Original Article

Prevalence of Helicobacter pylori in children with recurrent abdominal pain

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Abstract

Introduction: Recurrent abdominal pain (RAP) in children is defined as at least three episodes of abdominal pain during three month period and severe enough to affect their activities. It is frequent diagnostic problem faced by Pediatricians. Helicobacter pylori (HP) is a pathogen of human gastric mucosa and is considered to be one of the major cause of RAP. The prevalence of HP infection increases with age. The study is to determine the prevalance of HP seropositivity, and the cause of RAP in children aged between 5-16 yrs.

Methods: It was a prospective observational study conducted in department of child health, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu. A total of 60 patients of aged between 5-16 years diagnosed with RAP were enrolled. Detailed history , physical examination and relevant laboratory investigations including USG abdomen and HP antibody Enzyme linked immunosorbent assay(ELISA) were performed.

Results: The prevalence of H Pylori seropositivity in patient with RAP was found to be 16.7%. Among the total 60 patients enrolled in this study with RAP,35 patients (58.34%) the cause was unknown.

Conclusion: In majority of patients with RAP, the cause was not found (58.3%) and the organic causes were found in 38.41% of the patients. The most common cause of organic origin was Hpylori infection(16.7%).

Key words: Prevalence, H. Pylori, Recurrent abdominal pain.

Introduction

Recurrent abdominal pain (RAP) is a common problem in pediatric patients, and is the most common painful health problem in school-aged children[1]. Apley defined RAP as at least three episodes of abdominal pain over a period of three months, with pain of an intensity affecting the behavior of the child.[1] On initial presentation, RAP may mimic any acute abdominal disorder, and may prompt extensive evaluation and unnecessary invasive investigation[2,3,4,5].

RAP is reported in 10-12% of school aged children in developed countries[1,6]. Studies from Malaysia, and Sri Lanka had shown the prevalence of RAP in school children to be 10.2% and 10.5% respectively[7]. RAP occurs most commonly between ages 4 and 14 years with peak incidence at 4-6 years and at 7-12 years[7].

RAP may be due to organic illnesses such as parasitic infestations, urogenital disease, inflammatory bowel disease and peptic ulcer disease[4]. The detail of causes is listed in table I[4]. A study done by Joshi B. J. in Civil service hospital, Kathmandu, Nepal showed that out of 47 children with RAP, organic causes were found in 41 children while non-organic causes in 6 children[8].When the cause is not found, RAP might be due to functional bowel disorder[4]. Functional gastrointestinal disorder is a condition with uncertain etiology, and is a diagnosis

of exclusion and is an important cause of recurrent abdominal pain[4]. When organic causes of RAP is not found bio-psychosocial model is one of the concept which suggests a complex interplay between many different factors[7,9]. These factors include behavioural, emotional, environmental, social and psychological etc[9].

Table 1 Causes of Recurrent abdominal pain

Gastrointestinal	Urinary tract
Chronic constipation	Urinary tract infection
Inflammatory bowel disease	Urinary calculi
Parasitic infection(e.g. amoeba, giardia)	Pelvi-ureteric junction obstruction
Dietry intolerance (e.g. lactose)	
Gastro-oesophageal reflux disease	**Gynecological**
Helicobacter pylori infection	Ovarian cyst
Celiac disease	Endometriosis
Peptic ulcer	Pelvic inflammatory disease
Gastritis	**Miscellaneous**
Hepatitis	Abdominal epilepsy
Gall bladder Calculi	Physical,emotional and sexual abuse
Chronic pancreatitis	
Functional dyspepsia	
Irritable bowel syndrome	
Functional abdominal pain syndrome	
Abdominal Migrane	
Aerophagia	

H. pylori infection is common in developing countries like Nepal. Inadequate living condition, poor hygiene and overcrowding are main contributing factors. Commonly found in age group between 5-16 years. Helicobacter pylori (HP) is a pathogen of human gastric mucosa and is considered to be the major cause of chronic gastritis and duodenal ulcer recurrence[10]. Childhood appears to be a high-risk period for Hpylori infection[10]. So, child with recurrent abdominal pain may have H pylori associated mild chronic gastritis[10,11]. H Pylori as a cause of RAP has been studied in different studies[11-15]. H. pylori infection is one of the cause of RAP in one quarter to one third of children with RAP [2,7]. It is seen that the rate of H. pylori infection in children and adolescents with RAP might vary in different geographical regions[4]. The infection rate is higher in low socioeconomic group because of overcrowding, non-availability of safe drinking water, open toilets in the house and improper sewage disposal system[16,17]. The prevalence of H. pylori infection increases with age both in developed and developing countries[18]. Several other factors like sex, literacy, educational level, profession[18].

