

## Helicobacter Pylori infection among dyspepsia patients in suburbs of Riyadh, Saudi Arabia

Talal Shakhs Alghamdi,<sup>1</sup> Tahir Ansari,<sup>2</sup> Atif Ali Bashir,<sup>3</sup> Mohammed Ali Batais,<sup>4</sup> Mohammed Fahad Aldhahi,<sup>5</sup> Mohammed Ayed Alanazi<sup>6</sup>

### Abstract

**Objective:** The objective of the study was to determine the current prevalence of Helicobacter pylori infection among Dyspepsia patients and correlate this with Endoscopic findings.

**Methodology:** A retrospective, descriptive facility-based study was conducted from June to December 2017 to estimate the prevalence of Helicobacter pylori among dyspepsia patients from Majmaah, Sudair, Zulfi and Shaqra areas of Riyadh region, Saudi Arabia. Four years data from January 2012 to December 2016 were reviewed by a checklist and analyzed by SPSS.

**Results:** Out of 1398 dyspepsia patients, 485 (34.7%) were positive and 913 (65.3%) were negative for H-Pylori infection. Majority of patients 1143 (81.7%) had gastritis, out of which, 457 (39.9%) of gastritis patients were H-pylori positive. The frequency of H-pylori infection was significantly higher among patients with gastritis ( $p < 0.001$ ). There was no statistically significant difference in the frequency of H-pylori infection among patients with erosion, ulcer, polyp and cancer ( $p > 0.05$ ).

**Conclusion:** The prevalence of H.Pylori was low as compared to other governorates in the kingdom and regional countries. Gastritis was dominating finding on upper gastrointestinal (GI) endoscopy.

**Keywords:** Helicobacter pylori, Prevalence, Dyspepsia, Riyadh region. (JPMA 70: 2174; 2020)

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### Introduction

Helicobacter pylori (H.pylori) is rapidly declining in developed countries.<sup>1</sup> The prevalence of infection remained high (>50%) in significant parts of the world. H. pylori expands the risk of developing other serious diseases, starting from peptic ulcer disease, non-cardiac gastric cancer, to B-cell non-Hodgkin's lymphoma.<sup>2</sup> The cost of care for the related disease could be substantially high, therefore, early eradication by using appropriate antibiotics is recommended. Infection is usually acquired in childhood; although the exact route is uncertain, once acquired, the infection persists for life unless treated. Lower socioeconomic status, utilization of outlet food, meat, non-processed drinking water and smoking are the influential causes for H. pylori.<sup>3</sup>

The overall prevalence of H. pylori infection, irrespective of time and age group, ranges from 30.6% to 82% in neighboring countries of the region showing variable results with declining trends in economic stable nations.<sup>4</sup> The infection is quite common with 54-62% of gastric

biopsies being positive in different areas of Saudi Arabia. The most frequent endoscopic diagnosis was gastritis associated with H. pylori in majority of patients.<sup>5</sup> Children have high prevalence in cities of Jeddah and Riyadh.<sup>6</sup> There was a significant relation between H. pylori infection and chronic recurrent abdominal pain.<sup>7</sup>

The prevalence of H.pylori is on the decline because of better hygiene, sanitation, clean water source, improved housing and educational level in numerous parts of developed nations. However, such a reduction has not been noticed for in most developing countries.<sup>8</sup> There is a rapid change in the living standards in Saudi Arabia and have resulted in a noticeable decrease in H. pylori transmission as reflected in different studies.<sup>9</sup>

Upper gastrointestinal endoscopy is the investigation in patients with longstanding dyspepsia.<sup>10</sup> H. pylori eradication has been one of the primary therapeutic strategies to reduce gastric cancer. The success of a gastric cancer prevention strategy depends on timing because the treatment must be introduced before the progression of gastric carcinogenesis.<sup>11</sup> To the best of our knowledge, no study available in this region, our research will help in answering the current prevalence, which is required for the early eradication of this infection and improved medical care. Therefore, the objective of this

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<sup>1,4</sup>Department of Clinical Sciences-Medicine, <sup>2</sup>Department of Clinical Sciences Medicine, <sup>3</sup>Department of Basic Sciences Pathology, <sup>5,6</sup>College of Medicine, Majmaah University, Almajmaah, Kingdom of Saudi Arabia.

**Correspondence:** Tahir Ansari. Email: [t.ansari@mu.edu.sa](mailto:t.ansari@mu.edu.sa)

study is to estimate the current burden of Helicobacter pylori infection among dyspepsia patients and to correlate the H.pylori infection with endoscopic findings.

## Methods

This is a retrospective, descriptive facility-based study conducted from June to December 2017; we reviewed the records of four years from January 2012 to December 2016 in King Khalid hospital, Almajmaah, a referral hospital in the region. The ethical review committee of Majmaah University approved the study (MUREC-May22/COM-2017/7), permission was also obtained from King Khalid hospital administration.

