

***Helicobacter pylori* Infection: Epidemiological, Clinical, and Therapeutic Profiles from a Prospective Study**

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: *Helicobacter pylori* infection is one of the most common infections worldwide. Understanding the epidemiology of *H. pylori* infection is an essential step in the development of appropriate public health measures. Various published and updated management guidelines reflect an evolution in the management of *H. pylori*-related pathologies, particularly with regard to indications, diagnostic tests and treatment. The aim of our work is to define the clinical, histological, therapeutic and evolutionary epidemiological profile of patients with *H. pylori* infection at the endoscopy center at Cheikh Khalifa Hospital Casablanca.

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Methods: This is a prospective, descriptive study, conducted between January 2024 and July 2024, including 86 patients with *H. pylori* infection, confirmed by an invasive or non-invasive test.

Results : We included 86 patients, of whom 58 were women and 28 men, giving an M/F sex ratio of 1/2. The mean age was 43, with extremes of 15 and 82. Infection was highest in the 20-39 age group ($p < 0.001$). Clinically, 45.3% of patients presented with epigastralgia and 13.9% with gastro-oesophageal reflux. In 69.7% of cases, a gastroesophageal fibroscopy (FOGD) was performed, while 30.3% of patients benefited from a non-invasive test. Epigastralgia was the main reason for endoscopic examination (32.5%). Erythematous gastritis was the most frequent endoscopic finding. Peptic ulcer was found in 8.3%, while gastric cancer was not observed in any patient.

HP eradication was observed in 76.1% of patients treated with concomitant quadruple therapy and 79.5% of patients treated with bismuth therapy ($p = 0.35$). No patient experienced severe side effects leading to discontinuation of treatment. Compliance was excellent in 93% of patients.

Conclusion: *H. pylori* infection is highly responsive, more so in young women than in men, found most often at the stage of non-atrophic gastritis, with similar efficacy of the two therapeutic protocols and few side effects.

Keywords: *Helicobacter pylori*; gastric diseases; epidemiology; prevalence.

1. INTRODUCTION

Helicobacter pylori (HP) infection is linked to various gastroduodenal diseases; “however, only approximately 20% of infected individuals develop severe diseases” [1]. “Research evidence indicates that *H. pylori* is responsible for 74% of non-cardia gastric cancer in developed countries and 78% in less developed countries” [2]. “The prevalence of *H. pylori* infection continues to vary strongly between developing countries and developed countries, and according to ethnicity, place of birth and socioeconomic factors among people living in the same country” [3]. “The major risk factors associated with *H. pylori* infection was poor socioeconomic status, crowded living conditions, smoking, higher number of siblings and a lower consumption of fruits” [4].

“*Helicobacter pylori* infection has been proved to be of great relevance to public health in unindustrialized countries, especially in low socioeconomic groups. An interesting study from the USA identified the degree of African ancestry as an independent predictor of *H. pylori* infection” [5]. “Therefore, understanding the epidemiology of *H. pylori* infection concerning the geographical distribution and sociodemographic characteristics is necessary to develop effective public health measures and prevent the spread of infection caused by this bacterium” [6].

H. pylori has proven to be a more complex pathogen than early research indicated.

The aim of our work is to define the clinical, histological, therapeutic and evolutionary

epidemiological profile of patients with *H. pylori* infection.

2. PATIENTS AND METHODS

Patients: This is a prospective, descriptive study, conducted between January 2024 and July 2024, at Cheikh Khalifa Hospital in Casablanca, including 86 patients with *H. pylori* infection, confirmed by an invasive or non-invasive test.

Inclusion criteria were 18 years of age or older, with confirmed *H. pylori* infection (by histology, 13C-urea respiratory test, stool antigen test and serology).

Patients were excluded if there had been an earlier attempt to *H. pylori* eradication or concomitant or recent (within 30 days) use of IPP, antibiotics, bismuth.

Studied variables: In this study, only the qualitative variables (age, sex, clinical, laboratory and therapeutic examination) were taken into account.

