Helicobacter pylori and gastroesophageal reflux disease

A. Garrido Serrano, J. A. Lepe Jiménez, F. J. Guerrero Igea and C. Perianes Hernández

Unit of Digestive Diseases. 1Microbiology Unit. 2Department of Internal Medicine. Hospital Comarcal de Riotinto. Huelva, Spain

ABSTRACT

Objectives: 1. To determine the prevalence of Helicobacter pylori (H. pylori) infection in patients with gastroesophageal reflux disease (GERD), and to compare it with that in a control group. 2. To study the percentage of H. pylori-positive GERD patients according to different grades of esophagitis.

Material and methods: H. pylori prevalence by serological tests was compared among 692 patients with GERD and 200 healthy volunteer controls. Subsequently, the percentage of H. pylori was analyzed in the different grades of esophagitis, according to the Savary-Miller classification.

Results: no differences between the GERD group and control group were detected regarding age (50.5±14.7 vs 50.7±16.4 years, ns) and sex (63 vs 66% of men, ns); on the other hand the prevalence of H. pylori was 40% in the GERD group facing 66% in the control group, p <0.01. There were no differences in H. pylori prevalence according to the different grades of esophagitis, but logistical regression analysis showed that the absence of H. pylori infection was associated with the presence of grade IV esophagitis.

Conclusions: the prevalence of H. pylori infection in GERD patients is lower than that of the general population, and its absence is associated with more severe grades of the disease. These results indicate that H. pylori plays a protective role against GERD.

Key words: Gastroesophageal reflux. Esophagitis. Helicobacter pylori.

INTRODUCTION

H. pylori was first isolated by Warren and Marshall from gastric biopsies of patients with atrophic chronic gastritis and peptic ulcer (1). Since then, it has been recognized as one of the most common infections in humans, which is involved in the pathogenesis of gastritis, gastroduodenal ulcer, gastric adenocarcinoma and B-cell gastric lymphoma (2-4).

At present, the role of this microorganism in GERD is still to be defined; our group found an elevated incidence of reflux in ulcerous patients after H. pylori eradication (5), and other studies suggest that this infection improves the efficacy of antisecretory treatment in healing esophagitis and maintenance of remission (6). Nevertheless, recent studies do not support these results (7,8). Therefore, in this article we study the role played by the H. pylori in GERD.

MATERIAL AND METHODS

We compared the prevalence of H. pylori in a group of 692 patients with GERD with prevalence of this infection in another group of 200 volunteer controls randomly selected from the same geographical area, without evidence of acid-related diseases or upper digestive tract symptoms. Initial endoscopic examination was carried out in all subjects, establishing a diagnosis of GERD: a) in the presence of endoscopic esophagitis, according to the Savary-Miller classification; and b) in patients without evidence of endoscopic esophagitis (grade 0) when referring at least two of the following symptoms: heartburn, acid regurgitation or pain by swallowing at least three days a week in the last two months, constituting the main reason for consultation.

Determination of H. pylori was carried out by serological tests using the immunochromatographic commer-
tional method, dBest H. pylori test (Ameritek, USA), that allows a qualitative detection of IgG, IgM and IgA antibodies against H. pylori. The test had a sensitivity of 93% and a specificity of 100% (data provided by the manufacturer and locally validated).

The statistical study was made using a R-SIGMA program. Results of the sample were expressed as mean ± standard deviation or as percentages. The Chi-square or exact Fisher’s test were used for the analysis of qualitative variables. A logistic regression analysis was performed including quantitative and qualitative variables of clinical interest associated with grade IV esophagitis. Cigarette consumption was expressed as ordinal qualitative variable for logistical analysis purposes. All values of p <0.05 were considered statistically significant.

RESULTS

No differences were found between GERD and control groups regarding age and sex. On the other hand, serum prevalence of H. pylori was significantly higher in the control group (66 vs 40%, p <0.01) as shown in table I.

Table I. Prevalence of Helicobacter pylori in controls and patients with gastroesophageal reflux disease (GERD)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Controls n=200</th>
<th>GERD n=692</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>50.5 ±14.7</td>
<td>50.7 ± 16.4</td>
<td>NS</td>
</tr>
<tr>
<td>Men (%)</td>
<td>63%</td>
<td>66%</td>
<td>NS</td>
</tr>
<tr>
<td>Women (%)</td>
<td>37%</td>
<td>34%</td>
<td>NS</td>
</tr>
<tr>
<td>Helicobacter pylori (%)</td>
<td>66%</td>
<td>40%</td>
<td>&lt;0.01*</td>
</tr>
</tbody>
</table>

GERD: gastroesophageal reflux disease. Results reported as mean ± SD or percentage. *: Chi-square test.

