

IDENTIFICATION OF ASSOCIATION BETWEEN ATHEROSCLEROSIS AND PREVALENCE OF H. PYLORI

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ABSTRACT

Background: Atherosclerosis is the buildup of fats, cholesterol, and other substances in and on the artery walls. Although it is often considered a heart problem, it can affect arteries anywhere in your body, can be treated. Healthy lifestyle habits can help prevent atherosclerosis. **Objective:** To evaluate and identify the association between atherosclerosis and the prevalence of H. pylori. **Method and materials:** We collected 40 volunteers, 20 had atherosclerosis, and 20 were healthy, and we tested them for H. pylori IgG; we calculated the P-value adjusted to age parameter by using logistic regression. **Statistical method:** we do the statistics through the XL Stat program. The numerical data with normal distribution were described as mean \pm standard deviation. Categorical data were described as frequency and percentage. An unpaired t-test analyzed the difference between groups of normally distributed numerical data. The categorical data difference was analyzed using the chi-square test and Fisher's exact test. Finally, the association between the incidence of atherosclerosis and the prevalence of Helicobacter pylori IgG was determined by using logistic regression. The cut-off value for significance was P value = 0.05. **Result and Conclusion:** The results are 0.076 (more than 0.05); this means that H. pylori have no relationship to atherosclerosis with the presence of the age factor.

KEYWORDS: Atherosclerosis, Helicobacter Pylori, and Ischemic heart disease.

INTRODUCTION

Atherosclerosis is a pattern of the disease arteriosclerosis.^[1] in which the wall of the artery develops abnormalities, called lesions. These lesions may lead to narrowing due to the buildup of atheromatous plaque.^[2] Initially, there are generally no symptoms.^[3] When severe, it can result in coronary artery disease, stroke, peripheral artery disease, or kidney problems, depending on which arteries are affected.^[3] Symptoms, if they occur, generally do not begin until middle age.^[4] Most symptoms of atherosclerosis don't show up until a blockage occurs. Common symptoms include chest pain or angina, pain in your leg, arms, and anywhere else with a blocked artery, shortness of breath, fatigue, confusion, which occurs if the blockage affects circulation to your brain, and muscle weakness in your legs from lack of circulation.

It's also important to know the symptoms of heart attack and stroke. Both of these can be caused by

atherosclerosis and require immediate medical attention. Diagnosed by a physical exam if the patient has symptoms of atherosclerosis. Treatment of the established disease may include medications to lower cholesterol such as statins, blood pressure medication, or medications that decrease clotting, such as aspirin.^[5] Several procedures may also be carried out, such as percutaneous coronary intervention, coronary artery bypass graft, or carotid endarterectomy.^[5] Both conditions (H. pylori and atherosclerosis) are more prevalent in the population, increase with age, and are related to socioeconomic status. Numerous studies have shown that CAD patients have a higher prevalence of H. pylori infection.^[6,7] By this mechanism.

Antibodies against H pylori Cag A (cytotoxin associated gene A) antigen can cross-react with B-actin protein on the surface of blood vessels endothelium leading to damage in vessels wall.

Helicobacter pylori is an aerobic Gram-negative bacillus that colonizes the gastric mucosa^[8] and duodenum, causing mucositis, and is associated with peptic ulcers in the stomach and duodenum and stomach cancer. Although more than 80% of people infected with the bacteria have no symptoms, symptoms associated with *H. pylori* can be mild or vary over time. They can be nonspecific or the result of other conditions. Inflammation or damage to the stomach lining may cause moderate or severe stomach reactions, which are burning pain in your stomach, nausea, anorexia, frequent burning, bloating, and unintended weight loss.

The examination is done by detecting antibodies in the blood, antigen in stool, and exhaling, which is known as urea breath test (UBT), where the patient is given a urea drink that contains carbon 14 or 13, and then search for carbon dioxide CO₂, which is collected and calibrated by the method of exhaling urea examination.^[9,10]

The first treatment step is to apply a triple therapy for 10-14 days, consisting of a proton pump inhibitor such as omeprazole clarithromycin and amoxicillin.^[11] It has been found that increasing numbers of infected individuals host antibiotic-resistant bacteria, which leads to failure of the initial treatment. The patient needs to repeat the antibiotic treatment or use another treatment method.

