



Volume: 2, Issue: 9, 392-395
Sep 2015
www.allsubjectjournal.com
e-ISSN: 2349-4182
p-ISSN: 2349-5979
Impact Factor: 4.342

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A Study on Etiological Profile and Outcome of Recurrent Abdominal Pain in Children Aged 1 to 14 Years

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Abstract

Recurrent abdominal pain is one of the most common cause of pain in children below the age of 15 years. The prevalence of RAP in children ranges from 10 to 20%. An organic lesion is present in 5 to 10% of children. Most of these patients turn out to have a nonorganic problem, and hence the condition may also be called functional recurrent abdominal pain. This study was conducted to find out etiology, compare various causes and outcome of recurrent abdominal pain in children in the age group of 1-14 years, presenting to M.K.C.G Medical College, Berhampur, Odisha. Children between 1-14 yrs of age who came to outpatient and inpatient blocks in the department of pediatrics with abdominal pain and meeting the criteria of recurrent abdominal pain were included in the study. A prospective sequential study of 75 children between age groups of 1-14 yrs from July 2012 to June 2013 was carried out. These children were subjected to thorough clinical history, physical examination, systemic examination, lab investigations and finally labeled to have either organic or nonorganic cause for abdominal pain. Out of total 75 children, 32% children had organic recurrent abdominal pain and 68% had non organic cause. Out of 24 diagnosed with organic cause of pain abdomen, causes include UTI followed by gastritis, worm infestation and sickle cell disease.

Keywords: RAP, Organic cause, Nonorganic cause.

1. Introduction

Recurrent abdominal pain is one of the most common cause of pain in children below the age of 15 years. Recurrent Abdominal Pain (RAP) in children was defined by Apley as "at least three episodes of abdominal pain severe enough to affect daily activities over a period longer than three months^[1,2]". The prevalence of RAP in children ranges from 10 to 20%. An organic lesion is present in 5 to 10% of children^[3,4]. RAP has been found to be common in the setting of school phobia, sibling rivalry and a family history of multiple abdominal complaints, psychological problems and disturbed interpersonal relationships.

Most of these patients turn out to have functional problem and hence the condition may also be called functional recurrent abdominal pain. Children and their families experience significant emotional and social consequences, as a result of pain and disability. It also causes a big financial burden in the form of investigations and loss of work of parents in order to attend to their children. Recurrent abdominal pain may be manifested as isolated paroxysms of periumbilical pain, as pain in the abdomen, pain with dyspepsia, and abdominal pain with dysfunction of the digestive tract. The incidence of organic and non-organic causes is variable in different studies. Hence proper evaluation is very important for the diagnosis and management of this vexing problem.

The Rome III criteria now categorize abdominal pain into^[5]

1. functional dyspepsia (FD)
2. functional abdominal pain (FAP) and functional abdominal pain syndrome (FAPS)
3. irritable bowel syndrome (IBS)
4. abdominal migraine

Studies of the prevalence of Recurrent Abdominal Pain have found disparate results, with rates ranging from 9% to almost 25%^[1,2]. Inconsistent use of diagnostic criteria and characteristics of the population being sampled (e.g., age, gender) contribute to the conflicting findings. In general, population-based studies suggest the Recurrent Abdominal Pain is experienced by 10% to 15% of school age children and almost 20% of middle school and high school students^[6]. As children grow older, the incidence of Recurrent Abdominal Pain appears to decrease in boys but not in girls^[2,7]. Clinically, Recurrent Abdominal Pain often coexists with other somatic symptoms, such as chronic headache, with rates of co morbidity ranging from 14% to 90%⁸. Long-term follow-up of children hospitalized for Recurrent Abdominal Pain has indicated that a

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smaller number, between 30% and 47% will have complete resolution of their symptoms [1, 9, 10]

In the etiology and pathophysiology of functional recurrent abdominal pain, factors such as genetic predisposition, autonomic nervous system, stress, and inflammatory process of the digestive tract should be considered. The pathogenesis mostly accepted in present days for functional recurrent abdominal pain consists of alterations in the gastrointestinal motility and/or visceral hypersensitivity [11]. The ambiguity of attitudes that these pain crises provoke in most doctors and families frequently induces to an overabundance of examinations [6]. Enough evidence however has accumulated to suggest that it is a disorder of the extensive Gut-Brain axis [12]. Children with functional recurrent abdominal pain usually present a bad adaptation to the painful process. These factors that intensify the crises are of environmental, behavioral, and emotional origin, and make the children feel more pain, or predisposing them to new episodes of pain [13].

Aims & Objectives

1. To find out the etiology of recurrent abdominal pain in children.
2. To compare (various) organic and nonorganic causes of recurrent abdominal pain in children.
3. To study the outcome of recurrent abdominal pain in children in the age group 1-14 years.

Materials and Methods

Study Period- July 2012 to June 2013

Study Design- prospective cross-sectional study.

Place of Study- Department of pediatrics, MKCG medical college

Inclusion Criteria

Children between 1- 14 yrs of age who came to M.K.C.G Medical college outpatient and inpatient blocks in the department of pediatrics with abdominal pain and meeting the Apley's criteria of recurrent abdominal pain are included.