Table II shows that no significant differences in the prevalence of H. pylori exist among the different grades of esophagitis. However, a gradual decrease is observed as the grade of esophagitis increases, fluctuating the prevalence from 45% in patients with grade 0 to 31% in those with grade IV.

In fact, logistic regression analysis shows that the absence of H. pylori as well as advanced age, male sex and smoking habit, were risk factors associated with grade IV esophagitis at initial endoscopy (Table III).

Table II. Prevalence of Helicobacter pylori according to the different grades of esophagitis (n=692)

<table>
<thead>
<tr>
<th>Grades</th>
<th>n</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>152/339</td>
<td>45</td>
<td>NS</td>
</tr>
<tr>
<td>I</td>
<td>34/83</td>
<td>41</td>
<td>NS</td>
</tr>
<tr>
<td>II</td>
<td>51/153</td>
<td>33</td>
<td>NS</td>
</tr>
<tr>
<td>III</td>
<td>18/57</td>
<td>32</td>
<td>NS</td>
</tr>
<tr>
<td>IV</td>
<td>21/60</td>
<td>31</td>
<td>NS</td>
</tr>
</tbody>
</table>

DISCUSSION

The relationship between H. pylori and GERD is not well established, and in the medical literature is possible to find a variety of reports. While some authors find a close relationship between both conditions, others do not report any relationship between them and finally others groups of authors maintain that this microorganism has even a protective effect of against GERD (9).

Different studies have evaluated the prevalence of the infection in patients with GERD; some of them did not include a control group without GERD, and therefore they are not valid. However, a recent meta-analysis (1) has systematically reviewed 27 studies that included control groups. This analysis showed that mean prevalence of H. pylori infection was 37% in patients with GERD, a significant lower frequency of infection than in control group (48%). These results are similar to those obtained in our study. Therefore, the Odds ratio for the association of H. pylori infection and GERD was 0.60 (IF 95%, 0.48-0.70), indicating that this infection has a protective effect on the disease.

As reported in our series, some authors have also demonstrated that GERD patients with H. pylori infection have a lower intensity of reflux or a less severe grade of esophagitis (11,12), although again there is no consensus on this point (13); likewise, the appearance of GERD has been described after eradication of H. pylori in ulcerous patients (5).

Several potential mechanisms have been postulated to explain the protective effect of H. pylori against GERD: ammonia produced by the bacteria could neutralize gastric acidity (14), decreased gastric acid secretion as a result of chronic atrophic gastritis produced by H. pylori at the fundic mucosa (15), or hypergastrinemia induced by the infection that would increase the tone of the lower esophageal sphincter, reducing the probability of reflux episodes (16).

At epidemiological level, a decrease in the incidence of gastroduodenal ulcerous diseases in western countries has been observed in the last few decades, probably due to a reduction in H. pylori infection, the main etiological agent of this disease. On the other hand, incidence and prevalence of GERD, Barrett’s esophagus and adenocarcinoma of the esophagus have notably increased throughout the same
period (15,17). This opposite epidemic tendency in countries where the prevalence of H. pylori infection is descending, suggests that it may act as an etiological factor of peptic ulcer disease and, at the same time, as a protective agent against GERD and its complications.

It has also been postulated that not only the presence of H. pylori but also the virulence of each genotype would be important in the protection from GERD and its complications. Thus, it has been demonstrated that patients infected by cagA positive genotypes, which are more virulent, have a less probability of suffering GERD and its complications (18,19), probably by inducing a greater degree of atrophic gastritis and hypochlorhydria (20), although again other authors have not confirmed these results (21). Therefore, as mentioned above, the relationship between H. pylori and GERD remains to be clarify, since there are many studies with similar aims and methodology, but with totally different results (21).

According with our results, we logically do not recommend to investigate nor to eradicate H. pylori in patients with GERD, and this is exactly what we carry out in our daily practice, since we have found that H. pylori has a protective effect against this disease.

REFERENCES