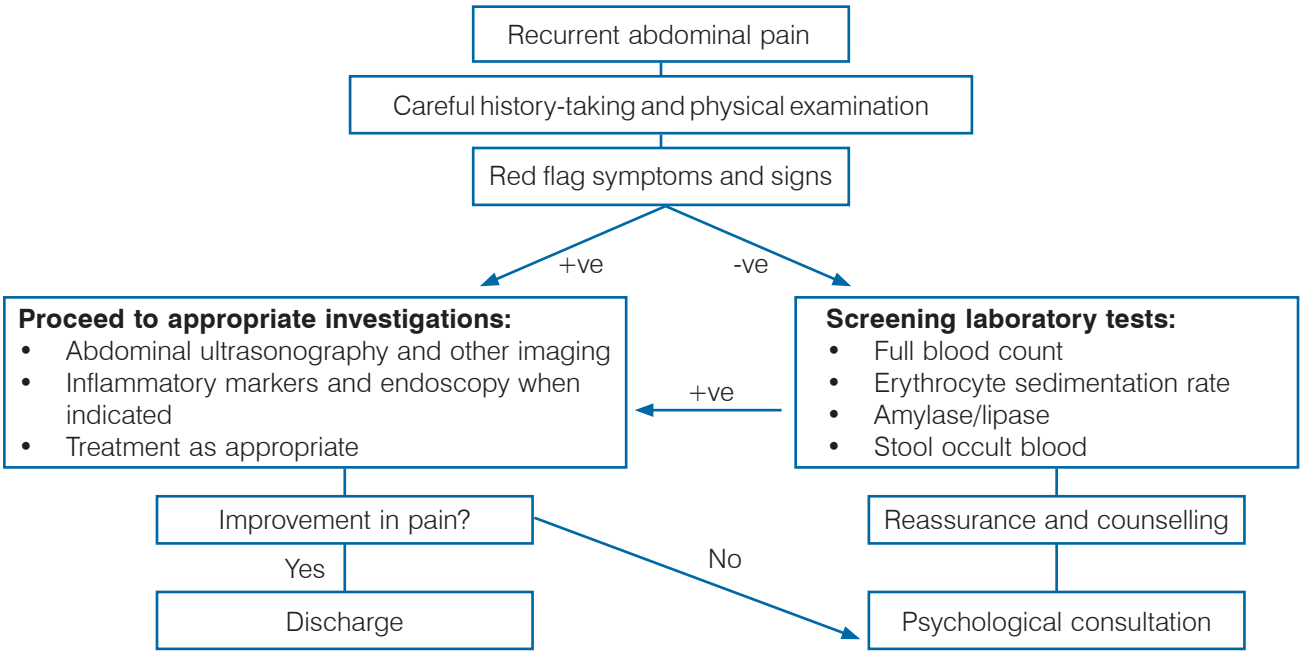
- Full blood count
- Erythrocyte Sedimentation Rate/ C-reactive protein
- Urine analysis
- Urine culture
- Stool for ova, cysts and parasites

Second line investigations

- Plain X-ray abdomen
- Liver Function Test & Renal Function Test
- Abdominal ultrasound
- Breath hydrogen test for lactose intolerance
- Tests for *Helicobacter pylori*
- Barium follow through
- Esophageal manometry and pH-metry
- Upper and lower gastrointestinal endoscopy
- Intravenous urogram/micturition cystourethrogram.

History	Physical signs
• Age < 5 years • Symptoms of fever, joint symptoms, recurrent oral ulcers, unexplained rash • Involuntary weight loss • Chronic diarrhea • Blood in stools (Gross or occult) • Dysphagia • Vomiting, especially if bile- or blood-stained • Nocturnal symptoms • Persistent right-sided pain • Referred pain to the back or shoulders • Dysuria, haematuria or flank pain • Family history of gastrointestinal disease	• Growth deceleration, delayed puberty • Jaundice, pallor • Clubbing • Acute abdomen (rebound, guarding) • Organomegaly • Perianal disease (Tags, fissures, fistulas).

Algorithm for children with RAP[1]



Guidelines for Management of RAP[2]

- **Explanation and reassurance—**Carefully explain to the family and the child about the concepts and reasoning behind all investigations. After identifying the organic cause, reassure the patient and family that no major illness is present.
- **Identification of red flags—**Make sure that the parents understand the objective changes and provide guidelines for what to do if they observe those red flags.
- **Avoid psychological "labelling"—**Do not suggest that the child's pain is psychological or that the child might be malingering.
- **Allow normal activity—**Encourage normal activity between times of pain.