Such as the quadruple treatment that adds bismuth suspension, such as bismuthic salicylate^[12,13] to treat strains of *H. pylori* resistant to clarithromycin. It has been suggested that levofloxacin be used as part of treatment.^[14,15]

Objective: To evaluate and identify the association between atherosclerosis and the prevalence of *H. pylori*.

MATERIAL AND METHODS

We took 40 volunteers from Babel and Karbala province from January to September in 2021, and ethical approval by the Institutional Ethics Committee approved the study.

Twenty(20) of them are patients with atherosclerosis, and 20 are healthily excluded from the people that have taken triple therapy in the past. And we asked them about their age, weight, length, gender, smoker or not, family history, DM, and about others CVD. The test of the presence of the *H pylori* IgG in blood was done using the *H Pylori* antibody rapid test cassette by following steps:

1. Cleaned patients' fingers with an alcohol swab and waited until it was dry and then punctured the fingertip with the lancet and wiped away the first sign of blood.
2. Pick up the blood by the pipette and apply one drop of the blood to the sample well of the device.
3. Allow the specimen to be absorbed for about 30 seconds. If one line appeared on the Rapid test, the

result would be negative for *H. pylori*, or if two lines appeared on the Rapid test, the result would be positive for *H. pylori*.

Statistical method

We do the statistics through the XL Stat program. The numerical data with normal distribution were described as mean \pm standard deviation. On the other hand, categorical data were described as frequency and percentage. An unpaired t-test analyzed the difference between groups of normally distributed numerical data. The categorical data difference was analyzed using the chi-square test and Fisher's exact test. Finally, the association between the incidence of atherosclerosis and the prevalence of *Helicobacter pylori* IgG was determined by using logistic regression. The cut-off value for significance was P value = 0.05.

Ethical approval

The study was conducted by the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients' verbal and analytical approval before taking the sample. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee.

RESULTS AND DISCUSSION

Table 1: The control group's clinical and demographic characteristics (N=20) and atherosclerosis group (N=20).

Characteristic	Control	Atherosclerosis	P-value
Age	50.50 ± 13.25	61.85 ± 14.54	0.014
BMI	28.97 ± 5.157	28.80 ± 4.367	0.909NS
Gender			
• Male	10 (50%)	14 (70%)	0.197
• Female	10 (50%)	6 (30%)	NS
Smoking			
• Yes	7 (35%)	5 (25%)	0.490
• No	13 (65%)	15 (75%)	NS
Concomitant disease (CVD)			
• Yes	8 (40%)	12 (60%)	0.206
• No	12 (60%)	8 (40%)	NS
Concomitant disease (DM)			
• Yes	3 (15%)	7 (35%)	0.273
• No	17 (85%)	13 (65%)	NS
Family history of atherosclerosis			
• Yes	4 (20%)	9 (45%)	0.176
• No	16(80%)	11 (55%)	NS

BMI: body mass index; NS: not significant; CVD: cardiovascular disease; DM: diabetes mellitus.

Table 2: Contingency table for the association between the incidence of Atherosclerosis and *Helicobacter pylori* incidence.

Data analyzed	H. pylori +	H. pylori -	Total	P value*	95% Confidence interval
Control	6 (30%)	14 (70%)	20 (100%)	0.076 NS	-2.703 - 0.133
Atherosclerosis	13 (65%)	7 (35%)	20 (100%)		
Total	19 (47.5%)	21 (52.5%)	40 (100)		

* P-value adjusted to age parameter.

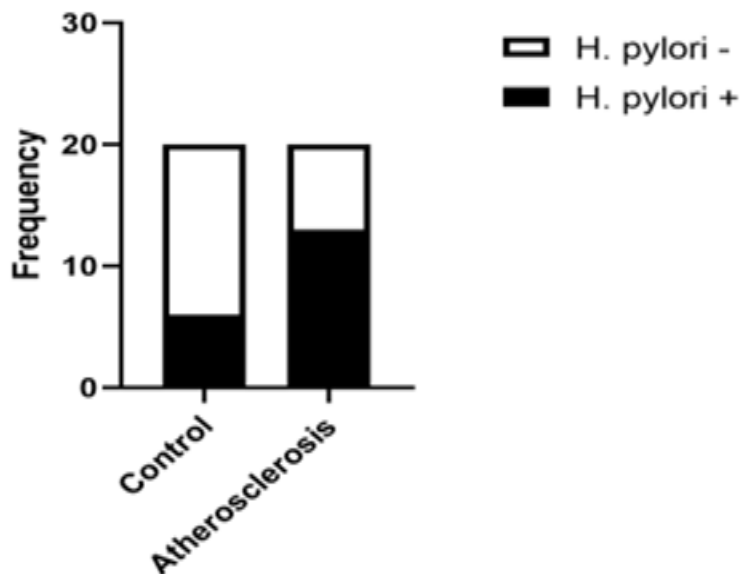


Figure 1: Distribution of *Helicobacter pylori* among individuals in study groups

