

Recurrent Abdominal Pain: an Etiological Study among in a Referral Children's Medical Center in Iran

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Abstract

Objective: Recurrent abdominal pain (RAP) affects a significant number of children each year. It can be defined as experience of at least three episodes of pain, severe enough to affect activities, over a period of three months. The purpose of this study was to determine the organic and non-organic causes of RAP. Also, evaluate different variables of RAP such as age, sex, location and duration of pain, accompanying symptoms and stressful life events in two groups.

Material & Methods: During one year period from October 2003 to September 2004, 70 children (aged 4-12 years), were investigated in a referral Children's Center in Tehran. All patients underwent a thorough interview and complete physical examination and an initial sample of blood, urine, and stool evaluation. If any evidence of alarm symptoms (such as vomiting and night pain) were observed, additional studies were performed including abdominal ultrasonography, radiography, and/or upper gastrointestinal Endoscopy.

Findings: An organic cause was found in 21 (30%) patients and non-organic cause was identified in 49 (70%) cases. Main observations in non-organic groups were: more periumbilical pain location, positive history for stressful life events in child and their family. Also, gastrointestinal problems were the most common organic causes in 60% of children. Other organic causes were urinary tract infections 10%, kidney stone 10%, cholelithiasis (5%), Giardiasis (15%), and abdominal migraine (5%). Endoscopy seems to be a safe and reliable method in diagnosis of a number of organic lesions otherwise not detected by ordinary investigations. Our data suggest that among the children with RAP, non-organic causes are more commons (70%) than organic causes (30%).

Conclusion: This study showed that in spite of accessing to better instruments in medical sciences in recent decades, the percentage of nonorganic RAP in children is still high.

Key Words: Recurrent abdominal pain, Children, Stressful life events, Organic abdominal pain, Non-organic abdominal pain, Giardiasis,

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Introduction

Recurrent abdominal pain (RAP) is a significant child health problem and is commonly associated with functional impairment and with anxiety in child and their parents. Affected children and their families experience distress which could interfere with their ability to perform regular daily activities. There is little has been published in this regards from Iran.

Chronic abdominal pain has been reported to occur in 10-15% of children^[1,2]. Onset of symptoms of RAP after age 14 is rare, at which time more traditional symptoms of irritable bowel syndrome usually observed. Also, Onset of symptoms in a child less than 4 years old often requires a more organic work up^[2]. RAP was first introduced in the pediatric literature by Apley and Naish in the late 1950s. They considered children to have recurrent abdominal pain if they had experienced at least 3 episodes of pain, severe enough to affect activities, over a period of at least 3 months^[1]. The precise pathophysiology that results in abdominal pain is still not clearly understood, but the current belief is that visceral hypersensitivity and changes in the brain-gut axis linking the central and enteric nervous systems are important mechanisms^[2]. As a result of advances in diagnostic methods over the past few decades, previously unrecognized causes of abdominal pain have been identified^[3, 4]. Today studies continue to show that no organic pathology can be found to account for the recurrent abdominal pain in the majority of children^[2].

RAP can be classified as either organic or non organic (functional), depending on whether a discrete cause is identified. In non organic RAP, there is no demonstrable evidence of a pathologic condition such as an anatomic, metabolic, infectious, inflammatory, or neoplastic disorder^[5]. The pain is characteristically in the midline and does not awaken the patient from sleep, and the child feels well between episodes and laboratory investigation are normal^[1, 6]. Some symptoms such as pain away from the umbilicus, vomiting, rectal bleeding, night pain and abnormal laboratory findings suggest organic evaluation. Prevalence of organic and non

organic causes of RAP is variable in different studies^[1, 2, 5].

Studies show that children with functional abdominal pain, like behaviorally disordered children, experience more life stressors than healthy controls^[7]. Despite of this, they have not been found to have an increased incidence of depression or other psychological disorders when compared with children with abdominal pain of organic origin^[5]. Raymer and colleagues found that psychological distress accompanies both organic and non organic groups and that psychological evaluation may not readily distinguish two groups^[8].

With this regards, the purpose of study was to determine the organic and non-organic causes of RAP. Also, evaluate different variables of RAP such as age, sex, location and duration of pain, accompanying symptoms and stressful life events in two groups.

Material & Methods

This is a cross sectional study of children aged 4 to 14 years with recurrent abdominal pain which evaluated at a pediatrics center in Tehran (Iran) during October 2003 to September 2004. This center is a referral hospital for sick children in Iran and lots of children referred from Tehran and other provinces for further evaluation.

