



# Relationship Between *Helicobacter pylori* and Blood Groups

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## Abstract

**Aim:** It was aimed to see the relationship between *Helicobacter pylori* (*H. pylori*), a bacterium that settles in various parts of the stomach and duodenum, and blood groups and its distribution among blood groups.

**Material and Method:** A retrospective analysis was conducted on 285 patients who underwent *H. pylori* testing between 2020 and 2022. Data on patients' age, sex, *H. pylori* test results, and blood types were collected. Student's t-test was used for age comparisons and chi-square was used for gender distribution. Blood group distributions were expressed as percentages.

**Results:** In the study, it was determined that 70% of *H. pylori* positive patients were female and 30% were male. The *H. pylori* negative individuals were reported as 21.4% male and 78.6% female and no significant difference was found in terms of gender. When age groups were analysed, *H. pylori* positive patients were found to be 53.5±15.8 years old and negative patients were found to be 52.4±15.8 years old and no significance was found ( $p=0.57$ ). Among the patients with *H. pylori*, 10.9% were in group AB, 13.6% in group B, 37.3% in group O and 38.2% in group A. Furthermore, there is no significant distinction between negative patients and the opposite groups ( $p=0.242$ ).

**Conclusion:** The findings suggest that *H. pylori* infection is more frequently observed in individuals with blood groups A and O, indicating that these blood types may be associated with a higher susceptibility to the infection.

**Keywords:** *H. pylori*, blood groups, blood group A, blood group O

## INTRODUCTION

*Helicobacter pylori* (*H. pylori*) is a notable stomach pathogen, characterized by its S-shaped, short spiral, or gull-wing morphology. It is a motile, non-spore-forming, capsule-free, microaerophilic, Gram-negative bacillus. Scientific studies have proven that *H. pylori* infection is associated with many serious gastric diseases ranging from duodenal ulcer to gastric adenocarcinoma (1).

*H. pylori* infections are generally contracted throughout childhood, with many strains potentially colonizing the stomach during this time. Children of infected mothers are approximately five times more likely to get *H. pylori* infections than those of uninfected mothers, with familial transmission, especially from mother to child, being prevalent (2).

*H. pylori*, a pathogen particular to humans, can be transferred by fecal contact, contaminated food and

water, saliva, or medical devices utilized in endoscopic procedures. Ongoing colonization in dental plaques is seen as a source of endogenous infection (3). About half of the world's population is infected with *H. pylori*. The prevalence ranges from 70% to 90% in impoverished nations and from 25% to 50% in developed countries (4).

A study in Brazil revealed a correlation between ABO blood groups and infections from Gram-negative bacilli in patients having upper gastrointestinal endoscopy (5). Although certain investigations indicated no correlation between blood groups and *H. pylori*, new study has demonstrated that persons with blood group O exhibit increased susceptibility to *H. pylori* colonization in the stomach epithelium (6).

In this study, we aimed to determine the possible distribution between *H. pylori* infection and blood groups and which blood group is more common.

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MATERIAL AND METHOD

Ethical approval was secured from the Ordu University ethics committee prior to the commencement of the project. A retrospective review was conducted on patients who had *H. pylori* testing from 2020 to 2022. The study comprised 285 patients with both *H. pylori* test findings and documented blood group information.

The patients' age, gender, chronic disease history, *H. pylori* test outcomes, and blood group information were documented. Patients with solely blood group data or alone *H. pylori* test findings were excluded from the analysis. Group comparisons were conducted with Student's T-test and the chi-square test. Numerical data were presented as mean  $\pm$  standard deviation (SD), while categorical variables were represented as percentages.

This study was approved by Ordu University Clinical

Research Ethics Committee with decision number 107 on 14.04.2023.

RESULTS

The study included 285 patients and 38% (110) of them were found to be positive for *H. pylori*. Of the positive patients, 70% (77) were reported as female and 30% (33) were reported as male. Among the negative patients, 78.6% women and 21.4% men were found to be negative and no significant difference was found between gender and *H. pylori* (p=0.120).

The age of *H. pylori* positive patients was 53.5 $\pm$ 15.8 years, and the age of *H. pylori* negative patients was 53.05 $\pm$ 15.9 years, and these differences were not considered significant (p=0.817). No statistical significance was found for chronic diseases (Table 1).

Table 1. Comparison of age, gender and chronic diseases of patients with <i>H. pylori</i> positive and negative groups			
	<i>H. pylori</i> positive n=110	<i>H. pylori</i> negative n=175	p
Age, year	53.5 $\pm$ 15.8	53.05 $\pm$ 15.9	0.817
Gender n (%)			
Male	33 (30)	37 (21.4)	0.120
Female	77 (70)	138 (78.6)	
Hypertension, n (%)			
Yes	57 (51.8)	81 (46.6)	0.397
No	53 (48.2)	93 (53.4)	
Diabetes mellitus, n (%)			
Yes	56 (50.9)	84 (48.3)	0.715
No	54 (49.1)	90 (51.7)	
Coronary artery disease, n (%)			
Yes	5 (4.5)	10 (5.7)	0.789
No	105 (95.5)	164 (94.3)	
Cerebrovascular accident, n (%)			
Yes	0	2 (1.2)	0.523
No	110 (100)	171 (98.8)	
Heart failure, n (%)			
Yes	3 (2.7)	4 (2.3)	1
No	107 (97.3)	169 (97.7)	

When blood groups were analysed, 37.3% of *H. pylori* positive patients belonged to group O and 38.2% to group A.

