

Frequency of Helicobacter Pylori Infection (Detected by Gastric Biopsy Culture and Histopathology) in Children Presenting with Recurrent Abdominal Pain (RAP)

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ABSTRACT

OBJECTIVE: To determine the frequency of Helicobacter pylori infection (detected by Gastric Biopsy culture and histopathology) in children presenting with recurrent abdominal pain.

DURATION: Six months from June 2014 to November 2014.

SETTING: Department of Pediatric unit II, Civil Hospital Karachi, DUHS.

STUDY DESIGN: Descriptive study, Case series

METHODOLOGY: Children 2-15 years of age with either sex, presenting with history of recurrent abdominal pain as per defined criteria were included in the study. Children were excluded from the study if having history of intake of Steroids, antibiotic, NSAIDs, H₂ receptor blockers, proton pump inhibitors or bismuth subsalicylate preceding 4 weeks prior to endoscopy, already diagnosed as having H. pylori infection, inflammatory bowel disease, chronic liver disease, acute appendicitis and renal disease. Recurrent abdominal pain (RAP) was diagnosed on the basis of history of recurrent severe abdominal pain occurring at-least once in a month for 3 consequent months. Prior to upper GI endoscopy and biopsy, other causes of recurrent abdominal pain were ruled out by performing appropriate tests that includes complete blood picture, urine detailed examination, stool detailed examination, stool culture and sensitivity, liver function tests, renal function tests, abdominal and pelvic ultra-sonograms. Upper Gastrointestinal endoscopy was performed in all patients

RESULTS: Out of 60 cases of RAP 61.7% were males and 38.3% were females. Male to female ratio was 1.60. Mean age of children was 7.71 ± 2.68 years. Mean duration of RAP was 5.55 ± 1.83 months. Frequency of RAP episodes per month ranged from 3-11 episodes (mean 5.97 ± 2.09). On culture of total 60 biopsy cases H Pylori was positive in 36.7% while it was negative in 63.3% cases. Out of 22 children having H. Pylori infection 14 were males and 8 were females. Mean age of children with H. pylori positive was 8.09 ± 2.18 years. Mean duration of RAP in positive case was 5.77 ± 1.88 months.

Conclusion: H pylori infection is a major cause of RAP in children and therefore should always be considered in differential diagnosis. Large scale studies are warranted to build national database.

KEY WORDS: Recurrent abdominal pain, H Pylori.

This article may be cited as: Nazimuddin, Chohan MN, Memon IA. Frequency of Helicobacter Pylori Infection (Detected by Gastric Biopsy Culture and Histopathology) in Children Presenting with Recurrent Abdominal Pain (RAP). J Liaquat Uni Med Health Sci. 2017;16 (04):205-8. doi: 10.22442/jlumhs.171640534

INTRODUCTION

Helicobacter Pylori is a gram-negative rod that is present under the stomach mucosa. After colonization, it causes inflammation in stomach that can be detected by gastric biopsy. Helicobacter pylori infection has been reported as a cause of gastritis in children¹. Nowadays the prevalence of H Pylori induced gastritis is decreasing in developed countries². National data however showed that the frequency of H pylori infection in children having recurrent abdominal pain is between 38%³ to 74.4%⁴. Helicobacter pylori Gastritis (H. pylori) is a common cause of recurrent abdominal pain. The incidence is >3% in developing countries, while 0.5% in developed countries⁵. In

children, recurrent abdominal pain (RAP) is defined as, 3 episodes of severe abdominal pain within last 3 months. Worldwide prevalence of RAP in children is 34% and therefore it is a common presenting complaint to general physicians. The prevalence of RAP in children >5 years of age is 10%⁶. Recurrent abdominal pain (RAP) affects school attendance and physical activities in children. Recurrent headaches and recurrent abdominal pain is the most common pain syndrome in children⁷.

First peak of recurrent abdominal pain occurs in children between 5 and 7 years of age (5-8%), equally in boys and girls and the second peak, occurs between 8 and 12 years of age (25%) and is more

common in girls⁸. Other causes of RAP other than H Pylori gastritis are worms, infestations, renal disorders, genital disorders, intestinal disorders, peptic ulcer disease and other factors in 5-10% of cases⁹.

H Pylori can be detected by several methods. It is important to do endoscopy in every suspected case. During endoscopy, after doing the gastric biopsy H Pylori can be detected by different tests, like histological evaluation of gastric mucosa, H Pylori culture, polymerase chain reaction, and the rapid urease test. If endoscopy is not planned then alternative non-invasive tests are performed like, the urea breath test, serology, and stool antigen test. According to various studies H. pylori infection is diagnosed and treated, based on H. pylori serology but this cannot differentiate between current or past infection¹⁰.

