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Prevalence of *Helicobacter pylori* infection in adult immune thrombocytopenia patients

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ABSTRACT

Background: *Helicobacter pylori* is a Gram-negative, microaerophilic bacteria colonizing more than half of the world's human stomachs. It is the causal agent of active chronic gastritis and the most common cause of peptic ulceration, including gastric and duodenal ulcers. **Aims and Objectives:** This study aims to the prevalence of *H. pylori* infection in adult immune thrombocytopenia (ITP) patients. **Materials and Methods:** An interventional and prospective study was conducted over 6 months with over 50 ITP patients, including those admitted to the general medicine ward and those in regular follow-up in medicine outpatient department. In addition, in all primary ITP patients, a stool antigen test for *H. pylori* Ag and baseline complete blood count, including platelet count, were done. In addition, all patients' platelet count was monitored twice weekly for 6 months. **Results:** Of the 50 patients, 40 are female and 10 are male. The bleeding manifestation was present in 34 patients (68%) and absent in 16 (32%). Among 34 patients, purpura was more frequent (35.3%), followed by gum bleeding 17.6%. Fourteen people tested positive for the *H. pylori* antigen. Thirty-six patients were found to be *H. pylori* antigen negative. *H. pylori* positive frequency was 28%. Patients who receive both steroids and an *H. pylori* regimen are 9 (18%). Patients who received the *H. pylori* regimen were only 5 (10%). Patients only receiving steroid doses are 27 (54%). **Conclusion:** We conclude that 28% of our study patients are infected with *H. pylori*, and eradicating this organism significantly improves the platelet count. However, a more extended follow-up period is needed to detect the true prevalence of *H. pylori* infection and the duration of remission.

Key words: *Helicobacter pylori*; Purpura; Immune thrombocytopenia

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INTRODUCTION

Idiopathic thrombocytopenic purpura (ITP) is an immune-mediated disease that makes a temporary or permanent reduction in platelet count in adults and children. Thrombocytopenia is associated with an increased risk of bleeding. Primary ITP is defined as ITP that arises without an obvious predisposing etiology, and secondary ITP is defined as ITP that occurs due to a recognized cause. It is also necessary to rule out pseudothrombocytopenia.[1,2]

The adult rate of ITP has been reported to be between 1 and 4/100,000 people, with no evident seasonal fluctuation. The yearly causes of ITP were determined to be 2.25/100,000 and 1.6/100,000 using a cut-off platelet count of $<50\times10^9$/L. Surprisingly, the average age of patients due to ITP diagnosis (56 years) was the same in both trials.[3] According to data from the World Health Organization, the incidence rate of ITP is between 6.0 and 10/100,000 people. More recently, epidemiological research reported the age-adjusted frequency to be 9.5/100 000 people.[4]

Helicobacter pylori is a negative bacterium first discovered in 1982 and found worldwide. Throughout their lives, it colonizes the stomachs of almost half of the world's human population. *H. pylori* is the primary cause of gastritis in most peptic ulcer patients. It also contributes to the growth of stomach adenocarcinoma and mucosa-associated lymphoid tissue. It is also been linked to autoimmune disorders such as autoimmune thyroid disease, rheumatoid arthritis, and

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ITs etiology. A recent study discovered a considerable prevalence of *H. pylori* infection in ITP patients, with most instances responding well to bacterial eradication.[5]

Research conducted in Italy in 1998 was the first to connect *H. pylori* with ITP. However, later investigations have yielded contradictory results. For instance, the correlation between *H. pylori* and ITP is 70% and 50%, respectively, in regions with a high prevalence of the bacterium. In areas with a low *H. pylori* incidence, the link was just 22%. This meant that the rate of *H. pylori* infection in ITP patients was comparable to that found in the general population. Furthermore, studies, where *H. pylori* was prevalent, found no significant changes in platelet count following eradication medication.[6]

The connection between *H. pylori* and ITP is currently being debated. Furthermore, it is uncertain if *H. pylori* is a secondary cause of ITP or simply a different, extra, or coincidental discovery in ITP patients. Various research has indicated all of these options.[7] This study aims to evaluate the incidence of *H. pylori* in our hospital's idiopathic thrombocytopenia (ITP) patients and the impact of eradication on the platelet count of adult ITP patients.

Aims and objectives

The aims and objectives of the study are to assess the prevalence of *H. pylori* infection in adults with ITP and the effect of *H. pylori* eradication therapy on platelet count recovery in adults with ITP which were the focus of this investigation.

