

Research Paper

## Clinico-Etiological Profile of Recurrent Abdominal Pain in Children Aged 5-15 Years

Authors

Lakhan Poswal<sup>1</sup>, Saransh Sabal<sup>2</sup>, Sandip Gediya<sup>3</sup>, Suresh Goyal<sup>4</sup>

<sup>1,4</sup>Professor, <sup>2,3</sup>Resident, Department of Pediatrics, R.N.T. Medical College, Udaipur, Rajasthan, India

Corresponding Author

Saransh Sabal

Department of Pediatrics, RNT Medical College, Udaipur, Rajasthan, India

Mob.-7737120306, Email: [drsaranshsabal10@gmail.com](mailto:drsaranshsabal10@gmail.com)**ABSTRACT**

**Background:** Recurrent abdominal pain (RAP) is one of the most common chronic complain of childhood affecting 8-12% of school children. In school aged children, an organic cause can be found in less than 10% of children with recurrent abdominal pain. In some of the studies, organic cause of RAP was found to be higher. Emotional components have been attributed as underlying components in non-organic RAP.

**Material and Method:** This hospital based prospective study was done on 82 children aged 5 to 15 years attending Bal Chikitsalaya, R.N.T Medical college, Udaipur, fulfilling Apley's criteria of RAP. Detailed history, physical examination & investigations that included CBC, urine examination, stool examination, USG abdomen and pelvis were done in all patients. Psychological stressors were also looked for in all children.

**Results:** Majority (62.19%) of patients were in the age group of 5 to 8 years with 56.10% males and 63.41% children were 1<sup>st</sup> in birth order. Majority of the parents of study children had low education attainment and belonged to lower socio economic families. Pain abdomen was localised in periumbilical region in most of the patients (92.68%) and except one patient who had hemorrhagic ovarian cyst, all patients had pain during day time only. Sixteen (19.51%) patients had abnormal finding on USG i.e. mesenteric lymphadenopathy (14), ovarian hemorrhagic cyst (1) and enlarged solitary kidney (1). Other laboratory findings were urinary tract infection and protozoal infection. Psychological stressors were identified in 36 (43.90%) patients.

**Conclusion:** On evaluation of children with RAP, in most of the patients (73.17%) no abnormal finding was seen. Mesenteric lymphadenopathy was commonest (17.07%) USG finding and UTI was seen in 10.98% patients.

**Keywords:** Recurrent abdominal pain, functional RAP, chronic abdominal pain, ultrasonography.

**Introduction**

Recurrent abdominal pain (RAP) in children is defined as the presence of at least three episodes of abdominal pain severe enough to affect their activities over a period longer than three months.<sup>(1)</sup>

During 1<sup>st</sup> year of age, colic predominates; in preschool children, the "growing pains" are the most frequent ones; between 4 and 12 year of age, abdominal pain is frequent; and among adolescents, cephalgia is the most common complaint of pain. Abdominal pain is sometimes a sign of life threatening disease. It can also have a

harmless cause but it can impair the child's self-perception of health and interfere markedly with everyday activities.<sup>(2,3)</sup>

Recurrent abdominal pain, a common complaint affecting 8-12% of school children.<sup>(4,5)</sup> In a large study of school aged children, an organic cause was found in less than 10% of children with recurrent abdominal pain.<sup>(6,7,8)</sup> In some of the subsequent studies, the percentage of children with organic RAP was found to be higher than initially reported by Apley.<sup>(9,10,11)</sup>

RAP is traced to organic illness (ORAP) such as parasitic infestation, urogenital disease, inflammatory bowel disease, peptic ulcer disease and other factors in 5-10% cases. Pain in remaining 90-95% of these children is nevertheless believed to be caused by more subtle physiological adjustments and/or have emotional components. The emotional components of RAP involve stressful life events, school phobia, sibling rivalry, individual psychopathology, family's psychopathology and dynamics, all of which may predispose, the child and adolescent to RAP.<sup>(1,9,10)</sup>

