Helicobacter pylori infection has no impact on manometric and pH-metric findings in adolescents and young adults with gastroesophageal reflux and antral gastritis: eradication results to no significant clinical improvement

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Abstract

The relationship between *Helicobacter pylori* (Hp) gastritis and gastroesophageal reflux disease (GERD) remains controversial. The aim was to investigate the association between Hp infection and gastroesophageal reflux (GER) and the impact of Hp eradication on esophageal acid exposure and motility in adolescents and young adults with Hp gastritis and GERD. Sixty-four patients with symptoms suggestive for GERD, of which 40 Hp-positive (group A) and 24 Hp-negative (group B), underwent endoscopy-biopsy, esophageal manometry and 24-hour pH-metry. All group A patients received eradication treatment and were re-evaluated six months later again with 24-hour pH-metry, esophageal manometry, endoscopy-biopsy and clinical assessment.

At inclusion, there were no significant differences between the two groups regarding sex, age, grade of endoscopic esophagitis, manometric and pH-metry findings. All Hp-positive patients had an antral predominant gastritis. Eradication of Hp was successful in all patients, and gastritis and esophagitis were healed in all patients. The mean lower esophageal sphincter pressure (LESP) increased significantly from 11.25 mmHg before to 11.71 mmHg after eradication ($P<0.05$). A significant decrease in reflux index was observed (mean RI 6.02% before versus 4.96% after eradication ($P<0.05$). However clinical symptoms of GER improved not significantly after 6 months follow up. Conclusively, in children and young adults with GER symptoms and GERD, the presence or absence of Hp has no impact on manometric and pH-metric findings. Eradication of Hp infection results in increase in LESP with a consequent decrease in esophageal acid exposure but not significant clinical improvement.

Introduction

The relationship between Helicobacter pylori (Hp) infection and gastroesophageal reflux disease (GERD) has been debated for many years and is still unclear.[1,2] Both a protective and an aggressive role for Hp on GER-incidence and severity have been suggested, while other authors proposed an independent coincidence of the two conditions.[1-3] The impact of Hp eradication in patients with GERD is an even more complex debate.[4-7]

The aim of this study was to investigate the association between Hp infection and GERD in a population of Greek adolescents and young adults. The second goal was to evaluate the impact of Hp eradication on esophageal motility, esophageal acid exposure and clinical improvement in patients with GERD.

Materials and Methods

Patients

For a period of 8 years, 64 Greek adolescents and young adults presenting with GERD symptoms during at least six months and an abnormal pH-metry [reflux index (RI) >5%] were enrolled in the study (Table 1). Exclusion criteria were known past history of peptic ulcer disease, esophageal stricture, Barrett's esophagus and motility disorders of the esophagus.

Methods

Sixty-four patients with symptoms suggestive for GERD and an abnormal 24-hour pH-metry were included in this study. The pH-metry was performed with a single antimony electrode (Synectics Medical) and computer analysis software programme. The results are displayed as reflux index (RI). All underwent an upper gastro-intestinal tract endoscopy with gastric biopsies and an esophageal manometry. For sedation intravenous midazolame (Dormicum) 2-5 mg was used.

The endoscopic esophagitis was scored using the modified Savary-Miller classification (Table 2).[8,9] Two biopsy specimens were obtained from the antrum and two from the corpus for histological assessment. Giemsa histology performed in 45 patients and CLO in 19 cases.

A patient was considered Hp-positive (Group A) if CLO test of the biopsy specimen was positive or if *H Pylori* organisms were found at the histological examination Esophageal manometry was performed using an 8 channel perfusion catheter (Synectics Medical).

All group A patients received eradication treatment with rabeprazole (Pariet®) 20 mg, amoxicillin 1 gr and clarithomycin 500 mg, all b.i.d for 7 days and were re-evaluated 6 months later, with pH-metry, manometry and endoscopy-biopsy and clinical assessment. Comparisons were made between Hp status groups (A and B) before eradication and also in group A patients before and after eradication of Hp.

