

# Knowledge and Practice of General Practitioners and Internists about *Helicobacter pylori* infection in Guilan, Iran

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## ABSTRACT

### BACKGROUND

This study aims to elucidate the knowledge and practice of general practitioners (GP) and internists regarding diagnosis and treatment of *Helicobacter pylori* (*H. pylori*) infection in a high prevalent area, with the intent to assist with future educational strategies for *H. pylori* infection.

### METHODS

In this cross-sectional study in Guilan, a Northern Province of Iran, all GPs and internists in the city of Rasht were included. Questionnaires consisted of questions on demographic characteristics in addition to physicians' knowledge and practice regarding *H. pylori* infection. The questionnaire was verified by a panel of experts, validated by the test-retest method, and distributed among participants. Scores higher than the mean score indicated good knowledge or attitude. Those lower than the mean score indicated poor knowledge and attitude. Data were collected and analyzed by SPSS version 14 software.

### RESULTS

The mean (SD) knowledge and practice score of physicians was  $12.1 \pm 3.13$  and  $2.37 \pm 1.54$ , respectively. Overall, 67.9% of GPs and 91.7% of internists exhibited good knowledge scores, while 72.4% of GPs and 95.8% of internists showed good practice. Physicians who used books or educational programs and had working histories of less than 10 years scored significantly higher in terms of mean knowledge. The mean practice score of physicians who worked in public units and had working histories of more than 5 years and those who had used books or educational programs was significantly higher.

### CONCLUSION

Since *H. pylori* infection is prevalent in Iran and GPs' practices are directly under the influence of knowledge, it is necessary to attempt to increase the level and quality of information among GPs by educational and Continuing Medical Education programs and seminars.

### KEYWORDS

Knowledge; Practice; *Helicobacter pylori*; General practitioners; Internists

## INTRODUCTION

The successful isolation of *Helicobacter pylori* (*H. pylori*) infection from the stomachs of patients with chronic gastritis and peptic ulcer disease in 1983 has fundamentally changed our concept of the etiology, pathogenesis and management of upper gastrointestinal (GI) diseases.<sup>1, 2</sup> Nowadays *H. pylori* is

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thought to be one of the most important factors in the pathogenesis of upper gastroduodenal diseases, particularly in developing countries.<sup>3</sup>

*H. pylori* is a common bacterium that infects about half of the world's population. Prevalence rates are generally much higher in developing countries compared to developed countries. The prevalence of *H. pylori* varies by geographical location, ethnic background, socioeconomic conditions and age.<sup>4</sup>

*H. pylori* is the etiology of peptic ulcer disease, gastritis, gastric mucosa-associated lymphoid tissue lymphoma and gastric adenocarcinoma<sup>5</sup> and is present in 95-99% of duodenal ulcers and most gastric ulcers.<sup>6-8</sup>

Studies from both the northern and southern regions of Iran have demonstrated a high rate of *H. pylori* infection with the frequent rate of development of duodenal ulcer and gastric cancer.<sup>9, 10</sup> Ghanaei and colleagues found a 40% prevalence of *H. pylori* among children in northern Iran.<sup>11</sup>

The majority of patients infected with *H. pylori* initially present with dyspeptic symptoms, with or without alarming signs. In this case, many can and should be treated for *H. pylori* infection even though, in the absence of endoscopy, the primary care physician (PCP) may not have an accurate diagnosis of the underlying disease pathology.<sup>12, 13</sup>

Numerous initiatives have been undertaken to educate health care professionals regarding the appropriate diagnosis and management of this infection. However, results from several recent surveys have suggested that significant confusion and discrepancies are present in the thinking concepts of specialists and GPs with respect to the understanding of the pathogenesis, diagnosis and treatment of *H. pylori* infection. The major uncertainties surround the management of patients with dyspepsia when the PCP needs to make a decision between testing for *H. pylori* infection and treating if positive, or the referral of patients to specialists.<sup>14-18</sup>

Because general practitioners (GPs) are more available than internists to most patients, the present study elucidates the knowledge and practice of GPs and internists about diagnosis and treatment of *H. pylori* infection in order to help future educational strategies about this infection.

## MATERIALS AND METHODS

This cross-sectional study was performed over an 8 month period from April 2009 until December 2009 in Rasht, Guilan, a northern Iranian province. The study population consisted of all GPs and internists of the city. A total of 421 GPs and 48 internists were included. The questionnaire was derived by searching textbooks and different articles, and was created and validated by a panel of experts of Guilan and Tehran Universities of Medical Sciences. Its reliability was documented by a test-retest study, and the validity and reliability was confirmed by Cronbach's alpha (alpha = 0.7).