The study sample size was calculated at 95% level of confidence, assuming 50% prevalence of H.Pylori infection and 5% level of significance. A design effect of 2 was applied to expand the sample size with a purpose to capture variation in the various regions included in the study. The sample size was further inflated to 16% to adjust for the incomplete medical records; hence a final sample size of 1398 was obtained. Sudair, Majmaah, Zulfi and Shaqra regions referrals from primary health care center with long-standing symptoms of dyspepsia in outpatient clinics to this hospital. The diagnosis for H-Pylori was made by having an upper gastrointestinal endoscopy. An expert reported distinctive endoscopic features, based on the Sydney System and Biopsy specimens were collected from each patient at the three different sites for histopathology and H. Pylori detection.

Total enumeration of dyspepsia patient's records was included in the study. A pre-tested checklist was used to collect data. The list contained diagnosis and demographic data (age, sex and other demographic details). The data were analyzed using the SPSS-23 software. Descriptive statistics, including frequency distribution and percentages, were calculated. The chi-square test was applied to determine significant differences in the frequency of H-pylori infection in relation to patients' gender, nationality and endoscopic findings. P-value of less than 0.05 was considered statistically significant.

## Results

The total number of study participants was 1398, out of which 712 (51.1%) were males. The age of study participants was ranged from 11 to 95 years. Among 1398 study participants, 485 (34.69%) were positive for H-Pylori infection. Majority of all the dyspepsia patients records, 941 (67.3%) belonged to Zulfi region. Almost half of all the study participants, 49.2% (n=690) were between 20 to 39 years of age. Majority of the study participants (n=1199) (85.7%) were Saudi nationals (Table-1).

**Table-1:** Socio-demographic characteristics of the participants (n=1398).

| Socio-demographic Data |               | Frequency | %    |
|------------------------|---------------|-----------|------|
| Age                    | 0-19 years    | 141       | 10   |
|                        | 20 - 39 years | 690       | 49.3 |
|                        | 40-59 years   | 413       | 29.5 |
|                        | > 59          | 154       | 11   |
| Nationality            | Saudi         | 1199      | 85.7 |
|                        | Non-Saudi     | 199       | 14.2 |
| Gender                 | Male          | 715       | 51.1 |
|                        | Female        | 683       | 48.9 |

**Table-2:** Comparison of H-pylori infection burden on the basis of gender and Nationality (n=1398).

| Gender      | Positive n (%) | Negative n (%) | p-value |
|-------------|----------------|----------------|---------|
| Male        | 249 (34.8)     | 466 (65.2)     | >0.05   |
| Female      | 236 (34.6)     | 447 (65.4)     |         |
| Nationality | Saudi          | 779 (64.9)     | >0.05   |
|             | Non-Saudi      | 134 (67.3)     |         |

**Table-3:** Frequency of various gastrointestinal problems among study participants diagnosed/ identified on Endoscopy (n=1398).

| Endoscopic findings |         | (%) Frequency |
|---------------------|---------|---------------|
| Gastritis           | Absent  | 255 (18.3)    |
|                     | Present | 1143 (81.7)   |
| Erosion             | Absent  | 1291 (92.3)   |
|                     | Present | 107 (7.7)     |
| Ulcer               | Absent  | 1377 (98.5)   |
|                     | Present | 21 (1.5)      |
| Cancer              | Absent  | 1395(99.8)    |
|                     | Present | 03(0.2)       |
| Polyp               | Absent  | 1389(99.4)    |
|                     | Present | 09(0.6)       |

There was no statistically significant difference in the frequency of H-Pylori infection on the basis of gender and nationality (p>0.05) as shown in Table-2.

Table-3 shows frequency of various gastrointestinal problems among the study participants, diagnosed/ identified on endoscopy. Majority of the patients (81.8%) had gastritis, 7.7% of them were having erosion, while only 1.5% of these patients had ulcers and less than 1% had polyp and cancer.

Table-4 shows the association between endoscopic findings and H-pylori infection. Majority of the patients 1143 (81.74%) had gastritis. The frequency of H-pylori infection was significantly higher among patients with

**Table-4:** Association between endoscopic findings and H-pylori infection (n=1398).

| Endoscopic finding | H-pylori Infection |            | p-value |
|--------------------|--------------------|------------|---------|
|                    | Positive           | Negative   |         |
| <b>Gastritis</b>   |                    |            |         |
| Present            | 457 (40.0)         | 686 (60.0) | 0.00    |
| Absent             | 28(11.0)           | 227(89.0)  |         |
| <b>Erosion</b>     |                    |            |         |
| Present            | 29 (27.1)          | 78(72.9)   | 0.06    |
| Absent             | 456(35.3)          | 835(64.7)  |         |
| <b>Ulcer</b>       |                    |            |         |
| Present            | 06 (28.5)          | 15(71.5)   | 0.72    |
| Absent             | 479 (34.8)         | 898(65.2)  |         |
| <b>Cancer</b>      |                    |            |         |
| Present            | 00(0.0)            | 03(100.0)  | 0.89    |
| Absent             | 485(34.7)          | 910 (65.3) |         |
| <b>Polyp</b>       |                    |            |         |
| Present            | 01(11.1)           | 08 (88.8)  | 0.09    |
| Absent             | 484(34.8)          | 905(65.2)  |         |

gastritis ( $p < 0.001$ ). Conversely, 39.9% of gastritis patients were H-pylori positive. On the other hand, there was no significant difference in frequency of H-pylori infection among patients who had erosion, ulcer, polyp and cancer as compared to who did not have such findings on endoscopy ( $p > 0.05$ ).