Statistical analysis was made with the statistical program GraphPad Instat, Chicago USA. Data are presented using descriptive statistics. For comparing arithmetical continuous variables the non-parametrical test Mann-Whitney U was used. Statistical significance was accepted for a P value of <0.05.

Results

The endoscopy-biopsy and CLO test resulted in 40 Hp-positive (group A) and 24 Hp negative (group B) patients (Table 3). No significant differences were found between the two groups regarding sex, age, grade of esophagitis, manometric and pHmetry findings. In patients with GERD-symptoms and an abnormal pH-metry, Hp status had no impact on pHmetric and endoscopic findings (Table 4). All Hp-positive patients had antral predominant gastritis.

Eradication of Hp resulted in an increase of

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the mean lower esophageal sphincter pressure (LESP) and a significant decrease of the RI. Particularly mean of lower esophageal sphincter pressure increased from 11.25 mmHg to 11.71 mmHg (P<0.05) and mean reflux index decreased from 6.02 % to 4.96% (P<0.05) after *H. Pylori* eradication.

On the other hand clinical symptoms of GER improved not significantly after 6 months follow up (Table 5).

Discussion

The relationship between *Hp* infection and GER(D) remains a matter of controversy. There are data suggesting a protective role of Hp infection in GERD, related to the hypochlorhydria and atrophic gastritis caused by the *H. p*ylori.[7,10-13] Other data suggest an aggravating role, while many studies support a mere co-existance of the two conditions.[3,14] Awad *et al*.[15] studied 37 adult patients with GERD, of whom 75.6% were Hp-positive, using endoscopy, ambulatory 24-hour esophageal pH-metry and manometry: there was no difference in the severity of esophagitis, and acid exposure as well as manometric findings between Hp-positive and Hp-negative groups. We reported similar results in our study.

Manes *et al*.[16] came to the same conclusions by studying 50 adults with GERD, of whom 24 Hp-positive and 26 Hp-negative. The authors concluded that the presence of Hp has no impact on esophageal motility, LESP, or GER.

There are many studies in adults about the impact of Hp eradication on GERD. Most of them include patients with dyspepsia, peptic ulcer and asymptomatic Hp-positive patients. Labenz *et al*.[17] found an exacerbation of GER after eradication of Hp in patients with peptic ulcer disease. More recent studies came to the same conclusion.[18-20] On the other hand, many adult studies support that Hp eradication results in a decreased GER symptomatology. Loren and Sugg included 8 prospective trials in a meta- analysis and showed that Hp eradication improved GER symptoms.[21] Others report that Hp eradication has no impact on GER symptoms, suggesting a co-existance of the two conditions.[22,23] We eradicated *H. Pylori* in 40 patients with GERD symptoms and re-evaluated them in 6 months. We found just a slight improvement of clinical symptomatology that was not statistically significant (Table 5).

There are only very few published studies on the relationship between Hp status, esophageal motility and acid exposure in patients with GERD. Verma *et al.* [24] found no significant correlation between the motility indexes and esophageal acid exposure in patients with GERD after eradication. Guliter and Kandilci studied 18 adult patients with GERD and Hp-gastritis using 24-hour pH-metry and static esophageal manometry.[25] After successful eradication of Hp, no difference was found in the pH and manometric findings and only a slight improvement of clinical symptomatology.

In East-Asian patients, where Hp-gastritis is primarily located in the corpus, the eradication of Hp leads sometimes to an increase in esophageal acid exposure and a worsening of the symptoms. Wu *et al.* [26] studied esophageal acid exposure in 14 adult patients with GERD and Hp-gastritis. Twenty-six weeks after eradication of Hp, three of patients presented with worsening of the heartburn.

Levine *et al*.[27] evaluated the effect of eradication of Hp on GER symptoms in a pediatric cohort of 95 children and adolescent with GER symptoms. They concluded that eradication of Hp did not increased symptoms of GER.