### Subjects and methods

This hospital based prospective study was done on 82 children aged 5 to 15 years, attending the Pediatric Outpatient Department, at Bal Chikitsalaya, R.N.T Medical college, Udaipur, during Feb. 2016 to Jan. 2017, fulfilling Apley's criteria of RAP. A written informed consent was taken from parents of all children who fulfilled the inclusion criteria. Proper ethical clearance was taken from the Ethical Committee of the institution before starting the study. Detailed history & physical examination was noted in a structured proforma. Routine investigations including complete blood counts, urine examination, stool examination and USG abdomen & pelvis were done in all patients. Specific investigations like tTG IgA antibody to rule out celiac disease were performed whenever indicated. Children who had a probable organic cause were treated accordingly and were followed up for a period of at least three months. Only

those patients who satisfied the following criteria were considered to be suffering from ORAP: (i) An organic cause was demonstrated; (ii) There was clinical and laboratory evidence of sustained response to treatment for at least three months after therapy.

### Results

Out of 82 children, 51 (62.19%) patients were in the age group of 5 to 8 years, 25 (30.49%) in age group 9-12 years and remaining 6 (7.32%) cases were in the age group 13 to 15 years, with the mean age of  $7.9 \pm 2.69$  years. Forty six (56.10%) cases were males and 36 (43.90%) cases were females (Table 1). Almost 80% of fathers and 70.6% mothers of study children had education level up to schooling. Patients belonging to lower socio economic status were more (70.73%) as compared to middle socio economic family (28.05%).

Eleven (13.41%) children had constipation. Sixteen patients (19.51%) had abnormal USG findings, the most common finding was mesenteric lymphadenopathy (>8mm short diameter) in 14/82 (17.07%) cases followed by ovarian hemorrhagic cyst and enlarged solitary kidney in one patient each. Urinary tract infection was found in 9 (10.98%) and protozoal (entamoeba histolytica) infection in one patient only (Table 2). Pallor was the most common associated physical finding seen in 12 (14.63%) patients followed by hepatomegaly and splenomegaly in 2.44% and 1.22% patients respectively (Table 3).

Majority of children 76 (92.68%) had periumbilical pain. All the children with mesenteric adenitis localized pain in the periumbilical region only whereas, 90.91% and 55.5% patients of constipation and UTI had pain in the periumbilical region. Diurnal variation was seen in 81 (98.78%) patients. All the patients with constipation, mesenteric adenitis and UTI had pain during day time only. Nocturnal pain was only reported by the patient who had ovarian hemorrhagic cyst (Table 4). Most common timing of pain abdomen (72.84%) was morning hours / before going to

school. Seven (8.64%) patients reported pain during school time, 7 (8.64%) in the evening, 5

(6.18%) after coming from school and 3 (3.70%) at meal time.

**Table 1:** Distribution of cases according to age and gender

Age (Years)	Male	Female	Total
5-8	33(40.24%)	18(21.95%)	51(62.19%)
9-12	10(12.20%)	15(18.29%)	25(30.49%)
13-15	3(3.66%)	3(3.66%)	6(7.32%)
Total	46(56.10%)	36(43.90%)	82(100%)

**Table 2:** Abnormal clinical and laboratory findings in patients with RAP

Finding	Cases
Constipation	11 (13.41%)
Mesenteric lymphadenopathy	14 (17.07%)
Urinary Tract Infection	9 (10.98%)
Ovarian Cyst	1 (1.22%)
Enlarged solitary Kidney	1 (1.22%)
Protozoal Infection	1 (1.22%)

**Table 3:** Clinical findings in the patients with RAP

Clinical findings	Cases
Pallor	12 (14.63%)
Hepatomegaly	2 (2.44%)
Splenomegaly	1 (1.22%)
Total	15 (18.29%)

**Table 4:** Relationship of nature of pain abdomen (RAP) with abnormal laboratory findings

Variables	Constipation (n=11)	Mesenteric Lymphadenopathy (n=14)	UTI (n= 9)	Ovarian Cyst (n=1)	Enlarged solitary Kidney (n=1)	Protozoal Infection (n=1)
Periumbilical pain	10 (90.91%)	14 (100%)	5 (55.5%)	0	0	1
Pain localized away from umbilicus	1	0	4 (44.4%)	1	1	0
Nocturnal pain	0	0	0	1	0	0
Diurnal variation	11 (100%)	14 (100%)	9(100%)	0	1	1

## Discussion

In our study 62.19% children were in age group 5-8 years with mean age of  $7.9 \pm 2.69$  years. In the study done by K Stordal et al<sup>(12)</sup> (2001) on 44 children aged 2-15 years with recurrent abdominal pain, the mean age was 8.3 years. In another study done by Iqbal A. Menon et al<sup>(13)</sup> (2009), to determine the causes of recurrent abdominal pain (RAP) in 152 children, age range was 2-15 yrs and mean age was 8.9 years. Findings of both the studies are similar to our study.