## Discussion

There are many reasons for recurrent upper abdominal discomfort and pain including peptic ulcer disease, gastroesophageal reflux disease, malignancy, pancreatic or biliary diseases. Still, there are patients who have no definite structural or biochemical explanation for their symptoms, however, most commonly H-pylori infection has been implicated.<sup>13</sup> This study showed 34.7% of dyspepsia patients were having H.pylori infection; these patients had longstanding non-responding dyspepsia on conventional treatment. The prevalence is higher from a regional study in Oman that estimated prevalence of 30.1%, although age group was almost similar to our study.<sup>14</sup> Although our study showed less prevalence than what has been reported in recent past in other regions of Saudi Arabia,<sup>15</sup> nonetheless, similar to one recent study conducted in Riyadh.<sup>16</sup> This study finding might be attributed to better living standards and good hygienic condition in this region and as a result reduction in the infection prevalence. Nevertheless, our study did not explore and compare the burden of H.Pylori infection in relation to differences in environmental hygiene. There is great extent of infection in underdeveloped countries than industrialized nations 80-90% vs. 25% respectively, the most likely because of poor sanitation and substandard of hygiene.<sup>17</sup>

This study found no significant difference in the frequency of H.Pylori infection on the basis of gender and nationality ( $p > 0.05$ ). However, epidemiological studies conducted among the general populations have shown a male preponderance in infection rate by H pylori, although there are controversial, reports representing comparable rates.<sup>18</sup> Moreover, to the best of authors' knowledge, no studies have reported a female predominance. However, females are more vulnerable to develop gastric cancers after getting H pylori infection.<sup>19</sup>

Gastritis was most frequent finding on endoscopy. Our study reported that 39.9% of gastritis patients were H-pylori positive. This finding is similar to many developed countries like Japan and Italy but much higher than UK and USA, recently reported in a study that suggested the possible association between gastritis and H-pylori infection ( $p < 0.001$ ).<sup>20</sup> Acute gastritis results histologically in neutrophilic gastritis, with the passage of time, a gradual infiltration by different inflammatory cells, predominantly lymphocytes and this in association with transient hypochlorhydria lead to serious complication including malignancy.<sup>21</sup> Literature has shown improvement in gastritis and even reversal following eradication of the infection.<sup>22</sup>

Patients with erosion and ulcers with positive H.pylori are less in our study and we did not find a statistically significant difference in frequency of H.Pylori among those with positive endoscopic findings versus patients with negative endoscopic findings ( $p > 0.05$ ). The result is similar to a recently published study, where they did not find any statistically significant association between H.pylori and erosion.<sup>23</sup> The finding might be explained by the previous adequate treatment of H. pylori, the prevalence of this infection is changing and the proportion of ulcers that are not associated with H. pylori infection seems to be increasing. One of the reasons may be increased use of non-steroidal anti-inflammatory drugs (NSAIDs) in the general population.<sup>24</sup> However, our study did not collect information regarding use of NSAIDs.

Our study reported only three cases with gastric cancer and those were H pylori negative. Development of gastric cancer related to H pylori is multifactorial and depends upon infectious strain, genetic and environmental factors.<sup>25</sup> Literature supported that early H pylori treatment might provide strong clinical benefits by reversing the paraneoplastic lesion and even reduce the risk of gastric cancer in certain groups of patients.<sup>26</sup>

## Clinical Implication

Despite of low prevalence compared to another part of the region locally and nearby regional countries,<sup>5,27</sup> still

there is a need for early detection and eradication for H.pylori infection from the community. This could improve clinical outcome and prevent patients from severe complications like gastric cancer.

### Limitations

The present study had some limitations. We reviewed patients from four major cities of suburbs in Riyadh region, the detailed description of their symptoms and whether they received H-pylori eradication regimen is mostly not well documented. Therefore, our results on the estimated levels of infection prevalence might not be applied to the general population.

### Conclusion

The H.pylori was common among patients suffering from long-standing dyspepsia. However, the prevalence was low as compared to other governorates in the Kingdom and regional countries. Frequency of gastritis was significantly high among H.Pylori infected patients (p-value <0.05). This finding highlighted the importance of H. Pylori screening among patients with dyspepsia and gastritis in Saudi region.

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