Statistical analysis: All the data collected was entered, processed and analyzed with the software Microsoft Excel 2017. The qualitative variables were described using percentages and the quantitative variables using averages and standard deviations. The different frequencies were compared using the chi-2 test. $p < 0.05$ was considered statistically significant.

3. RESULTS

Table 1 represents the demographic characteristics of the patients. Out of 86 patients

there were 28 male patients and 58 female patients, giving an M/F sex ratio of 1/2. The mean age was 43, with extremes of 15 and 82. The results show that all slices of age are affected by this infection and that the highest infection rate was found in the level of the age group 20-39 (p<0.001).

Clinically, 45.3% of patients presented with epigastralgia and 13.9% with gastro-oesophageal reflux.

Of 86 *H. pylori*-positive patients, 69.7% were *H. pylori* positive by histopathology and 26

underwent non-invasive testing. Of them, 12.8% were positive for the rapid urease test, 11.7% on stool antigen testing and 5.8% had a positive serology for *H. pylori* (Table 2).

Epigastralgia was the main reason for endoscopic examination (32.5%). Erythematous gastritis was the most frequent endoscopic finding (91.7%). Peptic ulcer was found in 8.3%, while gastric cancer was not observed in any patient (Fig. 1).

Histologically, non-atrophic gastritis was the most frequent histological lesion.

Table 1. Description of the sample under study by sex and age

Patients	Number	Percentage (%)
Gender	Female : 58	67,4
	Male : 28	32,5
Age range (years)	<20 years : 5	5,8
	20-39 years : 38	44,2
	40-59 years : 21	24,4
	≥60 years: 22	25,6

Table 2. The results of each *Helicobacter pylori* diagnostic test

Tests for <i>H. pylori</i> diagnosis	Number	Percentage (%)
Histology	60	69.7
Urea breath test	11	12.8
Serology	5	5.8
Stool antigen test	10	11.7

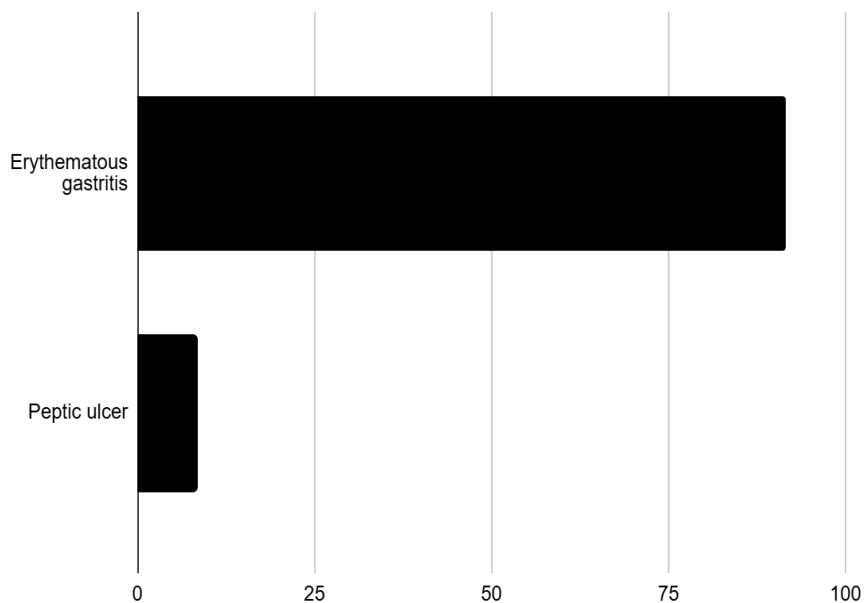


Fig. 1. Distribution of patients according to their gastric disease

The study of the impact of age showed that gastric ulcers appeared only from 30 years, unlike gastritis which manifested in 20 years. Of the 79 patients with gastritis, 43 were in the 20-39 age group. Of 7 cases of ulcers, 5 were between the ages of 40 and 59.