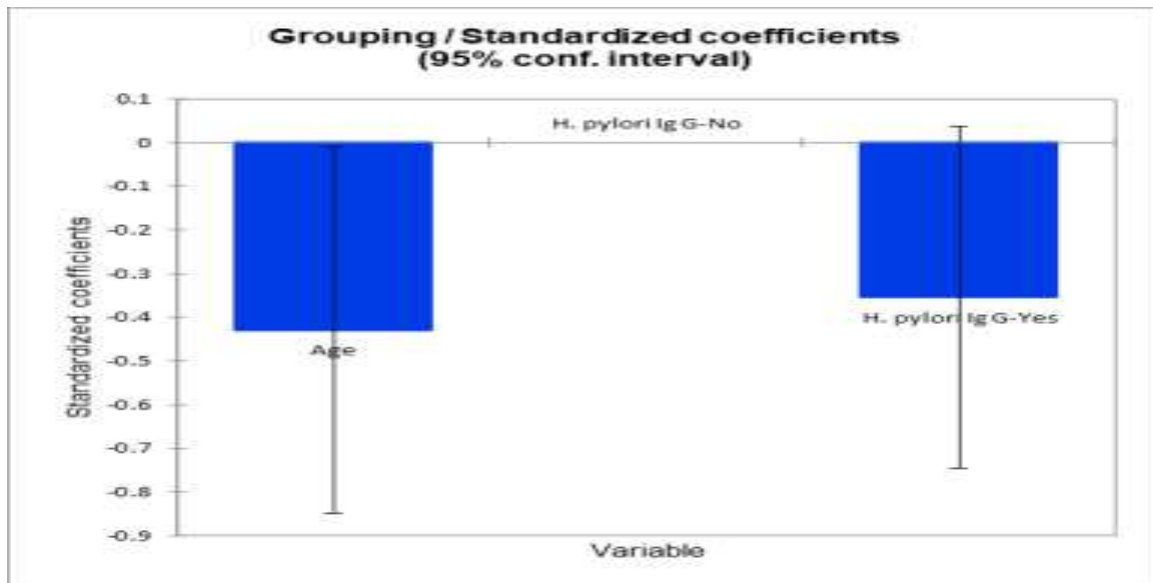


Figure 2: The significance of each variable on a regression model of patients group.

We collected 40 volunteers, 20 who have atherosclerosis, and 20 healthy. We tested them for H. pylori IgG and asked them about age, weight, length, gender, smoker or not, family history, DM, and others CVD and family history of atherosclerosis.

And after analyzing the information statistically, we found that BMI, gender, smoking, diabetes, other CVD, and family history of atherosclerosis are not significantly different between control and case groups because the p-value is more than 0.05 while age was significantly different between control and case groups because the p-value is less than 0.05.

Table (2) calculates the P-value adjusted to the age parameter using logistic regression, and the result is 0.076 (not significant). This means that H. pylori have no relationship to atherosclerosis with the presence of the age factor, and the confidence interval is (-2.703 - 0.133). Since this period passes by zero, this confirms no relationship between H. pylori and atherosclerosis.

In figure (1), the level of H. pylori (+) in patients with atherosclerosis is higher than the healthy ones, but this is not statistically evident that H. pylori are considered a risk factor, especially after taking age into account by using logistic regression.

Figure (2) shows a direct relationship between age and the risk of atherosclerosis.

CONCLUSION

when we searched for other studies on the same topic, we found the Research Ethics Committee approved this study of Mashhad University of Medical Sciences, Iran.

The study results showed no significant relationship between coronary artery atherosclerosis and H. pylori infection using the PCR method and p-value = 0.6.^[16]

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Conflict of interest

None declared.

Ethical approval

The study was conducted by the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients' verbal and analytical approval before taking the sample. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee.

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