Exclusion Criteria

Children less than 1 yr and more than 14 yrs of age and children in between 1-14 yrs not meeting the criteria of recurrent abdominal pain.

A total of 75 children were included on the study. All the children greater than or equal to 3 yrs of age and meeting the Apley's criteria of recurrent abdominal pain were included and children between 1-3 yrs with abdominal pain severe enough to disturb the daily activities and sleep were also included. Organic recurrent abdominal pain was labeled, when a) an organic cause was demonstrated, b) there was clinical and laboratory response to treatment, c) there was sustained remission from abdominal pain at least 3 months after treatment.

These children were subjected to thorough clinical history like onset, localization, character, radiation, relation of pain to food and daily activities, alteration of bowel habits, dysuria, dyspepsia etc, physical examination, systemic examination and lab investigations. Screening investigations such as complete blood counts with peripheral smear, erythrocyte sedimentation rate, concentration methods for isolation of ova and cysts in stool, stool for occult blood, reducing substances; urine microscopy and culture and sensitivity; liver function tests, sickling test were done wherever needed. Other helpful investigations like plain and contrast films of abdomen, ultrasound abdomen and other invasive investigations like

upper GI endoscopy done for few cases to know the exact cause of the disease. The data collected was subjected for appropriate statistical method of analysis.

Results

In the present study of total 75 children, 32% children were diagnosed with organic recurrent abdominal pain and 68% children were diagnosed with non organic cause. Of total children 68% were in the age group of 7-14 years indicating a late peak. There was no significant co-relation found between age and diagnosis of organic or non-organic cause. 45% of non-organic cause was in males and 54.9% in females. Among organic causes 41.66% was in males and 58.33% in females. A total of 44% were males and 56% were females. A significant correlation was found with occurrence of non organic causes in females.

Out of 75 children, 47.05% of non organic recurrent abdominal pain was in the periumbilical region and 52.94% away from umbilicus. 33.33% of organic recurrent abdominal pain was in periumbilical region and 66.66% away from umbilicus. A significant correlation was found between non organic cause and recurrent abdominal pain away from umbilicus. 24 children were diagnosed with organic cause with UTI followed by gastritis, worm infestation, sickle cell disease, renal colic, abdominal TB and there was one case of abdominal epilepsy.

In relation to clinical features a significant correlation was found between sleep disturbance and occurrence of organic recurrent abdominal pain, fever and weight loss with occurrence of organic recurrent abdominal pain. With prevalence of hematological disease like sickle cell disease, thalassemia, and infectious disease like malaria in this part of India organomegaly had significant correlation with non organic causes of recurrent abdominal pain. Other clinical features like diarrhea, constipation, dyspepsia, relation to food, abdominal fullness did not have any significant correlation with aetiology of recurrent abdominal pain.

In the present study 19.6% children with non organic recurrent abdominal pain had school phobia and 19.6% had generalized body ache, 11.76% children had history of sibling rivalry. Anorexia was in 5.88% in non organic causes in contrast of 29.16% in organic causes. Marital discord was more in non organic causes of recurrent abdominal pain. We observe that above factors are associated with both organic and non organic cause of recurrent abdominal pain. Out of 75 children 84% were treated on in patient basis and 16% were treated on outpatient basis. Patient treated on in patient basis 43 were found to have non organic cause and 20 were found to have organic cause. Patient treated on outpatient basis 8 were found to have non organic cause and 4 were found to have organic cause.

Table 1: Age incidence of types of recurrent abdominal pain

Aetiology / Age	Non –organic (n=51) (68%)	Organic (n=24) (32%)	Total (n=75)
1-3 yrs	6(11.76%)	2(8.3%)	8(10.66%)
4-6 yrs	13(25.49%)	3(12.5%)	16(21.33)
7-14 yrs	32(62.74%)	19(79.16)	51(68%)

n=number of cases

Table 2: Children with different causes of Recurrent Abdominal Pain In Relation To Age and Sex

Diagnosis	AGE (Mean \pm SD)	Sex	
		Male	Female
Non-organic	7.76 \pm 3.71	23	28
Worm infestation (16.66%)	8 \pm 3.61	1	3
UTI (20.83%)	8 \pm 2.35	1	4
Abdominal epilepsy (4.16%)	10 \pm 0.00	0	1
Sickle cell disease (16.66%)	7.75 \pm 3.30	0	4
Abdominal TB (8.33%)	11 \pm 0.00	0	2
Gastritis (20.83%)	11 \pm 4.64	4	1
Renal colic (12.5%)	8 \pm 2.65	2	1

Table 3: Children with Recurrent Abdominal Pain In Relation To Associated Psychological Factors

