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Review Article

Recurrent abdominal pain in children: a review

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ABSTRACT

Recurrent tummy (abdominal) pain (RAP) is among the most prevalent symptoms where children experience frequent stomach pain over an extended period. RAP is prevalent in children, affecting 10-20% of school aged children. There is no consensus regarding this widespread issue's genesis, investigation, and management. This review touches on a few concerns about children's recurrent abdominal pain.

Keywords: Children, Recurrent abdominal pain, Symptoms, Etiology, Management

INTRODUCTION

Recurrent tummy (abdominal) pain (RAP) is among the most prevalent symptoms where children experience frequent bouts of stomach pain over an extended period. Often, pain is acute and can be caused by various GI/ extraintestinal causes. Such acute abdominal pain usually does not result in unfavorable long-term consequences when appropriately treated. However, managing children with abdominal pain presents variety of challenges. First, history of pain in young children is frequently "second-hand" since it is parent's/ caregiver's perception of child's response to abdominal discomfort. Despite this obstacle, most parents can provide valuable leads on cause of stomach discomfort in their kids. Moreover, doing abdominal examination on young children with stomach pain might be difficult.

RAP is a prevalent painful health problem in children, affecting 10-20% of school-aged children.[1] The incidence has been comparable in Asian epidemiological studies. According to a survey by Boey and his colleagues, 10.2% of Malaysian school aged children have RAP (rural 12.4%, urban 8.2-9.6%).[10-11] According to Rasul and Khan, RAP was discovered in 11.5% of Bangladeshi school aged children.[12] In Sri Lanka, 10.5% of people have RAP.[13] Most studies often affect girls more than boys.[10-13]

Children who have stomach aches repeatedly are frequently nervous/despondent (depressed). In middle of 20th century, Apley et al who first described RAP in children, reported that most cases lacked organic causes and that etiology of RAP thought to be psychogenic in origin.[2] Abdominal pain in young children is usually difficult to localize, and patients frequently report discomfort in the middle of the belly. Degree and frequency of pain have no bearing on etiology.[2]

With breakthroughs in medical technology and more excellent knowledge of pathophysiology of stomach pain, more organic causes have been uncovered. *H. pylori* infection, eosinophilic oesophagitis and reflux oesophagitis, carbohydrate intolerance, abdominal migraine, inflammatory bowel disease, and surgical conditions well-established causes of RAP in children.[19]

RAP in children is known by several different names (Table 1). RAP, a term used to describe rather than diagnose pain, is known as at least 3 episodes of pain that last at least 3 months and interfere with a child's ability to engage in daily activities. RAP is typically seen as functional (nonorganic) abdominal pain, although in 5%

to 10% of instances, an organic cause is found. More and more organic causes have been discovered over time due to improvements in medical technology and understanding of pathophysiology of stomach pain. Yet, the most frequent reason for RAP in children is still functional in origin. This review touches on a few concerns about children's recurrent abdominal pain.

Table 1: Terms related to RAP in children.[9]

Terms	Definition
Recurrent abdominal pain	A minimum of three pain episodes that are severe enough to limit the child's ability to carry out daily activities during a minimum of 3 months.
Chronic abdominal pain	Pain that comes and goes and lasts for at least a month but usually more than 3 months.
Functional, nonorganic/ psychogenic abdominal pain	Abdominal pain that is not caused by tissue injury, inflammation, or anatomical abnormalities.
Nonspecific abdominal pain	Episodic stomach pain with aberrant physical findings and no obvious link to gastroenteritis.
Functional abdominal pain disorder (Rome IV criteria)	**Abdominal migraine:** Severe periumbilical, midline, or diffuse abdominal pain lasting longer than an hour and interfering with daily activities; at least 2 paroxysmal episodes over a period of six months; and pain accompanied by two or more additional symptoms.
	Functional abdominal pain: not otherwise specified: not fulfil criteria for pain with dyspepsia, irritable bowel syndrome, or abdominal migraine; occur at least 4 times per month for at least 2 months; involve episodic and persistent stomach pain unrelated to eating or menstruation.
	Functional dyspepsia: postprandial fullness, early satiety, epigastric discomfort, or burning that wasn't brought on by faeces occurring at least a few days each month for at least two months.
	Irritable bowel syndrome: abdominal pain that occurs at least 4 days a month for at least 2 months, is connected to bowel movements, changes in the frequency or consistency of faeces, and persists even after constipation in children.

