Simultaneous Helicobacter Pylori Infection in Gastric Mucosa and Gallbladder Mucosa in Patients with Cholecystitis; Is There Any Relationship?

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Abstract

Background: This study aimed to assess the prevalence of Helicobacter pylori infection in gastric and gallbladder in patients with acute cholecystitis or symptomatic cholelitiasis undergoing cholecystectomy.

Methods: 43 patients with biliary disease (cholecystitis or cholelitiasis) with inclusion criteria were selected in Shahid Modarres Hospital, Tehran, Iran. The data including age, sex, and the presence of Helicobacter pylori in biopsy samples of gallbladder and gastric mucosa for each patient were recorded and analyzed using SPSS software.

Results: The biopsy specimens of gastric and gallbladder mucosa of 43 patients with the mean age of 54.8 ± 9.9 years were studied. 22 (51.2%) patients had acute cholecystitis and 21 (48.8%) had cholelithiasis. Among the gastric samples, 14 patients (32.6%) (9 men and 5 women) and in the gallbladder samples, 19 patients (44.2%) (8 women and 11 men) were positive for Helicobacter pylori. The simultaneous presence of Helicobacter pylori in the gastric and gallbladder mucosa was seen in 6 patients (13.9%). 10 patients (23.2%) were smokers, and 33 (76.7%) were non-smokers.

Conclusions: It can be said that the presence of Helicobacter pylori in gallbladder can play an important role in the creation and spread of the infection. But the simultaneous presence of Helicobacter pylori infection in gastric and gallbladder cannot be a good standard to evaluate the diseases of the bile ducts.

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Introduction

In developing countries, the Helicobacter pylori (H. pylori) infection could be observed in 80% of the adults (1). There are conflicting findings about the simultaneous colonization of H. pylori in gastric mucosa and other gastrointestinal disorders such as infections of the gallbladder, stomach cancer, liver diseases, and intestinal diseases (2-5).

The concurrency of H. pylori infection in the stomach and gallbladder are proposed in recent studies to justify the differences in severity of symptoms and responses to treatment (6,7). According to the conducted studies, this concurrency was reported about less than 10% to 80% in different parts of the world (8). Today, the discussion about the concurrency of H. pylori infection and fatty liver, inflammatory bowel disease, and even heart and lung diseases are proposed (9-12).

Due to the regional differences in H. pylori infection, determination of the concurrency of H. pylori infection in gastric and gallbladder mucosa can result in a multifaceted view in the treatment of patients with gallbladder infections. This study aimed to assess this relationship.

Materials and Methods

In this cross-sectional observational study, 43 patients with acute cholecystitis or symptomatic cholelithiasis who referred to Shahid Modares hospital, Tehran, Iran, and underwent cholecystectomy surgery in 2014 were enrolled. Each participant signed a written informed consent before enrolling in the study and all the patients' information remained confidential.

The inclusion criteria were confirmation of the disease based on the history, clinical examination and

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ultrasound study, being above 40 years of age, having symptoms of dyspepsia. Patients who had undergone emergency surgery and patients with symptomatic cholelithiasis who had been treated for H. pylori infection were excluded from the study.

The patients were referred to the endoscopy ward for biopsy to determine the presence of H. pylori in gastric mucosa; a sample was taken from the antral gastric mucosa. Besides, the sampling from the gallbladder was done during the cholecystectomy surgery. To confirm the presence of H. pylori in the gathered mucosa, Giemsa staining was used.

The obtained data were analyzed with chi-squre test and using indicators such as frequency distribution, frequency percentage, and mean via SPSS software (version 21, SPSS Inc., Chicago, IL). To study the relationship between the gender and the simultaneous presence of bacteria in the gastric mucosa and gallbladder, as well as the relationship between smoking and gender of patients with their pathological status, chi-square test was used.

Results

In this study, the stomach mucosa and gallbladder biopsy samples of 43 patients (20 men and 23 women) with the mean age of 54.8 ± 9.9 years (minimum of 40 and maximum of 80 years; median: 55 years) were studied. Among the subjects, 22 patients (51.2%) had acute cholecystitis and 21 (48.8%) had cholelithiasis.

