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Assessment of *H. pylori* in children with diarrhoea

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Abstract

Background: *H. pylori* has been shown to play a major role in the pathogenesis of gastric atrophy, chronic diarrhea, and growth retardation in children. The present study was conducted to assess *H. pylori* in children with diarrhoea.

Materials and Methods: 84 children with acute bacterial gastroenteritis due to Salmonella or Shigella of both genders were enrolled. 2 groups were formed. Group I were *H. pylori* with diarrhoea and group II were with no history of diarrhea and no bacterial growth in their stool cultures. Stool samples were collected and assessment of *H. pylori* was done.

Results: Group I had 22 boys and 20 girls and group II had 18 boys and 24 girls. Shigella infection was seen in 17 in group I and 5 in group II, salmonella infection 25 in group I and 7 in group II. The difference was significant ($P < 0.05$). +ve stool antigen and -ve stool antigen with bottle feed was seen in 6 and 10, with breast feed in 10 and 6, with both bottle & breast feed was in 0 and 8, with mixed (milk+ solid) in 20 and 4 and with solid food in 18 and 2 respectively. The difference was significant ($P < 0.05$).

Conclusion: Helicobacter pylori (HP) is a gram-negative bacillus and one of the most common cause of diarrhoea in children.

Keywords: Children, diarrhoea, Helicobacter pylori

Introduction

Low gastric acid production has been found to be associated with an increased risk of enteric infection in developing countries. There is evidence that acute *H. pylori* infection causes hypochlorhydria in humans [1]. It is, therefore, possible that *H. pylori*-associated hypochlorhydria may lead to increased susceptibility to enteric pathogens. *H. pylori* has been shown to be associated with chronic diarrhoea and malnutrition [2].

H. pylori has been shown to play a major role in the pathogenesis of gastric atrophy, chronic diarrhea, and growth retardation in children, intestinal metaplasia, dysplasia, and the development of gastric carcinoma and lymphoma subsequently [3]. Besides, some benefits are also noted such as reducing prevalence of esophageal adenocarcinoma by decreasing the periods of gastroesophageal reflux disease. Fecal-oral or oral-oral routes are the main candidate ways of its transmission, although much is unknown in this regard [4].

There are arising theories of protective effect of *H. pylori* infection on diarrheal diseases, showing the low prevalence of diarrhea in children infected by *H. pylori*, although there is still a living debate about it. On the other hand, it has been shown that *H. pylori* infection is associated with Vibrio cholerae and Salmonella infection possibly through hypochlorhydria resulting from acute or chronic *H. pylori* infection [5]. The present study was conducted to assess *H. pylori* in children with diarrhoea.

Materials & Methods

The present study comprised of 84 children with acute bacterial gastroenteritis due to Salmonella or Shigella of both genders. The consent was obtained from all enrolled patients. Data such as name, age, gender etc. was recorded. 2 groups were formed. Group I were *H. pylori* with diarrhoea and group II were with no history of diarrhea and no bacterial growth in their stool cultures. Stool samples were collected and an assessment of *H. pylori* was done. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I: Distribution of patients

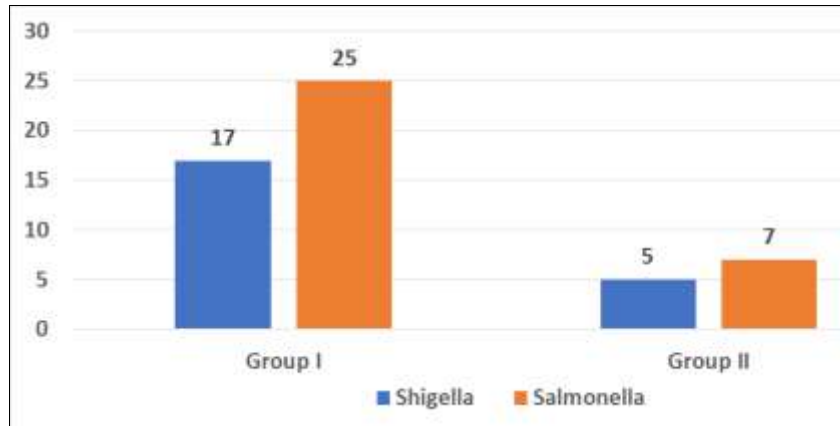
Groups	Group I	Group II
Status	Diarrhoea	No diarrhoea
M:F	22:20	18:24

Table I shows that group I had 22 boys and 20 girls and group II had 18 boys and 24 girls.

Table II: Type of infection in both groups

Type of infection	Group I	Group II	P value
Shigella	17	5	0.02
Salmonella	25	7	0.01

Table II, graph I shows that shigella infection was seen in 17 in group I and 5 in group II, salmonella infection 25 in group I and 7 in group II. The difference was significant ($P < 0.05$).