In present study, 46 (56.10%) cases were males. Similarly in a study conducted by Bharat Balani et

al<sup>(9)</sup> (2000), to find out organic and psychological causes of RAP in 35 children from 5-12 years of age males were affected more (62.8%) but the difference in both the studies was not statistically significant.

Most of the fathers (79.6%) and mother (70.6%) of study children had education level up to schooling. Majority (70.73%) of patients belonged to lower socio economic status. Similar results were found in study, conducted by Boey C et al<sup>(14)</sup> (2000), who determined the prevalence of recurrent abdominal pain (RAP) among Malaysian school children aged 11 to 16 years. Prevalence

was higher in children whose fathers had a lower educational attainment ( $P= 0.002$ ) and in those with lower family income ( $P<0.001$ ). The higher number of children from lower socio economic status could also be due to overall trend of more people from this class attending government hospitals.

In our study 76 (92.68%) patients localised pain in periumbilical region. All the children with mesenteric lymphadenopathy localised pain in the periumbilical region only whereas, 90.91% and 55.5% patients of constipation and UTI respectively had pain in the periumbilical region. Diurnal variation was seen in 81 (98.78%) patients. Out of total study patients only one child who had ovarian hemorrhagic cyst had pain during night. Similar study was conducted by Devanarayana NM et al<sup>(18)</sup> to detect etiology of RAP, who found that in over half of the patients (69.09%) pain was felt in the periumbilical region, nocturnal pain was presented in 12.72% cases. In a similar study, conducted by LiebmanW<sup>(8)</sup> in 1978 on clinical pattern of 119 children with RAP, pain was located most commonly in the periumbilical region 57%.

In our study, 16 cases (19.51%) had abnormal finding on USG out of which commonest was mesenteric lymphadenopathy in 14 cases. Ovarian hemorrhagic cyst and enlarged solitary kidney were present in 1 case each. Other laboratory findings were urinary tract infection in 9 (10.98%), and protozoal (entamoeba histolytica) infection in one patient. In a similar study, conducted by Vayner et al<sup>(15)</sup> enlarged mesenteric lymph nodes were found in 61.4% of the patients with RAP. Compared to their study, the percentage of children with enlarged mesenteric lymph nodes is low in our study probably because the criteria to label significant mesenteric lymphadenopathy was short-axis diameter  $>8\text{mm}$  in our study whereas it was 4 mm or more in their study. In a similar prospective study conducted by Van der meer et al<sup>(16)</sup> on 93 children aged between 5.5 -12 years with recurrent abdominal pain, organic abnormalities were found in 3 cases

(3.2%) only [duplex kidney, unilateral kidney agenesis, enlarged spleen (9 cm) one case each]. In three patients residual post void urine was found to which they considered non pathological. In a study conducted by Wewer V et al<sup>(17)</sup> (1997), routine abdominal ultrasonography was done in 120 children (aged 3-15 years) with recurrent abdominal pain. Eight children (7%) revealed causes like gallbladder stone, splenomegaly, and urogenital abnormalities. On the contrary in a study conducted by Balani B et al<sup>(9)</sup> (2000) on 35 children aged 5-12 years with recurrent abdominal pain, organic abnormalities were found in more percentage of patients (UTI in 15.4%, giardiasis in 38.4%, giardiasis and worm infestation in 7.7%, chronic gastritis in 26.9%, esophagitis in 26.9%, amoebiasis in 7.7% and worm infestation in 7.7%).