The questionnaire consisted of three parts, with a total of 26 questions. The demographic part consisted of questions on sex, specialty (GP or Internist), work place (public or private), work history, source of information and participation in continuing medical education programs. The knowledge part consisted of 14 questions about the prevalence of *H. pylori* infection in the population, its role in peptic ulcer disease, dyspepsia and gastric cancer. Finally, in the practice part, six questions were asked in an interview format. If the physicians answered yes to the first question they were requested to answer the remainder of the questions about its diagnosis and treatment methods. Scores higher than the mean score indicated good knowledge or attitude and lower than the mean score indicated poor knowledge and attitude. The questionnaire is outlined in Table 1.

Knowledge questions were completed by physicians, themselves, whereas the practice questions were asked by two researchers in interviews.

**Table 1: Helicobacter pylori knowledge and practice questions.****Helicobacter pylori knowledge questions:**

1. In your idea how many people in Iran are infected with *H. pylori*?
2. *H. pylori* plays a significant role in which of the following diseases:  
A-Duodenal ulcer, B-Gastric ulcer, C-gastric cancer, D- dyspepsia, E-IBS
3. Are low socioeconomic condition, crowd and low hygiene important risk factors of *H. pylori* infection?
4. Is *H. pylori* infection hereditary?
5. Is *H. pylori* infection acquired in childhood?
6. Is oral-oral route a way of *H. pylori* transmission?
7. Does *H. pylori* transmit from mother to child?
8. Is oral-fecal route a way of *H. pylori* transmission?
9. Is serologic test effective in proving *H. pylori* infection?
10. Is stool Ag test effective in proving *H. pylori* infection?
11. Is UBT test effective in proving *H. pylori* infection?
12. Is endoscopy effective in proving *H. pylori* infection?
13. Is there bacterial resistance toward antibiotic therapy?
14. Do the patients need for follow up after therapy?

**Helicobacter pylori practice questions:**

1. Have you ever treated *H. pylori* infection?
2. What have you done to diagnose it?
3. Which treatment choice have you used?
4. What do you do to be sure of its eradication?
5. How long have the treatment period lasted?
6. How long have the eradication lasted?

Physicians who were not interested in participating in the study were excluded, and the identity of all participants remained secret.

Data were collected and analyzed by SPSS version 14 by descriptive statistics and compared means. *P*-Values less than 0.05 were statistically significant.

## RESULTS

Overall, 421 GPs and 48 internists participated in the study. The mean (SD) knowledge and practice scores of participants were  $12.1 \pm 3.13$  and  $2.37 \pm 1.54$ , respectively. Two hundred eighty six (67.1%) GPs and 44 (91.7%) internists scored above the mean value for knowledge ( $p = 0.001$ ). The number of GPs and internists who achieved above the mean value for practice was 305 (72.4%) and 46 (95.8%),

respectively ( $p < 0.001$ ).

The best knowledge scores were achieved for the question about the relationship of *H. pylori* infection and peptic ulcer disease, both among GPs (90.7%) and internists (90.9%). In practice questions, 67.7% of GPs and 60.4% of internists correctly answered the diagnosis-related question and 67.9% of GPs and 70.8% of internists correctly answered the question regarding type of medical treatment. The most common suggested diagnostic test ordered was serologic exam by GPs (66.5%) and endoscopy by internists (91.7%).

Both GPs (71.6%) and internists (60%) generally preferred to use quadruple therapy for treatment of *H. pylori* infection. GPs mostly preferred (60%) a combination of amoxicillin, omeprazol, metronidazol and bismuth. Internists, however, ordered a combination of triple or quadruple therapies that consisted of amoxicillin, metronidazole, omeprazole and bismuth (20%); amoxicillin, tetracycline, metronidazole and bismuth (2.2%); amoxicillin, omeprazole and clarithromycin (6.8%); amoxicillin, furazolidone, omeprazole and bismuth (8.8%); or omeprazole, amoxicillin, clarithromycin and bismuth (2.2%). Among both GPs and specialists, the most prevalent source of information was a combination of media (61%) and continuing medical education programs (54%).

Mean results for knowledge and practice scores according to sex, specialty, workplace, working history, source of information and participation in continuing medical education programs are reported below.

Internists scored significantly higher on knowledge rates than GPs. After statistical analysis and based on LSD post hoc, physicians who used books or educational programs achieved a significantly higher mean knowledge score compared to others. Those physicians with a working history of more than 10 years had a lower knowledge score than those with less working history (Table 2).