Graph I: Type of infection in both groups

Table III: Stool antigen based on the type of food

Type of food	+ve stool antigen	-ve stool antigen	P value
Bottle feed	6	10	0.05
Breast feed	10	6	0.05
Both bottle & breast feed	0	8	0.01
Mixed (milk+ solid)	20	4	0.03
Solid food	18	2	0.01
Total	54	30	

Table III shows that +ve stool antigen and -ve stool antigen with bottle feed was seen in 6 and 10, with breast feed in 10 and 6, with both bottle & breast feed was in 0 and 8, with mixed (milk+ solid) in 20 and 4 and with solid food in 18 and 2 respectively. The difference was significant ($P < 0.05$).

Discussion

Helicobacter pylori (*H. pylori*) is one of the most important factors in the gastroduodenal diseases [6]. The infection is most commonly acquired in early childhood and leads to chronic gastritis in both children and adults and is the leading cause of peptic ulcer disease in humans [7]. It is a challenging matter for many physicians due to lack of knowledge about its life cycle and low rate of bacterial eradication [8]. Gastroenteritis, especially bacterial gastroenteritis, mostly occurs in developing areas where *H. pylori* infection is more prevalent and it has been proposed that there may be a common route for both *H. pylori* and Shigella transmission by houseflies [9]. The present study was conducted to assess *H. pylori* in children with diarrhoea.

We found that group I had 22 boys and 20 girls and group II had 18 boys and 24 girls. Monajemzadeh M *et al.* [10] explored the prevalence of *H. pylori* infection in children with bacterial diarrhea and compare it with healthy controls. Two matched groups consisted of 122 consecutive children,

aged 24–72 months old, with acute bacterial diarrhea, who had Shigellosis ($N = 68$) and Salmonellosis ($N = 54$) as patients group and 204 healthy asymptomatic children as control group enrolled in this study. The prevalence of *H. pylori* infection in healthy control children was significantly higher than in patients group. Only 2/54 Salmonella infected patients and 3/68 of Shigellosis had evidence of *H. pylori* infection, while normal control children had 27/204 infected individuals.

We found that shigella infection was seen in 17 in group I and 5 in group II, salmonella infection 25 in group I and 7 in group II. Rahman *et al.* [11] in their study a cohort of 151 infants and young children aged 1-23 months from a poor peri-urban community of Bangladesh was studied to determine the relationship between Helicobacter pylori colonization and morbidity due to diarrhoea. A [13] C urea breath test was performed to detect the presence of *H. pylori*. Children were followed up at home every alternate day for 6 months and diarrhoeal morbidity data were collected. Diarrhoeal morbidity was compared between *H. pylori*-positive and *H. pylori*-negative children. Sixty-eight (45 %) children were *H. pylori* positive and 83 (55 %) were *H. pylori* negative. During the first 1-month period following the breath test, three (4.4 %) *H. pylori* positive and four (4.8 %) *H. pylori*-negative children had diarrhoea. Thirty-two (47 %) of the children in the positive group and 43 (52 %) in the negative group had one or more episodes of diarrhoea during the 6-month follow-up period. Median number of diarrhoeal episodes was 1.0 (range 1.0-4.0) in the *H. pylori*-positive children and 2.0 (range 1.0-5.0) in the *H. pylori*-negative children ($p = 0.19$). No significant difference was observed in the cumulative days with diarrhoea. The results of this study suggest that *H. pylori* colonization is not associated with diarrhoeal morbidity in infants and young children.

We found that +ve stool antigen and -ve stool antigen with

bottle feed was seen in 6 and 10, with breast feed in 10 and 6, with both bottle & breast feed was in 0 and 8, with mixed (milk+ solid) in 20 and 4 and with solid food in 18 and 2 respectively. Ibrahim *et al.* [12] determined the prevalence of *Helicobacter pylori* among children and to evaluate some epidemiologic characteristics. Total cases 120 (68 male, 52 female) presented with diarrhoea, their age range from birth to 6 years old. Stool samples were collected from each patient and send for *Helicobacter pylori* stool Antigen (HpSAg). Some relevant factors like sex, source of water, type of feeding, educational level of the mothers and fathers are studied. Among 120 total cases, 40.8% are positive for *H. pylori* stool Ag (HpSA), there is weak association between gender and HpSA presence, very strong association between source of water and HpSA presence, Moderate significant association between type of food and HpSA presence, no significant association between fathers and mothers education and HpSA presence.

Conclusion

Authors found that *Helicobacter pylori* (HP) is a gram-negative bacillus and one of the most common cause of diarrhoea in children.

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