The prevalence of H pylori infection in children with RAP is not known in Nepal. This study might help to find out the different causes of recurrent abdominal pain and also the prevalence of H pylori in recurrent abdominal pain in children presenting to hospital.

Methods

It was a prospective observational study. The study was done in Inpatient and Outpatient department of Department of Pediatrics TUTH. The total duration of study was ten months from 28 Mangsir 2069 to 28 Bhadra 2070(13 December 2012 to13 September 2013). Children in the age group between 5yrs to 16 yrs who fulfilled the criteria for recurrent abdominal pain were enrolled. Total 200 children were screened and 60 were taken in the study. They all met the criteria of RAP according to Apley definition. Included at least three attacks of pain occurring over a period of 3 months and pain should be severe enough to affect activities.

Inclusion criteria

• Children between 5-16 years with RAP.

Exclusion criteria

- Already diagnosed case of pain abdomen who present with recurrent pain.
- Recent use of antibiotics or if the patient is in Triple therapy.
- Family h/o inflammatory bowel disease, perirectal inflammation.
- Acute Surgical conditions -Acute Obstructive lesion of gut, Intestinal obstruction, malrotation, Meckelsdiverticulum, volvulus, diverticulum and duplication of gut.
- Acute disorder of genitourinary system-AGN, acute pyelonephritis, acute cystourethritis,
- Psycological and behavioral problem .
- refusal to obtain consent.

Methods

The patient who met the inclusion criteria, regarding history and examinations were taken in the study. The parents and/or care givers were explained about the nature of the study and written informed consent was obtained from the parents of the children. The study was approved by Institutional Review Board (IRB) of Institute of Medicine, Kathmandu,Nepal. The initial evaluation of a patient including a detail history in which duration of pain, aggravating and relieving factors, pain associated with other symptoms or not, whether the pain was acute or chronic, history of bowel habit, surgical cause or medical cause was identified. The history of school missing, night waking due to pain, affecting the daily activities or not, associated altered bowel pattern, number of medical visit, previous medication history were obtained. Severity of pain were assisted by pain scale. All investigations regarding the study were done and the report were obtained and followed. Vitals were taken, general and systemic examination was done, anthropometry was taken. Parents were informed about the disease condition and further investigations was send to find out the cause if needed. CBC, Blood culture and sensitivity (C/S), urine routine andC/S, Stool RE/ME, USG abdomen andH pylori serology. Other investigations like Upper GI Endoscopy, CT of abdomen and Colonoscopy were done according to the patient`s condition if indicated. The detection of IgG antibody to Helicobacter pylori was determined by enzyme-linked immunosorbent assay (ELISA) from blood in microbiology lab of TUTH.

Results

Demographic characteristics of patients

Among the 60 children's in the age group of 5 to 16 years maximum number of children belonged to the age group of 5-11 years accounting for 73.33%. Majority of patients were male comprising of 71.8%. When considering the socioeconomic status, most of the children belonged to upper middle class and middle lower middle class accounting for 46.67% and 35% respectively. When considering the nutritional status of the patient according to body mass index (BMI), majority of the patients fall between 5-84th centile constituting 60%. Fifty two percentage of the patients belonged to joint family and 48% of the patients belonged to nuclear family. Considering the literacy of the mother, 65% were literate whereas 35% were illiterate. On analysing the occupation of the mothers 28% were professional, 31.7% were semiprofessional, 35% were clerk and very few have skilled, semiskilled and unskilled profession. Demographic characteristics of the patients is listed in table 2

Table 2 demographic characteristics of the patients.

Age group	5-11yrs	73.33%
	12-16yrs	26.67%
Sex	Male	71.67%
	Female	28.33%
Socioeconomic status	Upper	8.33%
	Upper middle	46.67%
	Middle lower middle	35%
	Lower upper lower	8.33%
	Lower	1.6%
Body mass index	<5 centile	13.33%
	5-84 centile	60%
	85-94 centile	13.33%
	95 centile	13.33%
Family	Nuclear	48.33%
	Joint	51.67%
Mother literacy	Literate	65%
	Illiterate	35%
Maternal occupation	Professional	28%
	Semiprofessional	31.7%
	Clerk	35%
	Skilled	1.7%
	Semiskilled	1.7%
	Unskilled	1.6%

Prevalence of H Pylori seropositivity

The prevalence of H pylori seropositivity in patients with RAP was found to be 16.7%.