MATERIALS AND METHODS

An interventional and prospective study was conducted in the General Medicine Department of Madurai Medical College in collaboration with the Department of Biochemistry over 6 months with over 50 ITP patients, including those admitted to the General Medicine Ward and those in regular follow-up in Medicine Outpatient Department. Informed written consent was obtained.

Inclusion criteria

The inclusion criteria for this study are patients diagnosed with Idiopathic Thrombocytopenic Purpura (ITP) after ruling out secondary causes, and having a platelet count of <1 lakh per microliter.

Exclusion criteria

Pseudothrombocytopenia, patients with HIV, HEP-C, HEP-B positive, SLE, lymphoproliferative disorders, drug-induced thrombocytopenia, chronic liver disease chronic kidney disease, pregnant women, patients with <12 years of age, patients with a family history of inherited thrombocytopenic disorders, patients taking any antibiotics, proton-pump inhibitors, H2 blockers in a past 4 weeks, patients had participated in the *H. pylori* eradication program previously. The following investigations were done in those 50 ITP patients complete blood count, peripheral smear study, immature platelet fraction, blood grouping and typing, direct Coombs test, ANA, LDH, VCTC/viral markers (hepatitis C virus and hepatitis B surface antigen), ultrasonography abdomen and pelvis, renal function test/liver function test, coagulation profile, and stool antigen test for *H. pylori*.

Statistical methods

The data were statistically analyzed using the SPSS software. In addition, many tests and methodologies were analyzed.

RESULTS

Of the 50 patients, most of the age group were 31–40 years (48%). Forty are female, and ten are male. The female-to-male ratio was 4:1. Females experienced ITP at a higher rate (80%) than males (20%). The bleeding manifestation was present in 34 patients (68%) and absent in 16 (32%). Platelet transfusion was given in those with bleeding manifestation (n - 34, percentage - 68%) to improve platelet count quickly and prevent major complications. In stool antigen tests among 50 ITP patients, 14 are *H. pylori* antigen positive. Thirty-six patients were shown to be *H. pylori* antigen negative, and the ratio was around 1:3. *H. pylori*-positive frequency was 28%. 6 ITP patients in our study maintained a partial response (12%), and 8 patients had a complete response (16%) (Table 1).

Among 34 patients, purpura was more frequent (35.3%), followed by gum bleeding (17.6%). None of the patient's present life-threatening manifestations, including major intracranial, upper gastrointestinal, and intraocular bleeding (Table 2).

Patients who receive both steroids and an *H. pylori* regimen are 9 (18%). Patients who received the *H. pylori* regimen were only 5 (10%). Patients only receiving steroid doses are 27 (54%). Nine patients are not receiving any form of therapeutical intervention other than frequent platelet monitoring. The frequency was 18%. In a twice-weekly follow-up, none of the patients had bleeding manifestations. Patients with a platelet count of <30,000 cells/cubic millimeter are treated with a weight-based steroid dose (Tables 3 and 4).

There is a significance (P=0.015 in partial remission), and in complete remission, which is insignificant (P=0.875).

DISCUSSION

We analyzed their clinical profiles to identify adult ITP patients with *H. pylori* and performed stool antigen tests.

At the same time, we eradicate that organism with drugs and observe the platelet count for the remission of ITP over 6 months. There are 40 female patients and 10 male patients among the 50. Females experienced ITP at a higher rate (80%) than males (20%). Among the 50 patients with ITP, majority were in the third to fifth decade (41). The third to fourth decade is 24 patients (48%), and the fourth to fifth decade is 17 (34%). The mean age of ITP was 39.6 years. The bleeding manifestation was present in 34 patients (68%) and absent in 16 (32%).

Among 34 patients, purpura was more frequent (35.3%), followed by gum bleeding 17.6%. None of the patient's present life-threatening manifestations, including major intracranial, upper gastrointestinal, and intraocular bleeding. Platelet transfusion was given in those with bleeding manifestation (n - 34, percentage - 68%) to improve platelet count quickly and prevent major complications.

In stool antigen tests, among 50 ITP patients, 14 are *H. pylori* antigen positive. Thirty-six patients were found to be *H. pylori* antigen negative, and the ratio was around 1:3. *H. pylori* positive frequency was 28%. Patients who receive both steroids and an *H. pylori* regimen are 9 (18%). Patients who received the *H. pylori* regimen were only 5 (10%). Patients only receiving steroid doses are 27 (54%). Nine patients are not receiving any form of therapeutical intervention other than frequent platelet monitoring. The frequency was 18%. In a twice-weekly follow-up, none of the patients had bleeding manifestations.