Using Giemsa staining techniques on biopsy specimens of the patients, H. pylori was positive in gastric mucosa in 14 patients (32.6%) (9 men and 5 women) and negative in 29 patients (67.4%) (11 men and 18 women). In addition, it was positive in the gallbladder in 19 patients (44.2%) (11 men and 8 women) and negative in 24 patients (55.8%) (9 men and 15 women). The simultaneous presence of H. pylori in gastric mucus and gallbladder was seen in 6 patients (13.9%) (4 men and 2 women).

There was no relationship between the presence or absence of H. pylori in gastric mucus or gallbladder, as well as the simultaneous presence of bacteria in the gastric mucus and gallbladder with the pathological conditions (acute cholecystitis and cholelithiasis) ($P = 0.035$).

In this study, 10 patients (23.2%) were smokers and 33 (76.7%) were non-smokers.

In addition, no relationship was found between the gender and the simultaneous presence of bacteria in the gastric mucosa and gallbladder ($P = 0.630$), as well as smoking and gender with the pathological status of the patients (cholecystitis and cholelithiasis) ($P > 0.520$).

Discussion

The aim of this study was to evaluate the concurrent of H. pylori infection in gastric mucosa and gallbladder mucosa of patients with acute cholecystitis and symptomatic cholelithiasis. Comparing the results of the frequency percentage of H. pylori prevalence, the results indicated that the frequency of this bacterium in the patients' biliary mucosa was more than the stomach samples. The results showed that there was no significant relationship between the presence of H. pylori in the gastric mucosa, as well as the simultaneous presence of bacteria in the stomach and gallbladder of patients with biliary disease. These results were similar to the results of Silva et al. (13).

H. pylori plays an important role in the pathogenesis of peptic ulcer disease and a successful treatment of it leads to the treatment of the disease. Although several invasive and non-invasive methods for the accurately diagnosis of H. pylori are shown but the histologic examination of the biopsy has remained as a gold standard for diagnosis.

The role of H. pylori infection in the formation of different types of gallstones is still unclear. In fact, no evidence of a living organism has been observed in the gallbladder and biliary tract tissue and all the recently published studies are based on the techniques for detection of DNA and bacterial antigen. However, positive presence of the DNA and bacterial antigen in the gallbladder had a significant relationship with the presence of inflammation in the gallbladder and cholelithiasis.

Several studies have examined the relationship between the presence of H. pylori in the gallbladder and biliary diseases. Silva et al. showed a significant relationship between the risk of cholelithiasis and being a woman ($P = 0.020$), increasing in age ($P = 0.002$) and the presence of bacterial DNA in biliary sac tissue ($P = 0.002$) and also a significant correlation between the presence of the bacteria in the gallbladder tissue and the cholecystitis in women ($P = 0.009$) (13).

Bulajic et al. aimed to assess the association between H. pylori and biliary tumors and found a significant relationship between the presence of H. pylori in the stomach and gallbladder with age and the clinical diagnosis. Patients with gallstones had a risk of 3.5 times of H. pylori infection in the gallbladder compared to the control group (without stones and carcinoma). The presence of this bacterium was 9.9 times more in patients with biliary carcinoma. This showed a strong association between the presence of H. pylori and biliary carcinoma (14).

The results of this study showed no significant association between smoking and the status of the disease in patients. The simultaneous presence of bacteria in the gastric mucus and the gallbladder of patients showed no differences among the genders and there was no significant relationship observed between the gender and the pathological status of the patient. The obtained results were different from the other studies (13).

According to the results, the presence of H. pylori in gallbladder in patients with biliary disease can have an important role in the development of acute infection. It appeared that H. pylori infection independently caused illness in these two organs but the simultaneous presence of H. pylori infection in the stomach and gallbladder could not be a good marker for the evaluation of biliary disease.

Conflict of Interests

Authors have no conflict of interests.

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