

Is There a Relationship Between Helicobacter Pylori Eradication and Blood Group?

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ABSTRACT

Although there is an association between Helicobacter Pylori (HP) infection and blood group, the effect of blood groups on HP eradication is not yet known. Our aim in the study was to investigate the relationship between blood group and other risk factors with HP eradication after HP eradication therapy.

104 patients who underwent gastrointestinal system endoscopy and received gastric tissue biopsies were enrolled in the study at our hospital between June 2017-December 2018. Demographic and histopathological data of all patients were documented. HP eradication was performed by giving Amoxicillin and Clarithromycin and Pantoprazole treatment to all patients. Patients were divided into two groups according to HP eradication. The relationship between HP eradication rate and blood groups and risk factors was analyzed.

A total of 104 HP positivity was included in the study. The mean age of the patients was 47.7 ± 14.6 years old. Fifty-two (50%) patients were women, the body mass index (BMI) was 27.6 ± 4.7 (range:17.7-42.1). The distribution of blood groups were 49(47.1%) A, 13(12.5%) B, 9(8.7%) O, 33(31.7%) AB. HP eradication occurred in 70 (67.3%) patients after HP treatment. HP eradication rate was significantly higher in women, but there was no significant relation between HP eradication and age, BMI or blood groups.

In conclusion, while there was a significant relationship between gender and HP eradication, no significant relationship was observed between ABO blood groups and HP eradication.

Key Words: Helicobacter Pylori, Blood Group, Eradication

Introduction

Helicobacter pylori (HP) is a gram-negative spiral-shaped pathogenic bacterium that is closely related to gastric mucosa irritation and inflammation, gastric ulcer, gastric cancer and gastric lymphoma (Mucosa associated lymphoid tissue lymphoma) (1,2). About half of the world's population is infected with this bacterium which makes HP infection a major health problem (2,3,4). It is transmitted fecal-orally route (2,3,4). In addition to gastrointestinal diseases, HP infection has been shown to be associated with many diseases such as idiopathic thrombocytopenic purpura, iron deficiency anemia, diabetes mellitus, Parkinson's disease and coronary artery disease (5,6,7). Since HP eradication therapy is beneficial for all these diseases, it is recommended to all patients with HP infection (5,7).

HP infection varies geographically. The prevalence, is lower in developed countries (25-30%), than in developing countries (70-90%) (8). The parameters such as gender, socioeconomic level, life styles, over crowding, smoking and alcohol change HP infection rates at different regions of same country (1,2,9). In addition to these parameters, HP infection reported to rates vary according to blood groups (2,3). ABO and Rh classification is the most clinically important classification system especially for blood transfusion and it is based on antigens consisting of protein, glycoprotein and glycolipids in erythrocyte membrane. Four major blood groups, A, B, AB and O, have been identified with antigen-antibody methods (4). Studies has been confirmed that certain diseases are more common in different blood groups (10). Similarly it has been noted that the O blood group tends to have

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higher HP infections than other groups (10). In the same way, there are many factors that play an important role in HP eradication. Although, age, sex, smoking and alcohol use and prior eradication have shown to play a significant role in HP eradication (5,11,12). The relationship between blood type and HP eradication has not been investigated. This study, aimed to evaluate the relation between eradication success and blood groups as well as other factors.

Materials and Methods

Study Design: Between June - 2017 and December - 2018, 104 patients who applied with dyspeptic complaints and found to be HP positive by upper gastrointestinal system (GIS) endoscopy and gastric tissue biopsies at our Gastroenterology endoscopy unit, were prospectively included to the study. Patients were 19-86 years old volunteered to participate and to under upper GIS endoscopy. Patients with chronic disease history previous (in) complete HP eradication, and antibiotic and/or proton pump inhibitor (PPI) use, until one month before the study excluded from the study.

Data Evaluation: Demographic data of all patients were collected from hospital documents. Serum samples from all patients were analyzed for blood groups by slide agglutination test method using anti-A, anti-B, anti-AB, monoclonal antibodies.

Endoscopic Evaluation: The endoscopies of the patients were performed by using the Fujinon EG530WR endoscopy device. Oral and written consent was obtained before endoscopy. All patients were fasted for 6 hours before endoscopy. After local pharyngeal xylocain anesthesia, patients were sedated with 0.1 mg/kg of midazolam and 1 mg/kg of ketamine during endoscopic evaluations, the appearance of gastric mucosa, bulbus and duodenum, presence of ulcers, and endoscopic diagnoses were recorded.

Histopathologic Evaluation: The corpus and antrum biopsies taken endoscopically were sent to the pathology within 10% formaldehyde. After routine tissue processing tissue samples were embedded into paraffin were cut into 5 micron thickness, stained with routine Hematoxylin-eosin (H-E), and evaluated under a light microscope. Modified Giemsa stain was used to assess HP presence. Biopsies were reported according to the updated Sydney classification (inflammation, activation, dysplasia, intestinal metaplasia, atrophy and HP intensity) (13).

HP Eradication Therapy: All patients were given Amoxicillin (1000 mg twice daily) and Clarithromycin (500 mg twice daily) and Pantoprazole (40 mg twice daily) for 14 days. Subsequently, Pantoprazole (40 mg once daily) treatment was continued for 14 days. HP eradication was evaluated by stool HP antigen test in all patients two months after the end of treatment (14,15).

Statistical Analysis: The results were analyzed by the Statistical Package for the Social Sciences 24.0 (SPSS) program. Continuous values were given as mean \pm standard deviation, categorical data as percentage. The data with normal distribution were tested with Kolmogorov-smirnov test, Mann-Whitney U test and chi-square test were used for non-parametric data and categorical data testing respectively. $P < 0.05$ was considered statistically significant.