Causes of RAP

In most of the patients (58%) with RAP, the cause was not found i.e. unknown.Psychological cause was found in (3.34%) of the cases.Psychological problem was assessed according to the treatment history (if the patient is on treatment of psychological problem) and counseling advised to the patient during evaluation. Organic cause comprises of 38.41% of children. The second most common cause was found to be H. pylori infection(16.7%) followed by Giardiasis (5.01%) as shown in table 3. Mesentricly madenopathy (3.34%), helminthiasis(3.34%), acalculus cholecystitis (1.67%) , appendicular (1.67%) lump and Hydatid cyst (1.67%) was diagnosed on the basic of ultrasonogram of abdomen and pelvis and confirmed by CT scan of abdomen and pelvis. Colonic and rectal polyp (1.67%) was found on colonoscopy.

Table 3 Causes of Recurrent abdominal pain

Causes	No	%
1 Unknown	35	58.34
2 H Pylori	10	16.7
3 Giardiasis	3	5.01
4 Psychological	2	3.34
5 UTI	2	3.34
6 Mesentric lymphadenopathy	2	3.34
7 Helminthiasis	2	3.34
8 Acalculus Cholecystitis	1	1.67
9 Appendicular Lump	1	1.67
10 Hydatid Cyst	1	1.67
11 Colon and Rectal Polyp	1	1.67

Discussion

The present study was done to find out the prevelance of H pylori seropositivity, and to find out the causes of RAP in the age group of 5-16 years. The prevalence of H pylori seropositivity with RAP in the current study was found to be 16.7%. The prevalence of H Pylori in RAP in various studies is variable. Studies by Masoodpoor et al[19], and Gatea[20]et al for the prevalence of H pylori seropositivity with RAP found it to be 40%, and 64% respectively. These prevalence are quite high as comapred to the current study, as in the current study H Pylori ELISA was used to detect H Pylori infection whereas these studies used stool antigen test which has higher sensitivity however, the study done by O'Donohoe[21] is comparable to current study as they also used ELISA method to detect H Pylori infection. Heldenberg et al[22]found the prevalence of H Pylori by gram stain and urease test of endoscopic biopsy sample to be 54%.

In majority of the children with RAP in the current study, the cause was unknown(58.3%). Organic causes comprises 38.41% and psychological cause comprises of 3.34%. Among the organic cause H Pylori was detected in 43.4%. H Pylori infection was detected by H pylori ELISA. Other organic causes were giardiasis (5.01%), mesentric lymphadenopathy (3.34%), helminthiasis (3.34%), acalculus cholecystitis (1.67%), appendicular lump (1.67%), hydatid cyst (1.67%) and colon and rectal polyp (1.67%). Apley and Naish suggested that organic pathology cannot be identified in 90% of children suffering from this problem[1]. Buch et al[23] reported the organic cause in up to 82% of children with RAP whereas Devanarayana et al[24] in Srilanka found the organic cause in 29%[24]. Balani et al[25] observed organic causes in 90%. Giardiasis was the commonest organic cause found in 60% either alone or with other parasites followed by ascariasis 20% alone. Other organic cause were UTI in 6.7%, abdominal tuberculosis in 6.7%, eosophagitis/gastritis in 2.9% and gall stones in 1.4%. Similar study done by Joshi B G et al[8] in children aged between 4 and 15 years, showed that organic disorder as the commonest cause of RAP in 87% of the children. Among the organic etiology, parasitic infestation was the commonest (49%) followed by constipation. The current study is different from other studies[8,23,25] where organic cause is higher may be because majority of children in this study belong to middle to high socio-economic status and children of literate mothers[26].

Conclusion

In majority of children, the cause of recurrent abdominal pain was unknown (58.34%%) and in 38.41% organic etiology was found.

The following are the limitations of the study.

- The study was conducted with a small sample size of 60 children in the age group of 5-16 years who met the criteria of recurrent abdominal pain. Therefore

we cannot generalize this result to all children presenting with RAP.

- H Pylori ELISA test is less sensitive and specific as compared to stool antigen test and invasive method like UGI endoscopy guided biopsy proven by histological examination.

Conflict of interest: None declared.

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