H. pylori eradication was observed in 76.1% of patients treated with concomitant quadruple therapy and 79.5% of patients treated with bismuth therapy ($p = 0.35$). No patient experienced severe side effects leading to discontinuation of treatment. Compliance was excellent in 93% of patients.

4. DISCUSSION

Helicobacter pylori infection is a major cause of morbidity and mortality worldwide. Infection invariably causes active chronic gastritis. In many people this may be clinically silent throughout life, but in a significant minority it results in gastroduodenal diseases, especially peptic ulcer disease, non-cardia gastric cancer and gastric mucosa-associated lymphoid tissue(MALT)lymphoma [7]. "Epidemiological studies published in the past year confirm that *H. pylori* is more common in poor areas where there is overpopulation and poor sanitation. Transmission of *H. pylori* is still not entirely clarified, but human-to-human spread through oral-oral or fecal-oral route is thought to be the most plausible" [8].

"The prevalence of *H. pylori* infection in Africa varies between countries" [9], the prevalence is 70.8% in Burundi, 63.8% in Morocco, 88% in Ghana, 66.12% in Egypt, respectively, and 54.5% in South Africa [10].

The present study confirms that the prevalence rate of *H. pylori* was more in females(67.4%) compared to males (32.5%), This female predominance was also found in the studies of Ankouane et al in Cameroon [11,12] and Essadik et al. [13] in Morocco, unlike some studies where a higher prevalence in males was observed.

However, we observed that the prevalence of *H. pylori* increases with age, as reported by other studies, with a maximum rate (44.1%) affecting the 20-39 age group. These observations were in agreement with the results of N. Lunet et al. [14], a Portuguese study who showed a high prevalence of infection at 73.9% between 18 and 30 years old. These results are consistent with recent estimates that Portugal has higher rates of *H. pylori* infection (86.4%).

Many techniques are used to diagnose *H. pylori* infection, in the present study, 30.3% of patients benefited from a non-invasive test, while in 69.7% of cases, a gastroesophageal fibroscopy (FOGD) was performed. Non-invasive methods are favored in certain situations. In Japan, Asaka et al. added the stool antigen test to the list of noninvasive methods given in the guidelines for *H. pylori* diagnosis [15]. Moreover, the Second Asian Pacific Consensus guidelines for *H. pylori* infection indicated that stool antigen test was an acceptable diagnostic tool, while urea breath test was the most accurate of the noninvasive methods and serology had a limited role in the management of *H. pylori* infection, due to its highly variable accuracy [16].

H. pylori is the cause of several digestive pathologies including gastritis which is often asymptomatic. Moroccan authors assume that *H. pylori* is indeed most often correlated to chronic atrophic gastritis with a prevalence of 95.56% [17]. These results are consistent with those found in our study.

None of this allows us to mention the diagnosis of *H. pylori* infection apart from its histological or bacteriological evidence but the argument of frequency should encourage us at least in case of gastroduodenal ulcer, to make a systematic eradication [18].

H. pylori is described as a microorganism that can easily acquire resistance to antimicrobial agents leading to increased prevalence [19]. Susceptibility testing should be then the method of choice in guiding the most appropriate cure [20].

In the present study, *H. pylori* eradication was observed in 76.1% of patients treated with concomitant quadruple therapy and 79.5% of patients treated with bismuth therapy ($p = 0.35$). According to the current Maastricht V consensus report, we used these two regimens, which recommend, in cases of high (> 15%) or unknown resistance to clarithromycin, To opt for bismuth quadruple therapy or a bismuth-free concomitant quadruple therapy as the first line of treatment [21].

Although our analysis was only descriptive, eradication rates remain difficult to compare or generalize because regimens vary according to the type of PPI, antibiotics used and other characteristics.

5. CONCLUSION

The findings of the study reveal that *H. pylori* infections are more common in females than males. Seroprevalence of *H. pylori* increases with increasing age; we also observed that 91.7% of the population infected with *H. pylori* suffered from gastritis, 54.4 % of which were in the same age group (20-39 years).

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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