

Prevalence of Helicobacter Pylori Infection in Children with Recurrent Abdominal Pain

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Abstract

Background: Recurrent abdominal pain (RAP) in children is a widespread issue, with *Helicobacter pylori* infection being one possible contributor. *H. pylori* is linked to gastrointestinal disorders, including gastritis and peptic ulcers, which can present with symptoms like abdominal pain. Understanding its role in recurrent abdominal pain (RAP) is essential for effective diagnosis and treatment. This study aimed to investigate the prevalence of *Helicobacter pylori* infection in children with recurrent abdominal pain (RAP).

Methods: The cross-sectional study took place in the Pediatric Gastroenterology, Hepatology & Nutrition Department of Dhaka Shishu (Children) Hospital, Bangladesh, from January 2019 to December 2020. Seventy children with RAP were selected using a purposive sampling technique. To diagnose *H. pylori* infection, both rapid urease tests and histopathology of gastric biopsy samples were employed. The data collected were analyzed with SPSS version 22.0.

Results: The prevalence of *Helicobacter pylori* infection among participants was 36%. Children aged 11-15 were more likely to test positive compared to those aged 5-10 ($p=0.042$). There was also a significant association between *H. pylori* infection and lower socioeconomic status ($p=0.003$), and having RAP for >6 months ($p=0.003$). The source of drinking water did not impact the results; most infected cases exhibited poor growth ($p=0.003$).

Conclusion: Over one-third of children with recurrent abdominal pain may have a *Helicobacter pylori* infection. Risk factors for this infection include age over 10 years, lower socioeconomic status, and recurrent abdominal pain lasting more than six months, potentially leading to poor growth.

Keywords: Endoscopy, *Helicobacter pylori*, Histopathology, Prevalence, RAP, Recurrent abdominal pain

1. INTRODUCTION

Abdominal pain ranks among the most frequent symptoms experienced by children [1]. British pediatrician J. Apley discovered that roughly 10% of school-aged children suffer from recurrent bouts of abdominal pain, which he termed recurrent abdominal pain (RAP) [2]. The prevalence of RAP among school-aged children ranges from 4% to 25% [3]. In Bangladesh, 11.5% of children are affected by this condition [4]. Recurrent abdominal pain is both a common

and complex diagnostic issue in pediatrics. Although it is generally regarded as functional (nonorganic) pain, organic causes are identified in 5% to 10% of cases [5].

With advancements in medical technology and a deeper understanding of the pathophysiology involved, more organic causes are increasingly being recognized [1]. Parasitic infestations, urogenital diseases, inflammatory bowel diseases, and peptic ulcer disease linked with *Helicobacter pylori* infection are typical organic

causes of recurrent abdominal pain [6]. Certain studies propose that *H. pylori* might be responsible for RAP in up to a quarter to a third of the affected children [7]. Recognized as one of the most prevalent chronic bacterial infections, *H. pylori* affect at least 50% of the global population and is more commonly found in developing nations [8]. The prevalence of *H. pylori* can vary both across different populations and within particular groups of the same population [9]. *Helicobacter pylori* infection is usually contracted in early childhood and can persist if left untreated [10]. Although acute infection is generally asymptomatic, it is a primary cause of chronic gastritis in children and is suspected to contribute to recurrent abdominal pain [11]. The infection may result in severe inflammation and has the potential to progress to atrophy, metaplasia, and even cancer in later life [12]. In children, *H. pylori* infection differs from adults regarding epidemiology, host response, clinical features, associated diseases, and approaches to diagnosis and treatment [13]. Accurate diagnosis is essential for effectively managing recurrent abdominal pain, with a variety of invasive and noninvasive tests available—each offering distinct advantages and limitations [14]. For diagnosing *H. pylori* infection in children, gastrointestinal endoscopy accompanied by histology remains the gold standard [15]. A study by Guarner et al. [16], which reviewed literature from 1999 to 2009, found this method to be the only reliable way to diagnose and confirm the infection in children. Noninvasive tests typically do not provide the necessary accuracy, which challenges the 'test and treat' approach based on these methods [10]. While most research has focused on adults, there has been less emphasis on children. Some pediatric studies point to a significant association between *H. pylori* infection and recurrent abdominal pain, with a more pronounced impact in developing countries than in developed ones [17]. The objective of this study was to assess the prevalence of *Helicobacter pylori* infection in children with recurrent abdominal pain.