LITERATURE REVIEW

For all relevant publications, a comprehensive literature search was conducted by utilizing web-based search engines, such as 'PubMed/Medline,' 'Scopus,' 'ScienceDirect' and 'Google Scholar' with the following keywords: "children", "recurrent abdominal pain", "symptoms", "etiology", "management." This systematic review covers about 19 articles that met the search criteria and were included in the study. Figure 1 shows the flow diagram for the method used for web search.

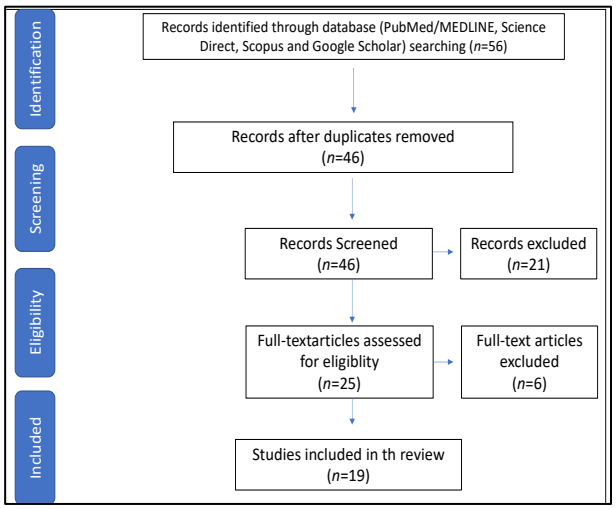

Figure 1: Method used for web search.

ETIOLOGY OF RAP

The following are typical causes of RAP in children:

Functional bowel disorder: The majority of youngsters with RAP don't have any obvious physical causes. A functional bowel disorder diagnosis will be established in this situation. It is referred to as functional bowel syndrome if other bodily parts are also affected.

Irritable bowel syndrome (IBS): Although IBS is typically more frequently noticed in adults, it may also afflict kids. In fact, US research found that approximately 1 in 7 teens and 1 in 16 youngsters aged 11 to 13 have symptoms similar to those of IBS. IBS in children is considered to have reasons that are similar to those in adults. The many components of the gut are believed to not function properly collectively, despite the fact that none of them alone are problematic. Additionally, the stomach's nerves or muscles might be hyperactive and the gut could be particularly sensitive to pain signals. If your kid experiences stomach discomfort that is relieved by using the restroom to poop, pain that is accompanied by a need for more frequent urination or by a different type of poop, or both, IBS may be the cause. If your kid experiences discomfort or pain in the abdomen and a change in bowel habits, IBS may be the cause.

Other IBS symptoms in kids may include diarrhoea (typically multiple times per day, sometimes

accompanied by a "rush" to go), constipation, and diarrhoea. A meal may trigger symptoms.

Functional dyspepsia: The Rome III criteria define functional dyspepsia as chronic or recurring pain or discomfort in the upper abdomen that is not eased by defecation or related to a change in stool frequency. Research in northern Italy reported a 0.3% incidence of functional dyspepsia among children aged 0 to 12, as defined by the previous Rome II criteria.[20] The primary cause of functional dyspepsia is impaired gastric motility, which results in delayed gastric emptying or short postprandial gastric relaxation.[21] Thus, after undergoing pressure-controlled volume filling of the stomach, children with functional dyspepsia report discomfort earlier than control participants.[22] In functional dyspepsia, delayed stomach emptying is associated with a higher symptom score.[13] Accelerated gastric emptying and prolonged stool transit time can also elicit upper abdominal pains and a bloated belly in children, culminating in the clinical picture of functional dyspepsia.[23] *Helicobacter pylori* infection is not connected with functional dyspepsia.