Sl. No.	Psychological Factor	Non-Organic (n = 51)	Organic (n = 24)
1	No Specific Factors	15(29.41%)	7(29.16%)
2	School Phobia	10(19.60%)	2(8.33%)
3	Sibling Rivalry	6(11.76%)	1(4.16%)
4	Family History Of I B S	0	0
5	Generalized Ache	10(19.6%)	5(20.83%)
6	Anorexia	3(5.88%)	7(29.16%)
7	Nocturnal Enuresis	3(5.88%)	1(4.16%)
8	Sleep Disturbance	2(3.92%)	1(4.16%)
9	Marital Discard	2(3.92%)	0

Table 4: Children with Recurrent Abdominal Pain In Relation To Clinical Features

Sl. No.	Clinical Features	Non-Organic (n=51)	Organic (n=24)	Correlation coefficient(r)
1	Sleep disturbance	4(7.84%)	7(29.16%)	-0.33
2	Diarrhea	0	2(8.33%)	0.02(ns)
3	Constipation	2(3.92%)	2(8.33%)	-0.19(ns)
4	Dyspepsia	2(3.92%)	2(8.33%)	-0.19(ns)
5	Relation to food	1(1.96%)	1(4.16%)	-0.17(ns)
6	Dysuria	2(3.92%)	4(16.66%)	-0.12(ns)
7	Abdominal fullness	7(13.72%)	3(12.5%)	-0.08(ns)
8	Fever & weight loss	2(3.92%)	4(16.66%)	-0.24
9	Palor	8(15.68%)	6(25%)	-0.12(ns)
10	Organomegaly	9(17.64%)	7(29.16%)	-0.27
11	Abdominal tenderness	13(25.49%)	12(50%)	-0.32

ns = not significant.

Discussion

An organic cause for abdominal pain was identified in 32% of our patients. This is significantly higher than the 8% by Apley [1], and nearly equal to Croffie study. Recurrent abdominal pain is common in school-aged children and young adolescents. Different studies estimate the prevalence at 10-15%. As suggested by Apley, the dominant view has been that recurrent abdominal pain is expression of physiological maladjustment in response to family or school problems in predisposed children.

Among the organic causes, urinary tract infection accounted for 20.83% comparable with other studies. Oesophagitis and gastritis accounted for another 20.83%. But in contrary some studies like Romanezuk *et al* [14] showed 45.7%, Mavromichalis [15] noted oesophagitis, antritis and duodenitis in 93%, Bansal *et al* [16] found 43%. This difference in incidence is due to the fact that upper GI endoscopy and

analysis of gastric aspirate was done in all cases of abdominal pain in studies by Bansal, Romanezuk, and Mavromaichalis. This further led to the increased association of helicobacter pylori with the cases of recurrent abdominal pain. A special mention regarding Sickle cell disease which is very much prevalent in this part of the country accounted for 16.66% of organic causes in the present study.

In the present study, 54.9% Of non organic and 58.33% Of organic causes were found in females. For the purpose of study the children were divided into age groups of 1-3 yrs, 4-6 yrs, 7-14 yrs, toddler, preschool and school going age groups. In the present study 10.66% children came under the age group of 1-3 yrs, 21.33% children were in 4-6 yrs group and 68% were in 7-14 yrs age group. This was comparable with the study by Niyaz *et al* [17], where 48.2% were in the age group of 5-12 yrs, followed by 28.2% and 23.5% in the age group of 3-5 and 1-3 yrs respectively.

Out of 75 children many complained of vague pain both in umbilical and other abdominal areas. 47.05% of non organic pain was in periumbilical region and 66.66% of organic cause showed pain away from the umbilicus. 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. Studies have shown that most episodes of functional pain are in midline, located from epigasrium to the infraumbilical region [18].

In the present study school phobia and generalized body ache accounting for 19.6% each were the main psychological factors associated with non organic cause and anorexia accounting for 29.16% was the main psychological factor associated with organic cause followed by generalized body ache accounting for 20.83% and other psychological factors were associated with both organic and non organic causes. Comparing our present study with previous studies of Ballani *et al*, Niyaz *et al* and Gupta *et al*, we found that factors mentioned above are associated with both Non Organic Recurrent Abdominal Pain and Organic Recurrent Abdominal Pain. In the present study 50% of organic causes were associated with abdominal tenderness, followed by sleep disturbance in 29.16%, dysuria and fever with weight loss with 16.66% each which is comparable with other studies. Altered bowel habits like diarrhea and constipation were more in organic causes as compared to non organic causes of recurrent abdominal pain.

In the present study 84% children were treated on in patient basis as because most cases were referred for this hospital for specialist investigation, and 16% were treated on outpatient basis and followed up for 3 months. Outcome was good in both organic and non organic causes with 90-95% children showing pain free intervals, comparable with studies like Niyaz *et al*, in whom 80-90% children showed good response.

Conclusion

Non organic cause of recurrent pain abdomen is the most common pain abdomen than the organic cause of recurrent pain abdomen. This study showed children with non organic 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 recurrent abdominal pain remained high. In addition, this study showed in the presence of alarm symptoms investigation for finding the cause is necessary. Psychological instability in the family and children are the major cause of recurrent pain abdomen. Psychological intervention such as

cognitive behavior and family therapy are effective in reducing symptoms and improving school attendance.

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