The children were included if they had a primary complaint of intermittent abdominal pain of unexplained origin for more than three months duration. The pain was of sufficient severity to affect activity. Interfering with normal daily activity was defined on missing school or having a stop doing a routine daily activity during the pain. The term functional or non organic was used when no organic etiology could be found. Data collection was undertaken by a questionnaire asking the child and their parents and physical examination. The history of stress and its relation to pain was thoroughly investigated after good contact with the child and their family. Girls, whose pain was related to periods, were excluded from study. Also, children less than 4 and above 14 years of age

excluded from the study. Informed consent was taken from all subjects and their parents.

After a full history taking and physical examination, the following variables included in this study: Frequency, duration, localization of abdominal pain, associated symptoms such as loss of appetite, nausea, vomiting, occurrence of chronic negative stress and disorder in child and their family at that time and its possible relation to the recurrent pain, gastrointestinal disorders and migraine history in the family.

All patients underwent measurement of CBC, urine microscopy and culture, and stool examination for common bacterial pathogens, ova/cysts and occult blood. Other investigations such as endoscopy, abdominal ultrasonography, electroencephalography and barium study had been performed as clinically indicated. In the presence of these alarm symptoms or signs above investigation were done: Weight loss, gastrointestinal blood loss, significant vomiting, night pain, chronic severe diarrhea, persistent right upper or right lower quadrant pain, unexplained fever or abnormal physical findings [2]. Organic RAP was labeled when an organic cause was demonstrated.

All statistical analyses were performed using SPSS/PC statistical program (version 13 for Windows). The results are presented as mean \pm standard deviation and proportion. The chi-squared test and fisher's exact test were used for determination of stress factors in two groups. Statistical tests were conducted at the $P < 0.05$ significance level.

Findings

Seventy children have studied (47% boys and 53% girls). The age of subjects was 4 to 14 years (mean 7.9 years). Organic and non organic diagnosis were made in 30% (21 cases) and 70% (49 cases) children, respectively. Girls in functional group were more commonly affected than boys, 59% versus 41%. Details of pain characteristic and some associated symptoms are given in Table 1, 2.

Compared to children with organic RAP, those with functional problem had more percentage of associated symptoms and peri-umbilical location. Moreover, most children in organic group had pain in mid-epigastric location. Anorexia and vomiting included more percentage of accompanying symptoms in functional and organic groups, respectively.

Eighty percent of children with functional RAP had at least one stress factor, compared with 62% in another group (Table3) ($P=0.047$). Financial problems, school phobia, divorce, child anxiety and family history of gastrointestinal problems and migraine were more observed in those with nonorganic group than organic group. All of primary laboratory tests were normal in functional group in contrast to organic group which revealed anemia, urinary tract infection and giardiasis.

An organic cause was found in 21 (30%) patients and non-organic cause identified in 49 (70%) cases. In organic group, primary investigation revealed these alarm symptoms: vomiting (60%), gastrointestinal problems (%50),

Table 1- Pain characteristic of children with recurrent abdominal pain

Pain Characteristics		Non-Organic (N=49)	Organic (N=21)
Location	Periumbilical	25 (52%)	4 (19%)
	Mid-epigastric	15 (30%)	13 (62%)
	Both	4 (8%)	2 (9.5%)
	Others	5 (10%)	2 (9.5%)
Duration (mo)		3-36	3-48
Duration of attacks (min)	5-60	39 (80%)	13 (55%)
	61-120	7 (15%)	6 (30%)
	>120	2 (5%)	3 (15%)

Table2- Associated symptoms of children with recurrent abdominal pain

Accompanying Symptoms	Non-Organic	Organic	P-Value
Anorexia	62 %	57 %	0.5
Vomiting	25 %	60 %	< 0.001
Early Sati sty	53 %	33 %	0.18
Nausea	39 %	29 %	0.4
Pallor	33 %	19 %	0.19
Bloating	12 %	24 %	0.19
Headache	2 %	5 %	0.5

pallor (40%), night abdominal pain (25%) and urinary problems (20%). Evaluations in organic group demonstrated some of etiologies. Gastro-intestinal problems were the most common organic causes in 60% of children. Upper gastro-intestinal endoscopy in 10 patients revealed esophagitis and gastritis which six patients showed H. pylori infection. Two cases had only esophagitis. Endoscopy was safe and none of the patients had complication. Also we found renal problems in 4 cases (2 subjects had urinary tract infection and 2 had renal stone in ultrasound), giardiasis in 3 patients, abdominal migraine in 1 case and cholelithiasis in 1 case.

Discussion

In 1909, an English pediatrician, Still wrote: "I know of no symptom which can be more obscure in its causation than colicky abdominal pain in

childhood"^[9]. Today, almost a century later, the provocative fact is that Still's words more or less hold true. RAP in childhood is still a symptom often difficult to understand, and to find its cause is an elusive process.