A similar study reported, from same department showed 3 years ago, 54% prevalence of H pylori detected by gastric biopsy culture and histopathology¹¹. Soon after an intensive program counseling and preventive measure against H Pylori was started by department. Therefore the aim of this study to determine the frequency of H pylori infection in children presenting with recurrent abdominal pain at Civil Hospital Karachi so that impact of counselling and preventative measure can be assessed.

Objective

To determine the frequency of Helicobacter pylori infection (detected by gastric biopsy culture and histopathology) in children presenting with recurrent abdominal pain.

METHODOLOGY

This descriptive case series was done with non-probability purposive sampling technique conducted at Department of Pediatric unit II, Dow University of Health Sciences & Civil Hospital Karachi from June 2014 to December 2014. Sample size (n=60) was calculated by using formula $X=Z(C/100)^2r(100-r)$, with 90% confidence interval, prevalence of recurrent abdominal pain in children 5%.

Children 2-15 years of age with either sex, presenting with history of recurrent abdominal pain (epigastric) as per operational definition were included in the study. Children were excluded from the study if having history of intake of Steroids, antibiotic, NSAIDs, H₂ receptor blockers, proton pump inhibitors or bismuth subsalicylate preceding 4 weeks prior to endoscopy, already diagnosed as having H. pylori infection, inflammatory bowel disease, chronic liver disease, acute appendicitis and renal disease.

After taking informed consent from parents, Proforma was filled for each patient. RAP was diagnosed based on history of recurrent severe abdominal pain

occurring at least monthly for 3 consequent months. Prior to upper GI endoscopy and biopsy, other causes of recurrent abdominal pain were ruled out by performing appropriate tests that includes complete blood picture, urine detailed examination, stool detailed examination, stool culture and sensitivity, liver function tests, renal function tests, abdominal and pelvic ultra-sonograms.

Upper Gastrointestinal endoscopy was performed in all patients by the endoscopy team comprising the professor, the researcher and a senior postgraduate FCPS-II trainee (having 20 years, two years & four years of practical experience in pediatric endoscopy respectively) at department of Pediatric Unit-II.

Biopsy samples in each patient were taken from two sites i.e., antrum and corpus. Biopsies were kept in a transport medium at 4° C, for not more than 24 hours as Pylori is very delicate and needs to be culture as soon as possible. Slides were prepared using routine hematoxylin and eosin (HE) stain and Giemsa stain. HE stained slide was used to evaluate inflammatory cells, and Giemsa stain slide used to detect H. pylori. The slides were reviewed by two pathologists. Identification of H. pylori was based on morphological characteristics and positive catalase, oxidase, and urease reactions. All data was analyzed by using SPSS version 22. Frequency & percentages were calculated for qualitative variables like sex, frequency of H. pylori. Mean, standard deviation was calculated for quantitative variables like age and duration of RAP. Stratification was done with regards to age, gender & duration of RAP to see their effect upon outcome.

RESULTS

Total 60 patients of recurrent abdominal pain age between 2-15 years were included in the study. Among these 61.7% were males and 38.3% were females with a ratio of 1:60 as shown in Figure-1. Mean age of children was 7.71 ±2.68 (Table.1). Majority (63.33%) of children were aged 6-10 years (Figure-2). Mean duration of RAP was 5.55 ±1.83 months (Table.1). Frequency of RAP episodes ranged from 3-11 episodes per month (mean 5.97 ±2.09).

On histopathological examination of total 60 biopsies, H Pylori was detected in 22 (36.66%). The mean age of H pylori children were 8.1 ±2.2 years ranging from 4 -12 years. Overall most common age group for this study was between 6-10 years (n=38, 63.33%) and most cases (42.10%) of H pylori were positive in the same age group. (Table 2).

Frequency of H pylori with respect to gender is shown in table-3. Out of 37 males, H. pylori was positive in 37.8% and from 23 females, it was positive in 34.8% cases. Majority of positive cases (59.1%) had RAP for

4-5 months' duration. Mean duration of RAP in positive case was 5.77 ±1.88 months (Figure-1).