**Table 2:** Mean *H. pylori* knowledge scores according to different demographic variables (N= 469).

| Variables                                      |                      | N   | Mean knowledge score (SD) | P     |
|--|----------------------|-----|---------------------------|-------|
| Sex  | Male                 | 252 | 12.05 (3.19)              | NS    |
|  | Female               | 271 | 12.17 (3.06)              |       |
| Specialty                                      | Generalist           | 422 | 11.93 (3.12)              | 0.001 |
|  | Internist            | 48  | 13.64 (2.78)              |       |
| Working history (years)                        | ≤5                   | 142 | 12.9 (3.02)               | 0.001 |
|  | 6-10                 | 113 | 12.02 (3.12)              |       |
|  | ≥11                  | 214 | 11.62 (3.11)              |       |
| Place of employment                            | Private              | 154 | 12.13 (3.10)              | NS    |
|  | Public               | 250 | 12.20 (3.05)              |       |
|  | Both                 | 65  | 11.66 (3.47)              |       |
| Source of knowledge                            | Books                | 82  | 12.74 (3.04)              | 0.04  |
|  | Educational programs | 128 | 11.66 (2.83)              |       |
|  | Media                | 259 | 12.12 (3.27)              |       |
| Participating in continuing education programs | Yes                  | 392 | 12.01 (3.16)              | NS    |
|  | No                   | 74  | 12.13 (3.01)              |       |

NS: Not significant

In this study, the mean practice score for internists was significantly higher than GPs. The mean practice score of physicians who worked in public units was higher than those who worked in private units. Those physicians who had a working history of less than 5 years had a lower practice score than physicians who had more working history (Table 3). Those physicians who used books or attended educational programs had a significantly higher mean practice score than those who used media for education (Table 3).

Overall, there was significant correlation between physicians' mean knowledge and practice scores ( $r = 0.2$ ).

## DISCUSSION

Over the past 17 years, the status of *H. pylori* infection and its relation to upper GI diseases has evolved from a medical curiosity to a well-recognized and extensively investigated pathogen of considerable clinical significance. Because of the extremely high prevalence of *H. pylori* infection in the general population in many countries and the existence of several controversies, a proper and efficient approach to the management of *H. pylori* infection is crucial.<sup>19</sup>

There are several surveys which have suggested that significant confusion and discrepancies are present in the concepts of specialists

**Table 3:** Mean *H. pylori* practice scores according to demographic variables (N= 469).

| Variables                                      |                      | N   | Mean knowledge score (SD) | P     |
|--|----------------------|-----|---------------------------|-------|
| Sex  | Male                 | 252 | 2.56 (1.45)               | 0.003 |
|  | Female               | 217 | 2.14 (1.61)               |       |
| Specialty                                      | Generalist           | 421 | 2.27 (1.55)               | 0.001 |
|  | Internist            | 48  | 3.19 (1.14)               |       |
| Working history (years)                        | ≤5                   | 142 | 1.84 (1.64)               | 0.001 |
|  | 6-10                 | 113 | 2.52 (1.45)               |       |
|  | ≥11                  | 214 | 2.63 (1.44)               |       |
| Place of employment                            | Private              | 154 | 2.8 (1.31)                | 0.001 |
|  | Public               | 250 | 1.98 (1.6)                |       |
|  | Both                 | 65  | 2.84 (1.42)               |       |
| Source of knowledge                            | Books                | 82  | 2.69 (1.56)               | 0.048 |
|  | Educational programs | 128 | 2.13 (2.53)               |       |
|  | Media                | 259 | 2.38 (1.52)               |       |
| Participating in continuing education programs | Yes                  | 392 | 2.4 (1.52)                | NS    |
|  | No                   | 74  | 2.19 (1.66)               |       |

NS: Not significant

and GPs regarding their understanding of *H. pylori* infection and its pathogenesis, diagnosis, and treatment.<sup>2, 16, 17, 20, 21</sup> This study aimed to gauge the current practices, understanding and approaches of GPs and internists regarding the diagnosis and management of *H. pylori* infection in a city in northern Iran that has a high prevalence of *H. pylori* infection.

