

Association between Chronic Idiopathic Urticaria (CIU) and *H. Pylori* Infection: A Single Center Case-Control Study in Bangladesh

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Abstract

Introduction: Some studies have shown the possible involvement of *Helicobacter pylori* (*H. pylori*) infection in chronic idiopathic urticaria, but the relationship remains controversial. The aim of this study was to quantitatively assess the association between *H. pylori* infection and chronic idiopathic urticaria.

Material & Methods: A case-control type of analytical study was conducted in the department of Dermatology and Venereology, Naval Base Hospital (BNS Patenga), Chattogram, Bangladesh for duration of 06 months. Total 50 patients were enrolled in this study. 25 Patients of CIU with no identifiable cause were taken as case and patients without urticaria were taken as control, attending in the outpatient department. *H. pylori* infection was confirmed by Serum IgG for *H. pylori* test.

Results: The result shows that *Helicobacter pylori* significantly affect a high percentage of patients with chronic idiopathic urticaria and response to eradication therapy was evident in more patients in whom *H. pylori* were eradicated.

Conclusion: The study shows that *Helicobacter pylori* significantly affects a high percentage of patients with CIU. Response to eradication therapy was evident in more patients in whom *H. pylori* was eradicated while few patients showed no response despite eradication of *H. pylori*. The result of this study suggests that *H. pylori* infection should be included in diagnostic work up of patients with no response to usual treatment for CIU.

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Introduction

Chronic idiopathic urticaria (CIU) defined as the occurrence of daily or almost daily, wheals and itching for at least 6 weeks with no obvious cause. Hidden or overt bacterial, viral, fungal, and protozoan agents have been reported as possible initiating factors. But the etiology for most cases remains unknown and therapy is largely directed at symptomatic care. Up to 50% of the population show evidence of past or present *Helicobacter pylori* (*H. pylori*) infection and at least 30% of patients with CIU have infection with other organism. *H. pylori* colonizes the gastric mucosa and induces a strong inflammatory response with release of various bacterial and host- dependent cytotoxic substances.¹ It is definitely the etiopathogenesis of gastrointestinal disorders, such as gastritis, peptic ulcer, gastric carcinoma,

and lymphoma.² Recent epidemiological and experimental data have pointed to a strong relation of *H. pylori* infection with the development of many extra gastric diseases, such as cardiovascular, immunologic, and some skin diseases.³ Despite numerous studies, the role of *H. pylori* in chronic urticaria is still a challenge for researchers and pathogenic mechanisms are not fully understood resulting in several hypotheses.^{4,5}

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Autoimmune mechanism and in some cases, specific IgE antibodies have been described for *H. pylori* antigens, both in patients with chronic urticaria and in patients with complete remission after eradication of *H. pylori* infection.^{6,7}

In addition, it was demonstrated that *H. pylori* can increase serum and tissue levels of nitrous oxide (NO), a free radical which plays an important role in inflammation and immunomodulation.⁸ Some studies have found a link between *H. pylori* infection and CIU.⁹⁻¹¹ Other studies, however, disagree with these findings and have found that *H. pylori* prevalence does not differ from that of control groups.^{12,13} Based on current understanding of CIU and *H. pylori*, current study has conducted to further investigate the possible association. The existence of a correlation between *H. pylori* and CIU may help clinician to find more effective methods to treat people with CIU. Moreover it will provide the base line information to the researcher for further study.

Materials and Methods

This case-control type of analytical study was conducted among 50 purposively selected patients attending in the Dermatology & Venereology outpatient department (OPD) at BNS Patenga, Chattogram, Bangladesh from November 2020 to April 2021 (six months). Twenty five patients of CIU with no identifiable cause was taken as case and 25 age and sex matched patients without urticaria attended OPD for other reasons was taken as control for this study. Only adult (age between 18-60 years), clinically diagnosed case of CIU were enrolled. Patients with pregnancy, food allergy, medications, connective tissue and thyroid diseases, malignancies, receiving corticosteroids, immunosuppressive therapy or renal replacement therapy, ASST (+), and unwilling to give informed consent were excluded from the study.