Patients with a platelet count of <30,000 cells/cubic millimeter are treated with a weight-based steroid dose. No response in our study means that the follow-up platelet count fails to rise above 50,000 cells/cubic millimeter. In this study, 36 patients' platelet counts failed to rise above 50,000 despite treatment (72%). On the other hand, 6 ITP patients in our study achieved and maintained partial response (16%). The complete response in our study means that platelet count reached above 1.5 lakh/cubic millimeter. Eight patients in our study achieved and maintained complete responses (16%). Among eight patients, all received *H. pylori* eradication treatment for 14 days.

Inaba et al.,[8] observed similar findings. In 11 (44%) of the 25 patients cured of *H. pylori* infection, platelet counts increased by more than 100×10^9/L, and *H. pylori* eradication was significantly related to platelet recovery (P=0105). Medication to eradicate *H. pylori* increased platelet counts.

There was a significant rise in platelet count 1 month following eradication therapy in the majority of responders, and this increase persisted without ITP treatment for over a year, as reported by Fujimura et al.,[9] Full and partial remission rates in *H. pylori*-positive individuals were 23% and 42%, respectively, in the successful group.

Lee et al.,[10] found that the frequency of *H. pylori* infection was 54.3% (75/138), with a 71.4% success rate with first-

Table 1: Frequency distribution of age, gender, bleeding manifestation, platelet transfusion, *H. pylori* stool antigen test, and outcome

Variable	n	%
Age		
20–30 years	6	12
31–40 years	24	48
41–50 years	17	34
51–60 years	3	6
Gender		
Female	40	80
Male	10	20
Bleeding manifestation		
Present	34	68
Platelet transfusion		
Yes	34	68
H. pylori stool antigen test		
Positive	14	28
Negative	36	72
Outcome		
No remission	36	72
Partial response	6	12
Complete response	8	16

H. pylori: Helicobacter pylori

Table 2: Frequency distribution of type of bleeding manifestation

Variable	n	%
Type of bleeding manifestation		
Epistaxis	4	11.8
Gum bleeding	6	17.6
Menorrhagia	4	11.8
Purpura	12	35.3
Epistaxis+gum bleeding	1	2.9
Epistaxis+purpura	1	2.9
Gum bleeding+menorrhagia	2	5.9
Gum bleeding+purpura	1	2.9
Menorrhagia+purpura	3	8.8

Table 3: Frequency distribution of type of management

Management type (groups)	n	%
Stool *H. pylori* antigen positive		
Platelet <30,000/cc		
HPR+Steroids	9	18
Platelet ≥30,000/cc		
HPR	5	10
Stool *H. pylori* antigen negative		
Platelet <30,000/cc		
Steroid	27	54
Platelet ≥30,000/cc		
Observation	9	18

Table 4: Description of partial remission and complete remission

Parameters	Week of partial response	P-value	Week of complete response	P-value
Observation (n=9)				
Mean	0		0	0.875
SD	0		0	
Steroid (n=27)				
Mean	0	0.015*	0	
SD	0		0	
HPR (n=5)				
Mean	4.4		18.6	
SD	1.6		2.3	
HPR+Steroid (n=9)				
Mean	8.2		18.4	
SD	2.7		2.2	

line treatment (35/49). In addition, patients who obtained a CR at 2 months had a greater platelet count after that.

19 of 30 ITP patients (63.3%) were found to have *H. pylori* infection, which is significantly higher than the prevalence among controls (13/30, or 43.3%), as reported by Shaikh et al.,[11] Assessment of the odds ratio yielded a value of 2.25, suggesting a statistically significant correlation between *H. pylori* infection and ITP.

Stasi et al.,[12] studied the platelet responses found in 17 (33%) individuals, with 11 patients experiencing them for more than a year. Responders had a shorter ITP duration than non-responders. Only one response was found among individuals with symptomatic thrombocytopenia (platelet count 30×10^9/L).

Limitations of the study

The limitations of this study include a small sample size, selection bias, lack of a control group, short follow-up period, and limited generalizability. Further research is needed to address these limitations and provide more robust evidence on the relationship between *H. pylori* infection and platelet count in ITP patients.

CONCLUSION

We find that *H. pylori* infection affects 28% of our study patients. Complete eradication of this organism significantly improves the platelet count. Although the prevalence of *H. pylori* infection was low, eradicating this organism can lead to the early achievement of complete remission of ITP. Further studies are needed on many patients, and a more extended follow-up period is needed to determine the incidence of *H. pylori* infection and the period of remission.

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