2. METHODOLOGY

This cross-sectional study was carried out in the Department of Pediatric Gastroenterology, Hepatology & Nutrition at Dhaka Shishu (Children) Hospital in Bangladesh, from January 2019 to December 2020. The study involved 70 children experiencing recurrent abdominal pain, who were selected using purposive sampling. Researchers gathered demographic data, clinical manifestations, and laboratory parameters with a

standardized data sheet. Each participant underwent an upper GI endoscopy with gastric biopsies taken. *H. pylori* infection was confirmed through a rapid urease test and histopathological analysis of the biopsy samples. To determine the association of different parameters with infection, the researchers employed unpaired t-tests, chi-square tests, and Fisher's exact test. The study targeted children aged 5 to 15, from both genders, who were clinically diagnosed with recurrent abdominal pain (RAP) based on the inclusion criteria. Children were excluded if they had active upper gastrointestinal bleeding, pre-existing conditions like urinary tract infections, inflammatory bowel disease, malignancies, or other organic pain causes. Additionally, those who had used antimicrobials, proton pump inhibitors, H₂ receptor blockers, or NSAIDs in the two weeks preceding the endoscopic examination were not included. Data analysis was conducted using SPSS version 23.0.

3. RESULT

Most of our participants (52.9%) were male, and most (65.7%) were younger than 11 years. The subjects predominantly came from middle-class families (45.7%) and utilized tap water (68.6%) for drinking. Furthermore, the majority maintained a normal Body Mass Index (BMI). In this study, according to both the rapid urease test and histopathological findings, the prevalence of *Helicobacter pylori* infection was found 36% among the total participants. This study examines the association between *H. pylori*-positive status and various parameters in subjects. The results demonstrated a significant association between *H. pylori* positivity and both rapid urease test results and histopathology findings of gastritis, with all cases of histopathology-confirmed gastritis testing positive for *H. pylori* ($p < 0.001$ for both). In terms of age, children aged 11-15 were more likely to be positive for *H. pylori* compared to those aged 5-10, with a significant association ($p = 0.042$). However, gender showed no significant association, indicating similar *H. pylori* prevalence in males and females ($p = 0.915$). Socioeconomic status played a significant role, with a higher prevalence of *H. pylori* positivity in the lower class compared to the middle and upper classes ($p = 0.003$). Although the source of drinking water was not significantly associated with *H. pylori* status ($p = 0.125$), the duration of illness over 6 months was significantly associated with higher *H. pylori* positivity ($p = 0.003$). Moreover, bodyweight showed a significant association; underweight subjects demonstrated a higher prevalence of *H.*

pylori compared to those with normal weight, while no overweight subjects were positive (p = 0.003). These findings suggest potential

demographic and socio-economic factors influencing H. pylori prevalence among the studied subjects.

Table 1. Demographic characteristics of the study group (n=20).

Variables	n	%
Age (years)		
5-10 Yrs.	46	65.7%
11-15 Yrs.	24	34.3%
Mean ±SD	8.58 ±2.80%	
Gender		
Male	37	52.9%
Female	33	47.1%
Socioeconomic status		
Lower class	24	34.3%
Middle class	32	45.7%
Upper class	14	20.0%
Water source		
Tube well	22	31.4%
Tap water	48	68.6%
BMI		
Normal weight	42	60.0%
Underweight	19	27.1%
Overweight	9	12.9%