Pallor was the most common associated physical finding seen in 12 (14.63%) patients followed by hepatomegaly and splenomegaly in 2.44% and 1.22% patients respectively. Devanarayana NM et al<sup>(18)</sup> reported associated symptoms in more number of patients which included headache (41.81%), anorexia (30.9%), lethargy (23.6%), weight loss (27.27%), constipation (12.73%), dysuria (18.18%), and joint pain (18.18%). LiebmanW<sup>(8)</sup> (1978) studied clinical pattern of 119 children with RAP. He found pallor (61%) as most common associated finding followed by tiredness (45%), anorexia (34%), dizziness (25%), headache (20%), vomiting (19%), fever (17%), diarrhea (12%) and constipation (10%). Above symptoms/ sign in their study indicate that more patients had organic cause of RAP.

We conclude that in most of the patients with RAP (73.17%) no abnormal finding is seen on investigations. In our study, mesenteric lymphadenopathy was found in 17.07% patients and UTI in 10.98%.

## References

1. Apley J, Nalsh N. Recurrent abdominal pain: Afield survey of 1000 school children. Arch Dis child 1958;33:165-70.

2. Bufler Ph, Gross M, Uhlig HH. Recurrent abdominal pain in childhood. *Dtsch Arztebl Int* 2011;108(17):205-304.
3. Kristjansdottir G. Prevalence of pain combinations and overall pain: a study of headache, stomach pain and back pain among school children. *Scand J Med* 1997;25:58-63.
4. Boey CC, Goh KL. Predictors of recurrent abdominal pain among 9 to 15-year-old urban school children in Malaysia. *Acta Paediatr* 2001;90(3):353-55.
5. Ramchandani PG, Hotopf M, Sandhu B, Stein A. The epidemiology of recurrent abdominal pain from 2 to 6 years of age: results of a large, population-based study. *Pediatrics* 2005;116(1):46-50.
6. American Academy of Pediatrics Subcommittee on Chronic Abdominal Pain and NASPGHAN Committee on Abdominal Pain: Chronic abdominal pain in children: a clinical report of the American Academy of Pediatrics and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. *J Pediatr Gastroenterol Nutr* 2005;40:245-48.
7. Shanon A, Martin DJ, Feldman W. Ultrasonographic studies in the management of recurrent abdominal pain. *Pediatrics* 1990;86:35-38.
8. Liebman W. Recurrent abdominal pain in children. *Clin Pediatr Phila*.1978;17:149-53.
9. Balani B, Patwari AK, Bajaj P, Diwan N, Anand VK. Recurrent abdominal pain - A reappraisal. *Indian Pediatr* 2000;37:876-81.
10. Dutta S, Mehta M, Verma IC. Recurrent abdominal pain in Indian Children and its relation with school and family environment. *Indian Pediatr* 1999;36:917-20.
11. Buch NA, Ahmad SM, Ahmad SZ, Ali SW, Charoo BA, Hussan MU. Recurrent abdominal pain in children. *Indian Pediatr* 2002;39:830-34.
12. Stordal K, Nygaard EA, Bentsen B. Organic abnormalities in recurrent abdominal pain in children. *Acta Paediatr* 2001;90:638-42.
13. Iqbal AM, Lal MN, Murtaza G, Jamal A, Bhatti AJ, Tariq S. Recurrent abdominal pain in children. *Pak J Med Sci* 2009;25:1:26-30.
14. Boey CC, Yap SB, Goh KL. The prevalence of recurrent abdominal pain in 11 to 16 years old Malaysian school children. *Journal of Pediatric and Child Health* 2000;36:114-16.
15. Vayner N, Coret A, Polliack G, Weiss B, Hertz M. Mesenteric lymphadenopathy in children examined by US for chronic and/or recurrent abdominal pain. *Pediatr Radiol* 2003; 33: 864-867.
16. Van der Meer SB, Forget PP, Arends JW, Kuijten RH, Van engelshoven JMA. Diagnostic value of ultrasound in children with recurrent abdominal pain. *Pediatr Radiol* 1990;20:501-503.
17. Wewer V, Strandberg C, Paerregaard A, Krasilnikoff PA. Abdominal ultrasonography in the diagnostic work-up in children with recurrent abdominal pain. *Eur J Pediatr* 1997;156:787-788.
18. Devanarayana NM, de Silva DG, de Silva HJ. Aetiology of recurrent abdominal pain in a cohort of Sri Lankan children. *J Paediatr Child Health* 2008;44:195-200.