In the present study, the main source of information was a combination of media and continuing medical education programs. In Ahmed's study, medical journals were the source of information for 32% of GPs,<sup>3</sup> while in Canbaz's study in Turkey the main source of information to GPs were pharmaceutical company sponsored symposia.<sup>20</sup>

In the study by Behnoud and colleagues, 26.7% of GPs and 25.9% of the internists knew about the role *H. pylori* in peptic ulcers<sup>22</sup> and in a study by Darvish-Moghaddam, 41.5% of the GPs and 9.4% of internists were knowledgeable about *H. pylori*.<sup>23</sup> The knowledge level in the present study was much higher than similar surveys. However, the present data suggested a degree of confusion among physicians about the pathological role of *H. pylori* infection. In a study by Huang, 61% of respondents recognized *H. pylori* infection as a gastric carcinogen and over 80% believed that both duodenal ulcer and gastric ulcer were related to the infection, while 63% of physicians knew of the relationship between *H. pylori* eradication and the treatment for dyspepsia.<sup>2</sup> The comparatively low proportion of GPs who recognize *H. pylori* as a gastric carcinogen may be associated with the fact that gastric carcinogenesis is a multistep and multifactorial process, and the relative risk of gastric cancer associated with *H. pylori* infection is only modestly increased.<sup>2</sup> Nevertheless, the results suggest an increase in the awareness of the pathological role of *H. pylori* infection in upper GI diseases when compared to previous surveys.

There are different diagnostic methods for

*H. pylori* infection, of which the gold standard method is endoscopic exam. In Ahmed's study, physicians preferred serological based testing of *H. pylori* in 43%<sup>3</sup> and only 22% of Korean GPs in Kim's study opted for serology as a first test for the detection of *H. pylori*, whereas 55% of Italian physicians in Maconi's study preferred gastroscopy with biopsies for initial diagnostic testing.<sup>21, 24</sup> In a study by Canbaz, 92 (84.4%) of the GPs reported having used one or more tests and 17 (15.6%) never used any test for the diagnosis of *H. pylori* infection. Only 9.8% had used the stool antigen test for diagnosis and GPs reported that they would prescribe symptomatic treatment without ordering diagnostic tests for 29 (26.6%).<sup>20</sup> In an Israeli study by Shirin in 2004, 94.1% of gastroenterologists and 88.9% of internists chose the UBT (urea breath test) for detecting *H. pylori*.<sup>25</sup> In Huang's study in 2003, 62% of participants considered endoscopy as the correct diagnostic method.<sup>2</sup> The results of the present study and similar surveys have shown incomplete knowledge of GPs in comparison with internists about the correct diagnostic methods for *H. pylori* infection which may be due to lessened availability of endoscopy among GPs for the detection of *H. pylori* in symptomatic patients, with more referrals of symptomatic patients to internists.

Peptic ulcers due to *H. pylori* are treated with drugs that eradicate bacteria

(antibiotics), lower peptic acid (PPIs and H<sub>2</sub> blockers) and protect peptic epithelium (bismuth). None of these drugs is effective if prescribed alone. There has been a dramatic evolution in the history of *H. pylori* treatment, starting from a relatively single ineffective agent 16 years ago to the current most commonly used triple therapies. In Huang's study, 89% of respondents use triple therapies and only 10% treated patients with dual combinations. Among all triple therapies, PPI combined with clarithromycin and amoxicillin is the

most commonly used treatment regimen, followed by PPI administered with metronidazole and clarithromycin, or with amoxicillin and metronidazole.<sup>2</sup> In Ahmed's study, a clarithromycin, amoxicillin, PPI-based triple therapy has been used as first line treatment by 261 (61%) physicians whereas only 2% of physicians used quadruple therapy.<sup>3</sup> In the present study, the main treatment ordered by both GPs and specialists was quadruple therapy which may be due to the increased recurrence rate and resistance to therapy in this region that necessitates the use of quadruple therapy.<sup>26</sup>

In the present study, most GPs and internists were informed of drug resistance while in Huang's study only 62% of GPs showed concern for bacterial resistance. Their study included GPs from Asia (69%), South America (63%) and Europe (70%) who showed greater concern than GPs from Oceania (35%), Africa (45%) and North America (52%).<sup>2</sup> In Ahmed's study, eradication of *H. pylori* was confirmed by 247 (57%) of physicians only in selected patients.<sup>3</sup>

One of the limitations of the present study is that it only reflects the approach of physicians who reside in Guilan Province and may not be representative of the entire country, although data from the current study is similar to other Iranian studies.

Overall, as compared to other studies, current knowledge and attitude of GPs is to some extent satisfactory, but more effort should be considered for better education of GPs and internists.

In this study, most physicians showed interest in participating in continuing medical education programs. This indicates the high prevalence of *H. pylori* infection and its related complications, physicians' daily contact with this infection, and adequate interest in obtaining more education in this regard.

The current information on the management of *H. pylori* infection has been useful for GPs

in Iran.

As a whole, there was a weak but significant correlation between physicians' mean knowledge and practice scores. Internists showed better mean knowledge and attitude scores than GPs. Internists have higher knowledge because they have performed more studies in this field, are experienced in practice because they have visited more patients with these complaints.

#### CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.

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