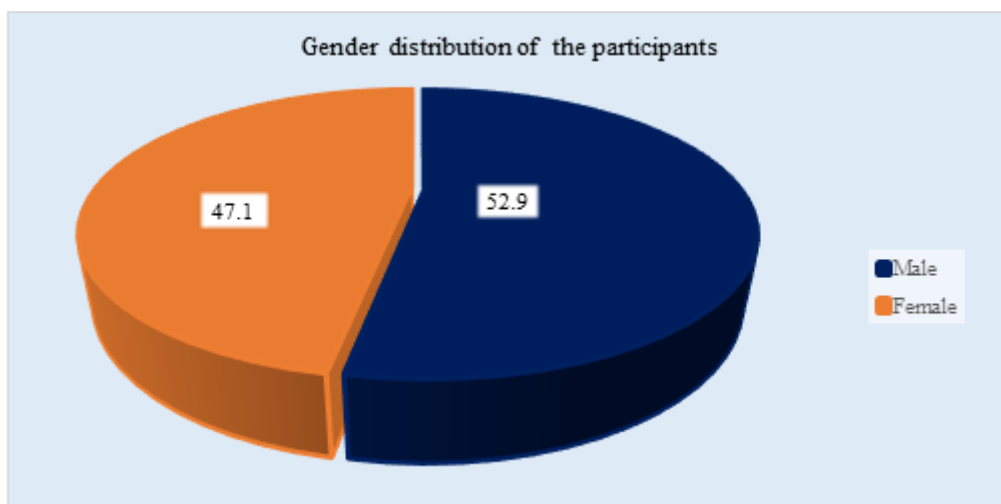


Figure 1. Pie chart showed gender wise patients distribution (N=70)

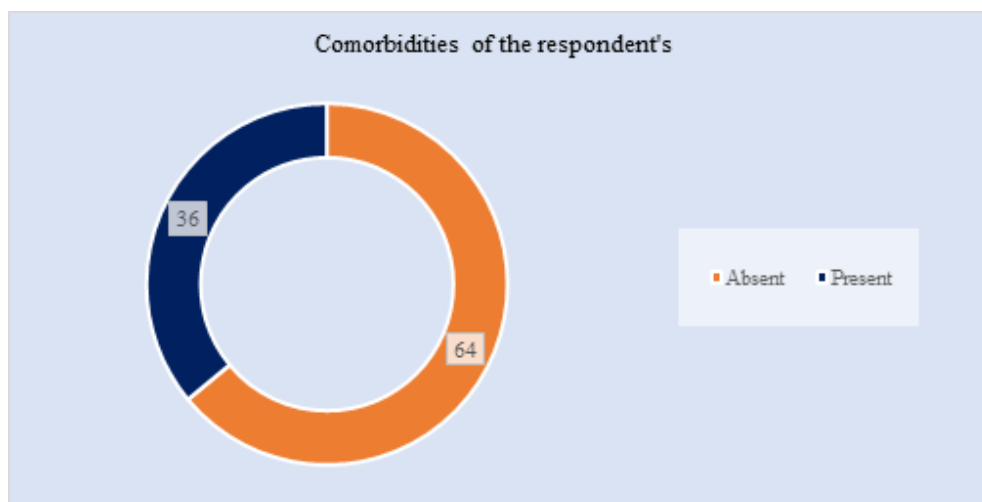


Figure 2. Ring chart showed Prevalence of H. pylori infection as per rapid urease test and histopathological findings

Table 2. Association of *H. pylori*-positive subjects with different parameters (N=70)

Variables	H. pylori		P-value
	Positive	Negative	
n			
Rapid urease test results			
Positive	25	4	<0.001
Negative	0	37	
H. pylori gastritis (Histopathology)			
Present	25	0	<0.001
Absent	0	45	
Age (Year)			
5-10	12	34	0.042
11-15	13	11	
Gender			
Male	13	24	0.915
female	12	21	
Socioeconomic status			
Lower class	15	9	0.003
Middle class	8	24	
Upper class	2	12	
Source of drinking water			
Tube well	5	17	0.125
Tap water	20	28	
Duration of illness			
>6 months	15	11	0.003
≤6 months	10	34	
BMI/Bodyweight			
Normal weight	13	29	0.003
Underweight	12	7	
Overweight	0	9	