There was also no significant difference between negative patients and the opposite groups (p=0.242) (Table 2).

Table 2. Comparison of <i>H. pylori</i> positive and negative groups in terms of blood groups			
	<i>H. pylori</i> positive n=110	<i>H. pylori</i> negative n=175	p
A blood group, n (%)	41 (37.3)	55 (31.4)	0.242
O blood group, n (%)	42 (38.2)	71 (40.6)	
B blood group, n (%)	15 (13.6)	37 (21.1)	
AB blood group, n (%)	12 (10.9)	12 (6.9)	

## DISCUSSION

The findings of our study show that *H. pylori* infection is more common in individuals with A and O blood groups. It was determined that 38.2% of the patients with *H. pylori* infection had blood group A and 37.3% had blood group O. This finding was supported by previous studies showing the distance the link between *H. pylori* and blood classification systems.

Boren et al. reported that Lewis and H blood group antigens have a binding function of transmission of *H. pylori* to human gastric mucosa. In this study, the majority of the people with *H. pylori* receptor were individuals with blood group O. They reported that most of the *H. pylori* positive individuals had O blood group (7). In addition, it has also been suggested that blood group A and B antigens may prevent the binding of *H. pylori* and the economic risk may be lower in these groups (8). Mentis et al. reported in a study that individuals with duodenal ulcer belonged mostly to group O, which may be related with *H. pylori* (9).

Similarly, in another success, it was stated that Lewis B antigen showed weak binding of *H. pylori* to the gastric epithelium with AB blood group records and the risk of disease was lower in individuals with AB blood groups (10). In another development, *H. pylori* positivity was analysed according to blood groups and it was reported that gastric and duodenal ulcers were associated with A blood type (11).

However, Konur and co-workers investigated whether there was a relationship between *H. pylori* and blood groups and found no significant relationship between the blood classification system and *H. pylori* (12). Similarly, Şenkaynağı and other scientists did not find a significant relationship between *H. pylori* infection and blood groups and found that the distribution of infection among blood groups was similar. This suggests that *H. pylori* infection may be related not only with blood group, but also with other symptoms, especially environmental and genetic variables (13).

Nalbant and Aydın examined whether there is a relationship between *H. pylori* infection and vitamin D, blood groups and hemogram parameters and found that the highest rate of blood group A was 49%, but there was no relationship between *H. pylori* positivity and blood groups (14). In another study conducted by Önder et al. no significant difference was found between *H. pylori* positivity, Rh factor and gender and it was concluded that AB blood type may be less common in terms of *H. pylori* (15). In a different study, Sarmış and colleagues analysed whether there is a link between *H. pylori* found positive in gastroduodenal biopsy and ABO Rh blood groups as a result of retrospective examination of 1774 patient data and reported that *H. pylori*, which is common in many countries, was more common in the female sex, although no significant relationship could be found between *H. pylori* and blood and Rh groups (16). In the study conducted by Rizatto et al., although there

are limited number of studies on the relationship between ABO blood groups and precancerous gastric lesions, it was reported that the risk of precancerous gastric lesions was higher in *H. pylori* positive individuals with blood group A compared to those with blood group O. In addition, the risk of gastric cancer development in individuals with blood group A was found to be significantly higher than in individuals with other blood groups (17). However, in a different study conducted by Gisi and İspiroğlu, contrary to the findings of Rizatto et al. the rates of precancerous gastric lesions were found to be higher in individuals with B and AB blood groups, although not statistically significant. This finding may be related with the family tree and geography of the individuals included in the study (18). Tüzün et al. reported that they did not find any significance in the study in which *H. pylori* and blood group antigens were analysed, but they also reported that more comprehensive studies with a larger number of patients are needed (19).

## CONCLUSION

This study shows that *H. pylori* infection may be more common in individuals with A and O blood groups. In particular, *H. pylori* infection was more common in blood group A with 38.2% and in blood group O with 37.3%. This finding supports the hypothesis that the risk of *H. pylori* infection may be related to blood groups. This study highlights the possible impact of blood types on susceptibility to *H. pylori* infection, while additional large-scale research is required. An enhanced comprehension of the influence of blood groups on infection susceptibility may aid in the formulation of novel preventative and therapeutic approaches to address *H. pylori*.

Understanding the interplay between genetic, environmental, and physiological factors will provide deeper insights into the pathogenesis of *H. pylori* and its clinical implications.

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