TABLE I: AGE OF THE CHILDREN AND DURATION OF RECURRENT ABDOMINAL PAIN (n=60)

	Minimum	Maximum	Mean	Standard deviation
Age of childs (years)	2	15	7.717	2.681
Duration of RA (months)	3	10	5.55	1.83

TABLE II: H. PYLORI WITH RESPECT TO AGE GROUP OF THE CHILDREN OF RECURRENT ABDOMINAL PAIN (n=60)

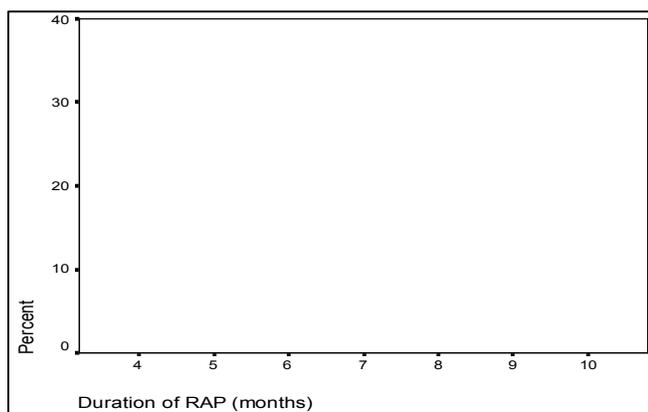
Age (years)	Total	H. Pylori Positive
2 – 5	7	2 (28.57%)
6 – 10	38	16 (42.10%)
11 – 15	15	4 (26.66%)
Total	60	22 (36.66%)

Mean ±SD = 8.1 ±2.2 years, Min - Max = 4 – 10

TABLE III: HELICOBACTER PYLORI WITH RESPECT TO GENDER OF THE CHILDREN OF RECURRENT ABDOMINAL PAIN

Gender	Total (n = 60)	Helicobacter Pylori n = 22	Percent
Female	23	8	34.8%
Male	37	14	37.8%

FIGURE I: DURATION OF RECURRENT ABDOMINAL PAIN (MONTHS) IN H. PYLORI POSITIVE CASES



Mean ±SD = 5.8 ±1.9 months, Min - Max = 4 – 10

DISCUSSION

In the present study the prevalence of H. pylori

infection, in patients with RAP, as detected by gastric biopsy culture is 36.7%, mean ±SD age of these children was 8.1 ±2.2 years. A study conducted within same institute in years 2012 reported 54% prevalence of H Pylori infection¹¹. A decreased in the prevalence may be attributed to improved physicians' awareness about the problem. Similar studies from Rawalpindi showed 32%³ and 32.5%¹² prevalence of H Pylori infection. A study from India had reported 40% prevalence of H pylori infection in children with RAP⁹. Memon et al from Karachi Pakistan reported it to be 31%⁶. In contrast to the current and foregoing studies, a study from Europe¹³ showed the prevalence of H pylori as high as 51.7%, however it may be due to fact that they used methods, quite different to the current study, like Urea breath test, stool for H Pylori antigens.

Although the gender distribution for H pylori cases was not statistically significant, yet we observed male preponderance (37.8%) as compared to female (34.8%). Other studies have also reported higher prevalence in male as compared to female. One study¹² reported 53.1% prevalence in male and 46.9% in female, another study³ reported it 58% and 42% respectively.

In this study increasing prevalence of H. pylori was found with age. Out of 22 children having H. Pylori infection, minimum age of children with H. pylori positive was 4 years and maximum age was 12 years (Mean age 8.1 ±2.2 years). Majority of children had age between 6 – 10 years, 16 (42.1%) out of 38 cases in this age group were positive for H. Pylori. In this study majority of positive cases (59.1%) had RAP for 4-5 months' duration. Mean duration of RAP in positive case was 5.77 ±1.88 months.

A different international study showed 52% children with recurrent abdominal pain were infected with H. pylori, this is higher than in our study that showed 36.7% children infected with H Pylori. The prevalence of H. pylori infection increased with age from 21.3 % under 3 years of age to 72% after age 15 years and this may be reason for high prevalence of H Pylori in their study because they had more elder children as compared to our study¹⁴.

In another different international study, the prevalence of H. pylori infection in children suffering from recurrent abdominal pain was 9%, it is much lower than our study and it may be due to better hygienic condition and screening¹⁵.

CONCLUSION

As we found 36.7% prevalence of H pylori infection in children with RAP, therefore high index of suspicion, careful clinical evaluation and lab workup is required in all cases of RAP, before labeling such cases as

“functional”.

CONFLICT DECLARATION

There is no conflict of interest to declare by any author.

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