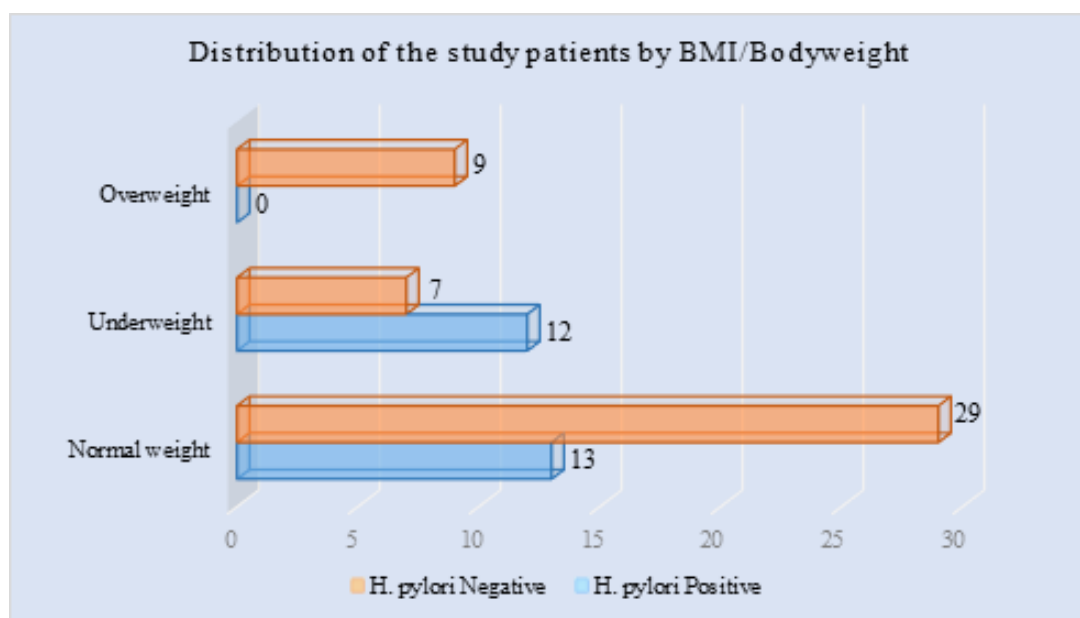


Figure 3. Ring chart showed BMI/Bodyweight wise patients distribution (N=70)

4. DISCUSSION

In this study, the prevalence of Helicobacter pylori infection was found to be 36% among participants, as determined by both the rapid urease test and histopathology. This rate is comparable to the findings of Punhal, Malik, and

Iqbal [18], who reported a prevalence of 32.5%, and Nazimuddin, Chohan, and Memon [19], who found a rate of 36.7%.

The mean age of H. pylori-positive patients in this study was 9.49±2.47 years, closely aligning with the 9.40±3.54 years reported by Punhal,

Malik, and Iqbal [18]. Additionally, most subjects with recurrent abdominal pain (RAP) and H. pylori infection were over 10 years old, which is consistent with results from Nadeem et al. [20] and Yu et al. [21]. We observed that males (52%) were marginally more affected by H. pylori infection than females (48%), though the association between gender and infection was not statistically significant. Similarly, another study [20] found that gender was not a significant influencing factor for H. pylori infection. However, a different study [22] observed that males were 1.3 times more likely to be affected than females. In terms of socioeconomic status, this study revealed that 60% of children with recurrent abdominal pain (RAP) who were H. pylori positive belonged to low socioeconomic groups, and this association was statistically significant. This is akin to the findings of Nadeem et al. [20], who reported that 92% of affected children were from low socioeconomic status groups. In the current study, most subjects experienced recurrent abdominal pain (RAP) for six months or less. However, 60% of those with RAP lasting more than six months were significantly associated with H. pylori infection.

This aligns with Alimohammadi et al. [23], who observed progressed infection with increasing age. The study found no significant relationship between H. pylori infection and the source of drinking water, even though 68.6% of subjects drank tap water. This is consistent with findings from another study [24], which reported that 65.5% of safe water drinkers and 52.9% of unsafe water drinkers were H. pylori-infected. Additionally, Alimohammadi et al. [23] noted that 58.3% of tap water drinkers and 52% of boiled water drinkers were infected. This study showed a significant difference in body weight related to H. pylori infection ($p=0.003$). While 60% of recurrent abdominal pain (RAP) subjects were of normal weight, 12 out of 19 underweight subjects with RAP were H. pylori positive. Similarly, Richter et al. [25] reported that infected subjects experienced poor growth ($p=0.02$). Regarding symptoms, 8.6% of subjects with RAP had associated vomiting, 12.9% had pallor, and 45.7% experienced abdominal tenderness. None of these symptoms were significantly associated with H. pylori infection. This aligns with findings from Motamed et al. [26], where 10% had associated vomiting, 62.5% had abdominal tenderness, and 23.8% had anemia, with none being significant with H. pylori infection.

5. CONCLUSION & RECOMMENDATION

More than one-third of children suffering from recurrent abdominal pain may be infected with Helicobacter pylori. Key risk factors for this infection include being older than 10 years, living in lower socioeconomic conditions, and experiencing abdominal pain for over six months. These risks highlight the need for targeted interventions aimed at early detection and treatment. Without timely management, the infection can adversely affect growth, emphasizing the importance of addressing both the medical and socioeconomic dimensions. By tackling these underlying factors, healthcare providers can help improve the quality of life and growth outcomes for affected children.

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