- **Look out for withdrawal—**If the child begins to withdraw from normal activity, psychological referral should be considered for pain management.
- **Establish regular follow-up—**Regular follow-ups to monitor the symptoms.
- **Be available—**Assure that you are available to see the child if changes are observed or the parents become anxious.
- **Beware the placebo response—**Avoid making an immediate diagnosis according to the therapeutic response. Placebo effects, particularly those involving the GI tract, can be misleading.
- **Make judicious use of "second opinions"—**Be open to requests for second opinions, assure the parents that you will continue to help manage their child's problem even after a second opinion is considered.

A practical approach to RAP without alarm symptoms and signs

Reassurance and setting of realistic goals[3]

- Reassure the child and family that chronic abdominal pain is a common symptom in children and few have an underlying disease. Realistic treatment goals should be set, with the principal objective being the return to normal function rather than a complete resolution of the symptoms.

Abdominal pain diary[3]

- Maintain a symptom diary by recording any triggering factors, duration of pain and accompanying symptoms like vomiting and altered bowel habits symptoms.

Pharmacotherapy[3]

- Commonly used agents comprise acid-suppressing drugs (histamine receptor antagonists, proton pump inhibitors), antispasmodic drugs (trimebutine), analgesics and probiotics.

Psychological therapy[3]

- Psychological intervention might have a role in difficult cases, where there is a complex interaction between the child's psychosocial background and abdominal symptoms.
- CBT can modify thoughts, beliefs and behavioral responses to symptoms and has been shown to improve pain and disability outcomes.
- Relaxation training can attenuate the physiologic effects of stress and anxiety, hence relieving GI symptoms in patients with RAP.

Dietary modifications[2]

- A trial reported significant benefits for children with fibre supplementation. There was at least a 50% reduction in pain episodes as compared to 27% in the placebo group.
- Lactose malabsorption is observed in children with RAP. A trial conducted for 4 weeks reported significant or total pain relief after a lactose-elimination diet.

Role of Antispasmodics in RAP[4]

- **Antispasmodics—**A single two-week randomized double-blind placebo-controlled study (n-42) reported that the use of enteric-coated peppermint oil capsules in children with IBD reported that 71% of patients experienced a reduction in abdominal pain severity compared to 43% of controls.

Management of RAP with drotaverine

Drotaverine is a selective inhibitor of phosphodiesterase isoenzyme IV which is an effective antispasmodic, intestinal smooth muscle relaxant, without any anticholinergic side effects.[5]

Drotaverine might be useful for pediatrician to confidently prescribe this drug in children whenever required.[5]

Drotaverine hydrochloride for RAP management[6]

A randomized, double-blind, placebo-controlled study was conducted to examine the efficacy and safety of drotaverine in children with RAP for 12 months.

Children aged 4-12 years with RAP

RAP, defined as at least 3 episodes of pain interfering with normal activities within 3 months

Primary Endpoint

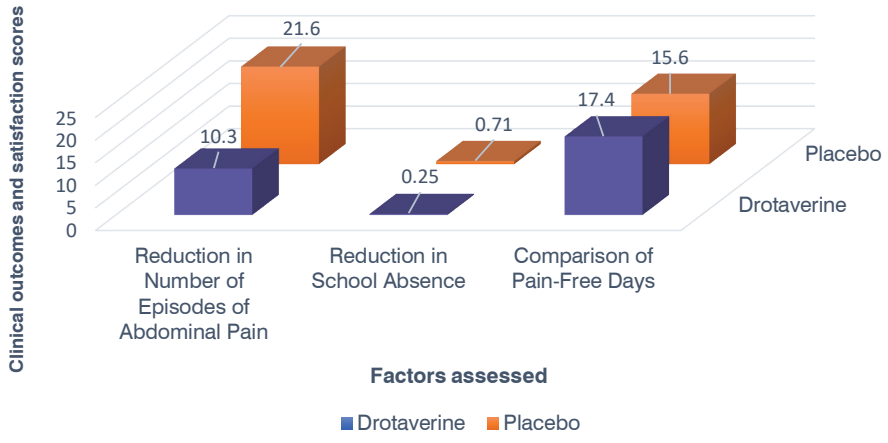
Number of episodes of pain during 4 weeks of use of drug and number of pain-free days.

Secondary Endpoint

Number of school days missed during the study period, parental satisfaction (Likert scale) and occurrence of adverse effects.

As shown in Fig 1: significant reduction in episodes of abdominal pain and frequency of missing school days in children receiving drotaverine therapy.
Drotaverine relieved abdominal pain due to its antispasmodic properties, which are devoid of anticholinergic activity.
Drotaverine was effective and safe for the management of RAP in childhood and it provided symptomatic

Figure 1: Impact of drotaverine on abdominal pain, school absence and pain free days in children



Drotaverine hydrochloride is effective and safe for managing recurrent abdominal pain in children. The treatment significantly reduced pain episodes and school absences compared to placebo, with improved parental satisfaction. The safety profile was comparable between both groups, making drotaverine a viable option for pediatric use.

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