Localization of pain could be effective in determining of pain etiology. Our study revealed that children in non organic group experience more periumblical pain than organic group. Literatures have shown that most episodes of functional pain are in midline, located from epigasrium to the infraumbilical region. The abdominal pain begin gradually , may occur at any time during the day and typically does not awake the child from sleep .On the other hand suddenly pain away from umbilicus associated with alarm symptoms such as night pain, growth deceleration, and altered bowl pattern should be always carefully evaluated to rule out some organic problems^[2,5]. Also, Comparing duration and attacks of RAP, accompanying symptoms and pain characteristic in study revealed almost

Table3- Some of stressful life events in child and their family in patients

Stressful factors	Non-Organic (N=49)	Organic (N=21)
Financial Problems	70 %	10%
School Phobia	30 %	10 %
Death of father	2 %	5 %
Divorce	15 %	5 %
Child anxiety	55 %	25 %
Previous Surgery in Child	12 %	5%
Complaints in family		
Gastrointestinal Problems	50%	38%
Migraine	23%	10%
Handicap	2%	-

the same results with other series^[1,4,10]. There the same results with other series^[1,4,10]. There was not significant relation between associated symptoms and RAP in two groups except for vomiting (Table2).

One of the most relations in our study was association of stressful factors with RAP especially in non-organic group. Compared with children in organic group, there was greater number of children in non-organic group who had at least one stress factor. There were significant associations between functional RAP and financial problems, a history of gastrointestinal problems such as peptic ulcer disease, IBS and a history of migraine in at least one of family members. Also these children had more experiences of school phobia, divorce in parents, child anxiety. Parental ill health may be a crucial risk factor for the onset of RAP or may have a significant influence on the course of disorder. Also, studies have suggested that there may be differences in the ways in which parents respond to children with RAP when they are ill, leading to suggestions that reinforcement of symptoms may play a role, as well as modeling of illness behavior^[10]. Researches have shown that the RAP children stayed away from school more, needed more attention when ill, and tended to show more anxiety in various ways. They usually had parents who reported more symptoms, and had suffered a greater number of stressful experiences in the few months before pain onset^[11]. Reassurance to child and their parents could be the best treatment for them^[2].

Since higher levels of negative affects and daily stressors have previously been shown to increase the vulnerability of children with functional RAP^[12,13], decreasing daily life stresses are more likely to maintain their function to be normal. Moreover, another study found no difference between patients with RAP and patients with minor organic disease (e.g., gastritis, esophagitis) on mothers' reports of family life events^[14]. Unfortunately our study is from small clinical samples, which may introduce selection bias with, for example, the most severely symptomatic children and the most anxious parents being overrepresented. This limitation of the current study precludes our

ability to draw conclusions beyond the recognition of significant associations.

An organic cause for abdominal pain was identified in 30 % of our patients. This is significantly higher than the 8% by Apley, and nearly equal to Croffie study^[1,15]. This may be due to accessing to utilize new technology methods such as endoscopy, ultrasound, and barium studies in these decades. It should be pointed that we studied children referred to this hospital for specialist investigation. The selection of patients may have yielded a greater proportion of organic disease than if an unselected population had been studied. This may also explain some of the differences between the previous reports on this issue^[1,10]. However, in spite of more access to special investigation in this center, the most subjects were in functional group. Similar findings observed in another study^[5].

Upper gastrointestinal endoscopy and pathology showed gastritis in 10 patients in which six patients were helicobacter pylori positive. H. pylori infection had been reported to be an uncommon cause of RAP in children by some studies^[16,17]. Moreover, there are high incidence of natural infection with H. pylori in developing countries, so it becomes extremely difficult to establish a cause and effect relationship with RAP^[18]. Also, esophagitis observed in two patients. Another study in this center on 500 patients with RAP showed 82% of them suffered of esophagitis^[19]. It should be noted that endoscopy demonstrated some causes of RAP in our study, so we can recommend it as a reliable method in diagnosis of organic lesions otherwise not detected by ordinary investigations. Similar observation confirmed this^[20]. One of other cause of RAP was Cholelithiasis which was detected on ultrasonography. Patient had not clinical features suggestive of chronic hemolytic anemia, liver disease or hyperlipidemia. Three patients had giardiasis which was managed with metronidazole. Studies have shown that massive infestation, as seen in the tropics, may give rise to RAP^[21]. Also, four patients UTI and renal stone. Therefore careful attention must be given in attempt to detect organic causes of RAP whenever it is probably.

Conclusion

Functional RAP is common among children in a primary care setting. This study showed children in functional group had a periumbilical location and more tendency to experience negative life events than children without that. Also in spite of accessing to better instruments in medical sciences in recent decades, the percentage of non-organic RAP remained high. In addition, this study showed in the presence of alarm symptoms investigation for finding the cause is necessary. Further studies will be needed to clarify these results.

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