The investigations method includes questionnaire, clinical evaluation and laboratory methods. Complete blood count, total eosinophil count, serum IgG for *H. pylori*, urine routine examination, liver function test, serum test for hepatitis B and C, stool for parasites and ova, total IgE and investigation for focus of infection were carried out. *H. pylori* IgG positive cases were treated with oral 30 mg lansoprazole, 1 gm amoxicillin, and 500 mg clarithromycin twice daily for 14 days and symptom of CIU along with adverse effects drugs were observed for 12 weeks. Data analysis was performed by Statistical Package for Social Science (SPSS). Categorical variables were summarized as percentages, and continuous variables were expressed as the mean \pm standard deviation. Level of significance was measured by using chi-square test (χ^2), t-test, F test (ANOVA) for categorical variables and nonparametric Kruskal-Wallis test for continuous variables where applicable. Level of significance (p value) was set at 0.05. Ethical clearance was obtained from ethical clearance committee headed by commanding officer of BNS Patenga, Chattogram.

(Note: Sensitivity & Specificity of the IgE of IgG is not mentioned. It is also need to mention the comparison of Gold standard *H. Pylori* to IgG)

Results

Table 1: Distribution of patients according to sex (n=50)

Sex	Group		P value
	Case(A)	Control (B)	
Male	10 (40%)	15 (60%)	0.157
Female	15 (60%)	10 (40%)	
Total	25 (100%)	25 (100%)	

*Chi-square test was done to measure the level of significance.

Table 1 shows the distribution of patients according to sex. The difference between these two group is not statistically significant (P=0.157).

Table 2: Distribution of patients according to age group (n=50)

Age group	Group		P value
	Case (A)	Control (B)	
<20	1 (4%)	3 (12%)	0.053
21-30	5 (20%)	7 (28%)	
31-40	10 (40%)	12 (48%)	
41-50	5 (20%)	1 (4%)	
>50	4 (16%)	2 (8%)	
Total	25 (100%)	25 (100%)	
Mean± SD	38.96 ± 10.632	33.00 ± 10.607	

*t test was done to measure the level of significance.

Table-2 shows difference between group A and B is not statistically significant (P=0.053).

Table 3: Distribution of patients according to occupation (n=50)

Occupation	Group		P value
	Case(A)	Control (B)	
Military personnel	6 (24%)	11 (44%)	0.236
Housewife	14 (56%)	8 (32%)	
Student	1 (4%)	3(12%)	
Civil employee	4(16%)	3(12%)	
Total	25(100%)	25(100%)	

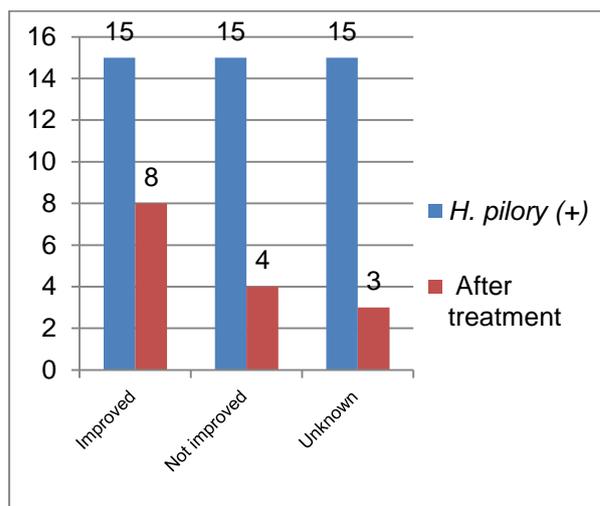
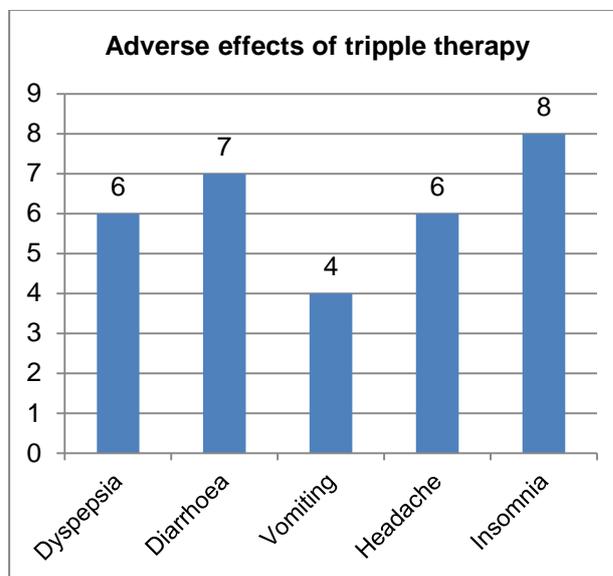
*Chi-square test was done to measure the level of significance.

Table- 3 shows the distribution of patient according to occupation. The difference between group A and group B are not statistically significant (P=0.236).