The relation between Hp infection and GERD was studied in 43 neurologically impaired pediatric patients, showing esophagitis in 14/43 patients.[28] Four to 6 weeks after Hp eradication, a second endoscopy was performed: Hp infection was eradicated in all 14 patients with esophagitis but in only 19 of 29 (66%) of those without (P=0.01). In 29 patients with a normal esophagus at the first endoscopy, only one case of esophagitis was observed after *H. pylori* eradication. In our study, in patients with Hp and GERD, a significant increase of the LESP and a decrease of the RI were found after Hp eradication. Normalization of hypergastrinemia after eradication of Hp (not measured in our study) could explain the findings, given that gastrin decreases LESP.[29,30] The increase of LESP, in combination with the decrease of acid volume due to the healing of gastritis may lead to the decrease of esophageal acid exposure. The beneficial results of Hp eradication in this study are most likely due to the type of gastritis of our patients (antral predominant active),

Table 1. Age of patients, reflux index and symptoms at inclusion.

	Mean age in years (min-max)	Reflux index mean % (min-max)	Symptoms %
Total (n=64)	16.37 (14-24)	6.09 (5.0-9.0)	Epigastric pain 28 (43.7)
Boys (n=34)	16.29 (14-24)	6.16 (5.2-8.0)	Nausea or vomiting 22 (34.3)
Girls (n=30)	16.46 (14-24)	6.02 (5.2-8.0)	Gastric contents in the mouth 31 (48.4)
			Heartburn 10 (15.6)
			Belching 15 (23.4)
			Difficulty swallowing 8 (12.5)
			Nocturnal awakens 6 (9.3)

Table 2. Savary Miller classification.

	Grade lesion
I	Single or isolated erosive lesion, oval or linear, but affecting only 1 longitudinal fold.
II	Multiple erosive lesions, non-circumferential, affecting more than 1 longitudinal fold, with or without confluence.
III	Circumferential erosive lesions.
IV	Chronic lesions including ulcer(s), stricture(s), and/or short esophagus, alone or associated with lesions of grades I to III.
V	Columnar epithelium in continuity with the Z line, noncircular, star-shaped, or ci cumferential, alone or associated with lesions grades I to I.

Table 3. *Helicobacter pylori* positive/negative (n=64).

	Positive	Negative
Antral biopsies		
Giemsa	20	10
CLO	08	06
Corpus biopsies		
Giemsa	10	05
CLO	02	03
10Hp status	40	24

Table 4. Endoscopic esophagitis and reflux index according to *Helicobacter pylori* status at inclusion.

	Positive (n=40)	Negative (n=24)
Mean reflux index	6.02%	5.98%
Savary Miller		
Grade 0	22	14
Grade 1	12	6
Grade 2	6	4

Table 5. Clinical symptoms before and 6 months after *Helicobacter Pylori eradication* (n=40).

Symptoms	Before HP eradication (%)	After HP eradication (%)	P
Gastric contents in the mouth	18 (45.0)	12 (30.0)	0.24
Epigastric pain	16 (40.0)	12 (30.0)	0.48
Nausea or vomiting	14 (35.0)	13 (32.5)	1.00
Belching	10 (25.0)	10 (25.0)	1.20
Heartburn	7 (17.5)	2 (5.0)	0.15
Difficulty swallowing	6 (15.0)	2 (5.0)	0.26
Nocturnal awakens	5 (12.5)	5 (12.5)	1.26

the most common type in children and young adults.[31] In case of atrophic corpus gastritis which is associated with decreased gastric acid production the results may be different.[32] The type and the localization of the gastritis may have great importance and may be the result of the age of contamination with the Hp If Hp-infection occurs in teenagers and young adults, the gastritis is limited to the antrum, and antral gastritis is associated with an increase in gastric acid production. The severity of GERD is related to the esophageal acid load, which in turn is affected by acid production in the stomach. Thus, patients with antral gastritis have an increased risk, not only of peptic ulceration, but also of GERD. Eradication of Hp in this population reduces acid production and may improve reflux and ulcer-related symptoms.[32]

Conclusions

In summary, our data suggest that the presence of Hp has no impact on the pH-metric and manometric findings in patients with GERD. In case of Hp infection, the bacterium should be eradicated not only to prevent peptic ulcer and gastric cancer but also because it may have a beneficial effect on esophageal function. However clinical improvement of GERD seems to be not significant after Hp eradication in such patients.

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