Abdominal migraine: In children, RAP may be a sign of a migraine. This is the cause for RAP in 1-2 out of every 10 kids. Similar attacks of severe abdominal pain that last an hour or more and are focused in the midsection are brought on by abdominal migraines. The youngster is entirely healthy for weeks or months in between bouts. Along with these symptoms, the youngster may also have headaches, nausea, vomiting, and light sensitivity. A family history of migraine affects many, but not all, children who suffer from abdominal migraine.

Constipation: As part of the irritable bowel syndrome symptom complex, constipation may have a role in RAP. Incomplete rectal evacuation is a significant factor. Lifestyle factors such as poor food, lack of fluid intake, and lack of exercise may be noteworthy.

Mesenteric adenitis: This is an inflammation or swelling of the sensitive and swollen lymph glands of the tummy. Children under the age of five are more prone to it than adults because they have bigger lymph glands in their stomachs, and viral infections are typically to blame. It normally goes away in two to three days, but it will come back along with other viral illnesses, which young children frequently contract.

Bladder (urinary tract) infections: UTI is prevalent in children. It can induce a variety of symptoms. By 16, one in every 30 males and one in every ten girls would have had at least one urinary infection.

Coeliac disease: this is the outcome of a gluten-related immunological response. In the USA and Northern Europe, it affects about one in 100 persons. It can result in persistent stomach pain that gets worse after consuming gluten-containing meals.

Lactose intolerance: A typical digestive issue occurs when the body has trouble breaking down lactose, a sugar mostly present in milk and (to a lesser extent) other dairy products. After consuming lactose-containing meals, symptoms often appear a few hours later. The following are some of them: wind, diarrhoea, bloating, belly ache, and feeling ill (nausea). Around 10% of white Europeans and 90% of South Asians, Africans, or South Americans have lactose intolerance, which develops with age and is more prevalent in older children and adults.[3]

Giardia infection: This digestive infection was once thought by specialists to be mostly acquired abroad, but we now know it can also be found in the UK. Among the symptoms include bloating, diarrhoea, wind, stomach discomfort, and feeling ill (nausea).

THE POTENTIAL CAUSES OF RAP

These comprise:

Inflammatory bowel disorders: Ulcerative colitis and Crohn's illness. Typically, these illnesses cause recurrent diarrhoea with blood or mucus in the faeces. During attacks, kids may get pretty ill. Any age might experience the disorders' onset, and they frequently run in families.

Kidney disorders: Including kidney stones.

Pains related to periods, such as ovulation and menstrual cramps.

Abdomen tumors: they are uncommon. Other typical symptoms include night sweats and weight loss.

Pancreas inflammation: Although pancreatitis in children is extremely rare, it can be brought on by injuries to the abdomen, some diseases, as well as some scorpion bites.

Stomach ulcers: These can happen to kids, especially if they've taken non-steroidal anti-inflammatory medicines. In most cases, eating makes the agony worse.

Sickle cell disease.

Swallowing of air (aerophagy).

Bezoar (a ball of swallowed material that gets stuck in the intestines). This is currently somewhat rare. One of the causes in the nineteenth century was chewing gum.

Spleen injuries: In particular, are possible during contact sports.

Lead poisoning: This is uncommon and results in a variety of hazy symptoms, such as nausea, vomiting, and stomach aches. Children's exposure to lead-based paint and paint dust in older buildings is most likely to blame.

Severe worm infestation: This is not common in industrialized nations, but it is particularly common in regions with roundworm infestations, such as Latin America, Africa, and Asia.

Tuberculosis: Although it is ubiquitous worldwide, it is rare in industrialized nations. In the UK, a cough is how it typically manifests.