Table 4: Distribution of patients according to Serum IgG for *H. Pylori* (n=50)

Serum IgG for <i>H. pylori</i>	Group		P value
	Case(A)	Control (B)	
Positive	15 (60%)	8 (32%)	0.047
Negative	10 (40%)	17 (68%)	
Total	25 (100%)	25 (100%)	

Table-4 shows the distribution of patient according to *H. pylori* status. The difference between group A and group B are statistically significant (P=0.047)

Figure 1: Bar diagram showing result after triple therapy (n=15)**Figure-2: Bar diagram showing adverse effect of triple therapy (n=15)**

Discussion

In our study male to female ratio was 1:1.5 whereas the renowned study of Kanokvalai *et al* showed 1:4.¹⁴ In group B male is predominant than female which is 15 (60.0%) and 10 (40.0%) cases respectively. The difference between these two group is statistically significant (p=0.047). Distribution of sex for positivity of IgG for *H. Pylori*, male respondents were more positive (8 persons with 53.3%) than female respondents (7 respondents with 46.7%). Among the 10 negative

results, 8 respondents (80%) were female and 2 respondents (20%) were males. Regarding age the Mean \pm SD of group A and group B are in 38.96 ± 10.632 and 33.00 ± 10.607 years respectively which was not statistically significant ($P=0.053$).

When we searched the positivity for IgG levels to detect *H. Pylori*, it was found that, in case of serum IgG positive respondents, male respondents were greater than the female counterparts. But the result was not significant. In group A majority are housewives which is 14 (56%) cases followed by military personnel, civil employee and student which are 6 (24%) cases, 4 (16%) cases, and 1 (4%) case respectively. In group B majority are military personnel which is 11 (44%) cases followed by housewife, student and civil employee which are 8 (32%) cases, 3 (12%) cases and 3 (12%) cases respectively. The difference between group A and group B are not statistically significant ($P=0.236$).

When we searched the positivity for IgG levels to detect *H. Pylori*, it was found that, in case of serum IgG positive respondents, male respondents were greater than the female counterparts. But the result was not significant. In group A majority are housewives which is 14 (56%) cases followed by military personnel, civil employee and student which are 6 (24%) cases, 4 (16%) cases, and 1 (4%) case respectively. In group B majority are military personnel which is 11 (44%) cases followed by housewife, student and civil employee which are 8 (32%) cases, 3 (12%) cases and 3 (12%) cases respectively. The difference between group A and group B are not statistically significant ($P=0.236$). To know the incidence of serum IgG for *H. Pylori* amongst the different occupation of the respondents, it was seen that the Housewives and military personnel have the highest percentage (40%) of positive serum IgG. In the research work of Tachihara RT,

et al describes the house wives gave the incidence of 20% only.¹⁵

One of our important diagnostic tools was to see the IgG level in serum to detect *H. Pylori* infestation among the patients, so this distribution of patients according to Serum IgG for *H. pylori* shows that about 60% cases (15 respondents) were positive for IgG and 10 patients (40%) were negative. On the contrary, among the controls, 32% (8 respondents were positive and 68% (17 respondent) were negative for IgG. So the result was significant ($P=0.047$). Gaiga, P. *et al.* suggests that 80% CIU cases were positive with *H. Pylori* infestation.¹⁶

Among the cases highest number were found aged (> 41years) about 40% followed by middle aged (21 - 30 years) about 20%. Bonamigo RR *et al.* had a research that showed young aged (20-30 years) females had higher affection of *H. Pylori* (43.4%).¹⁷

15 patients with positive *H. Pylori* antibodies received triple therapy. Patients were evaluated for the relief of symptoms. Eradication therapy was successful in 8(66.67%) patients, 4(33.33%) patients did not respond to therapy and 3 patients could not complete the study. As the findings suggest that anti. *H. Pylori* triple therapy is significantly effective in the treatment of CIU. A study also have shown there is a possible role of *H. Pylori* infection in the pathogenesis of CIU which is consistent with our study. Limitations of this study was Urea breath test (UBT) & *H. Pylori* stool antigen test (HpSAT) cannot be performed which have higher accuracy than serum for *H. Pylori* IgG antibody test.

Conclusion:

The study shows that *Helicobacter pylori* affects a high percentage of patients with chronic idiopathic urticaria. Response to eradication therapy was evident in more patients in whom *H. pylori* was eradicated while few patients showed

no response. The result of our study suggests that *H. pylori* infection should be included in diagnostic work up of patients with no response to usual treatment for CIU. Further large scale investigation regarding the involvement of *H. pylori* infection related to CIU should be carried out for effective management and improve the quality of life of such patients.

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