Results

A total of 104 HP positive patients were included into the study. The age was 47.7 ± 14.6 (range:19-86) years. Fifty two (50%) of all patients were women. Weight, height and body mass index (BMI) were 76.1 ± 14.2 (48-130), 165.7 ± 8.6 (149-189) and 27.6 ± 4.7 (17.7-42.1) respectively. 36 (34.6%) of the all patients were smoking and 3 (2.9%) of the all patients were using alcohol. The proportions A, B, AB and O blood groups were respectively; 49 (47.1%), 13 (12.5%), 9 (8.7%), 33 (31.7%).

HP eradication was successful in 70 (67.3%) and failed in 34 (32.7%) of patients. There no statistically significant difference between groups for age, weight, height, BMI, and alcohol use except that eradication group was younger. In addition, HP eradication success was significantly higher in women. 76.9% of women vs. 57.7% ($p < 0.05$). Smoking rate was significantly higher in the HP Eradication Failed group ($p > 0.05$). The comparison between blood group and HP eradication success showed no significant relation between blood groups and eradication success ($p > 0.05$) (Table 1).

Discussion

HP infection is a major health problem. It is known that it can cause a clinical antithesis that can progress to gastric cancer and lymphoma (8,9). Therefore, HP eradication becomes important. Besides the medical treatments used,

Table 1. Distributions Blood Groups and Other Parameters According to Helicobacter Pylori Eradication Status

Variables	HP Eradicated	HP Eradication Failed	Total	P value
	70 (%67.3)	34 (%32.7)	104 (%100)	
	Mean ± Sd	Mean ± Sd	Mean ± Sd	
Age (years)	47.06±13.1	49.06±16.1	47.7±14.6	0.516
Weight (kilogram)	74.37±12.1	79.71±17.3	76.1±14.2	0.069
Height (centimeter)	164.6±8.1	168.1±9.3	165.7±8.6	0.063
BMI (kg/m2)	27.4±3.9	28.2±6.1	27.6±4.7	0.398
Sex n(%)				0.037*
Female	40 (76.9)	12 (23.1)	52 (50)	
Male	30 (57.7)	22 (42.3)	52 (50)	
Smoking				0.022*
Yes	19 (27.1%)	17 (50%)	36 (34.6%)	
No	51 (72.9%)	17 (50%)	68 (65.4%)	
Alcohol use				0.981
Yes	2 (2.9%)	1 (3.0%)	3 (2.9%)	
No	68 (97.1%)	33 (97.0%)	101 (97.1%)	
Blood groups n(%)				
A	36 (73.5)	13 (26.5)	49 (100)	0.206
B	7 (53.8)	6 (46.2)	13 (100)	0.269
O	7 (77.8)	2 (22.2)	9 (100)	0.321
AB	20 (60.6)	13 (39.4)	33 (100)	0.484

there are many individual and social factors that play a role in eradication (16,17).

Although there are conflicting data in the studies on the factors affecting HP eradication, many factors such as age and gender in eradication, dietary habits, smoking and alcohol use, drug combinations used, patient compliance, drug side effects and tolerability have been investigated (5,17,18). In the study conducted by Yokoto et al, it was reported that HP eradication rate was significantly lower in the elderly (5). This has been shown to be less in patients' compliance with HP eradication therapy due to many cognitive disorders accompanying the elderly and multiple drug use. However, in a study conducted in Japan, it was reported that treatment compliance was better in elderly patients and that HP eradication rate was significantly higher (19). In their study, Gebeyehu et al has been shown to have an important role in HP eradication in rural life, educational status and side effects of medications. However, it has been reported that age and gender do not play a role in HP eradication (16). Similar studies have shown that there are different gender-related results (20,21). In our study, while HP eradication rate was higher in young people, there was no statistically significant relationship

between them, while it was shown that HP eradication was higher in women.

In studies examining the relationship between HP and blood group, ABO blood group antigens have been shown to provide resistance advantage against some infectious diseases (22). Aspholm-Hurtig et al reported that the Lewis B antigen acts as a receptor that helps microbial adhesion to the gastric epithelium and increases bacterial colonization for H. pylori binding (23). HP is located in the gastric mucosa by binding to the blood group antigen named Lewis B. Lewis B antigen is also at higher levels in the O blood group (24,25). This explains why HP rates are higher in the O blood group. In addition, individuals with O blood groups have been reported to have higher inflammatory responses to epithelial cells colonization density and individuals with other blood groups to H. pylori infection. In the same study, it was noted that increased inflammatory response contributed to the increased sensitivity of O blood group individuals to peptic ulceration (26). Although there are many studies analyzing the relationship between HP and blood group, the role of blood groups in HP eradication is not yet known (22-26). In our study, which analyzed the relationship between HP

eradication and blood group, no significant relationship was detected between blood groups.

In our study, there are strengths besides some limitations. Limitations are limited number of patients and retrospective study. In addition, since our study was conducted retrospectively, we could not find information about some factors that might affect HP eradication therapy, such as smoking, alcohol. However, histopathological presentation of HP is important because of its high sensitivity, specificity and its ability to clarify a subject that is not clearly available in the literature are the strengths of our study.

In conclusion, as a result, in our study, while HP eradication rate was higher in young people and women, no relation was found with the blood group. For this reason, it is important to monitor the elderly and male patients more closely and ensure compliance. In addition, prospective designed studies with high sample size are needed to clarify the relationship between blood group and HP eradication.

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