Table 2: Causes of RAP.[8]

Area	Causes
Gastrointestinal	Chronic constipation
	Celiac disease
	Hepatitis
	Aerophagia
	Peptic ulcer
	Abdominal migraine
	Functional abdominal pain/syndrome
	Helicobacter pylori infection
	Gall bladder calculi
	Irritable bowel syndrome
	Inflammatory bowel disease, Parasitic infection (example: giardia, ameba)
	Functional dyspepsia
	Dietary intolerance (e.g. lactose)
	Chronic appendicitis
	Gastro-esophageal reflux disease
	Chronic pancreatitis
Urinary tract	Urinary tract infection
	Urinary calculi
	Pelvi-ureteric junction obstruction
Gynaecological	Pelvic inflammatory disease
	Endometriosis
	Ovarian cyst
Miscellaneous	Physical, emotional and sexual abuse
	Abdominal epilepsy

RAP NON-ABDOMINAL CAUSES

RAP may occasionally result from a physical issue beyond the stomach. This explains why your doctor would need to check a boy with RAP's testicles and groin, for example. RAP in the tummy may be referred from the ovaries or testicles, a hernia in the groin and the back joints.

RAP AFTER GASTROENTERITIS

There are times when it seems like bacterial gastroenteritis causes IBS. This might only indicate that the bowel is sore and taking its time to heal. Researchers are unsure of why some patients with gastroenteritis develop IBS while others do not. It is unclear if IBS brought on in this manner has an equal chance of persisting as IBS brought on by itself.

CLINICAL APPROACH

The most crucial steps to perform while treating a young kid with RAP are thorough clinical evaluation and diligent history-taking.

Extraintestinal aetiologies, including genitourinary reasons, should be ruled out in addition to looking for factors connected to the GI causes. Table 3 lists the familiar red flag symptoms and signs of RAP in children.

Table 3: "Red flags" in history and examination of RAP.[8]

"Red flags" on history	"Red flags" on physical examination
Localized pain away from the umbilicus	Weight loss or growth retardation
The child is awakened by pain at night	Organomegaly
Pain brought on by changes in bowel habits, rash, dysuria, or arthritis	Localized abdominal tenderness, especially away from the umbilicus
Occult bleeding	Joint swelling, tenderness or heat
Repeated vomiting	Abdominal wall hernias, pallor, rash
Constitutional symptoms such as persistent fever, appetite loss, and lethargic behaviour	-

Particular focus should be placed on ruling out the previously stated organic causes while conducting a physical examination. A variety of red flag signs suggests organic etiology. Some screening laboratory tests, such as urinalysis, stool for occult blood, and erythrocyte sedimentation rate (ESR), may be conducted when a thorough clinical history and physical examination cannot identify a particular etiology.

The kid and the parents should be comforted and counselled when no evident organic causes are identified. Psychological consultations are frequently required since the patient's quality of life their health may be impacted.[4,5] In other words, RAP is categorized as a functional GI condition and is deemed an available etiology when there are no clinical, laboratory, or radiological abnormalities. Other blood tests, ultrasound, computed tomography scan, and endoscopy are ineffective in evaluating RAP without early warning signs.

MANAGEMENT

The primary goals of managing RAP in children are to improve the quality of life, lessen parent and child anxiety about the severity of the illness, and reduce pain-related impairment.[14]

To solve this kind of difficult challenge, a multidisciplinary team approach is essential. The usage of medications to treat RAP in children has yet to be backed by strong evidence.[15] Medical treatment with GI prokinetic or antispasmodic medications is ineffective. Parents and the child should receive adequate assurance that there is no severe organic disease and be advised on stress management techniques. A lifestyle change could be beneficial. Many parents use dietary modification as a crucial tactic to control RAP in their kids. The improvement of stomach discomfort is only slightly impacted by increasing daily fiber intake. There is no evidence to support the usage of probiotics.

For children with RAP, cognitive behavioural therapy, hypnotherapy, yoga exercises, and acupuncture have been proven to be more effective than traditional treatments.[6,7,16-18] At the same time, the evidence for this advantage is still shaky, and more extensive, multicentre trials are needed to substantiate it.

CONCLUSION

RAP is among the most prominent symptoms when children endure numerous bouts of stomach discomfort over a lengthy period. Thorough clinical examination and thorough history-taking are the most important procedures for treating a young child with RAP. During a physical examination, particular emphasis should be made on ruling out the previously mentioned organic causes. Parents and children should be provided appropriate confidence that no significant organic disease is present, as well as stress management measures.

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