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Prevalence of Helicobacter Pylori Among Outpatients at Al-Khadra Hospital, Tripoli: A Cross-Sectional Study

Abdubaki Mohamedn Assir [1]*

[1]Biomedical Research and Consulting Centex, Misurata University, Libya
Department of Medical Radiology, College of Medical Technology, Wadi Al Shati University, Wadi Al Shati, Libya

*Corresponding author: E-mail addresses: A.kirah@wau.edu.ly

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ABSTRACT

Background: Helicobacter pylori is one of the most common chronic bacterial infections worldwide and is strongly associated with gastritis, peptic ulcer disease, and gastric cancer. (Hooi JKY, et al.2017). **Objective:** To estimate the prevalence of H. pylori among outpatients at Al-khadra Hospital in Tripoli, Libya, and to identify associated epidemiological and clinical risk factors. Methods: Cross-sectional study (July–September 2025) of 100 adults; demographics and symptoms recorded; stool antigen tests used for diagnosis. **Results:** Overall prevalence was 46% (95% CI: 36.0–56.3). Infection was significantly associated with smoking (p=0.01) and epigastric pain (p=0.03), but not with gender or age ≥40 years. **Conclusion**: H. pylori remain a considerable public health burden in Tripoli; findings support early diagnostic and eradication strategies.

1. INTRODUCTION

According to the Kyoto global consensus . (Sugano K, et al2015), Helicobacter pylori (H. pylori) is a Gram-negative bacterium that colonizes the human gastric mucosa and is a major etiological agent of chronic gastritis, peptic ulcer disease, mucosa-associated lymphoid tissue (MALT) lymphoma, and gastric adenocarcinoma (Malfertheiner P, et al2017) (Hunt RH, et al2014)]. Since its discovery in the 1980s, H. pylori has been the focus of extensive research due to its high prevalence and substantial disease burden.

Globally, more than half of the population is estimated to harbor H. pylori (Hooi JKY, et al.2017), although prevalence varies widely depending on geographical, socioeconomic, and hygienic factors (Megraud F, et al2015) (Li BZ, et al. 2023). In many high-income regions, prevalence has declined—often to below 30%—largely attributed to improvements in sanitation, socioeconomic conditions, and antibiotic exposure (Megraud F, et al2015) (Li BZ, et al. 2023)In contrast, developing countries continue to report higher rates, frequently exceeding 60–70% [1,5]. A landmark meta-analysis by Hooi et al. reported a global pooled prevalence of 44%, with the highest rates observed in Africa and South America (Hooi JKY, et al.2017). More recently, Li et al. (2023) highlighted a downward trend over the past two decades, particularly in high-income settings (Li BZ, et al. 2023). Within North Africa, reported prevalence remains relatively high, including estimates of 52% in Egypt (Khalifa MM, et al2010), 55% in Tunisia [Ben Mansour N, et al. 2018], and 58% in Algeria [Djidjou PK, et al2019]. In sub-Saharan Africa, prevalence is even higher in several countries, such as Nigeria and Ethiopia [Smith SI, et al2010] [Taye B, et al2014]. By contrast, Western European countries have reported substantially lower rates; for example, a prevalence of 22% has been recorded in Spain ([Gisbert JP, et al2010). Despite the breadth of global data, evidence from Libya is limited, with most available reports being single-center, hospital-based studies with small samples, which restricts generalizability. This gap underscores the need for updated local estimates. Accordingly, the present study aimed to determine the prevalence of H. pylori among patients attending gastroenterology clinics in Tripoli and to examine associated demographic, clinical, and behavioral risk factors.

2. Materials and Methods

Study design: Cross-sectional.
Setting: outpatients at Al-khadra Hospital in Tripoli.
Period: July - September 2025.
Sample size: 100 adult patients (≥18 years).
Inclusion criteria: All eligible patients able to provide stool samples.
Exclusion criteria: Use of antibiotics within 4 weeks, use of proton pump inhibitors (PPIs) within 2 weeks, or acute gastrointestinal bleeding.
Data collection: Structured questionnaire covering age, gender, smoking habits, symptoms (epigastric pain, heartburn, bloating), and medication history.
Laboratory procedure: Stool antigen immunochromatographic test (ICT) was performed using the Artron One-Step H. pylori Antigen Test (Artron Laboratories, Canada), according to the manufacturer's instructions (Artron Laboratories. 2025).
A result was considered positive when both control and test lines were clearly visible; any invalid cassette was repeated.
Statistical analysis: Statistical analysis included Student's t-test (or Mann–Whitney U where appropriate) for continuous variables, and Chi-square/Fisher's exact test for categorical variables. A p-value < 0.05 was considered statistically significant.

3. ETHIC APPROVAL

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Informed consent was obtained from all participants prior to enrollment. Confidentiality and anonymity of participants' data were strictly maintained throughout the study.

4. Results

A total of 100 patients were included, with a mean age of 36.8 ± 12.2 years; approximately 50% were female. Overall, 46 patients (46%) tested positive for H. pylori.
Prevalence was significantly higher among smokers (62%) compared to non-smokers (39%, p=0.01). Patients reporting epigastric pain showed higher infection rates (58%) compared to those without pain (37%, p=0.03). No statistically significant differences were found according to gender (p=0.32) or age group (≥40 vs <40 years, p=0.27).

Table 1: Baseline characteristics of study participants.

Characteristic	Total (n=100)	H. pylori Positive (n=46)	H. pylori Negative (n=54)	p-value
Mean age (years)	36.8 ± 12.2	35.9 ± 11.8	37.6 ± 12.6	0.27
Female (%)	50	48	52	0.32
Smokers (%)	40	62	39	0.01*
Epigastricpain (%)	49	58	37	0.03*
Heartburn (%)	31	35	28	0.41

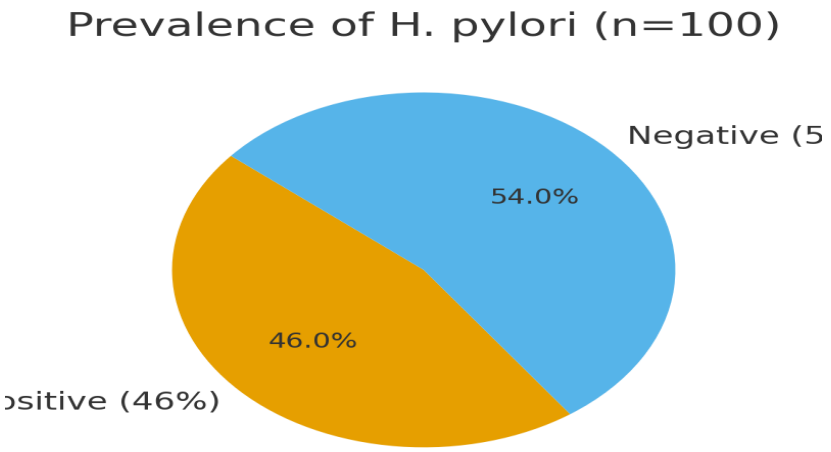

Figure 1: Distribution of H. pylori results (positive/negative).

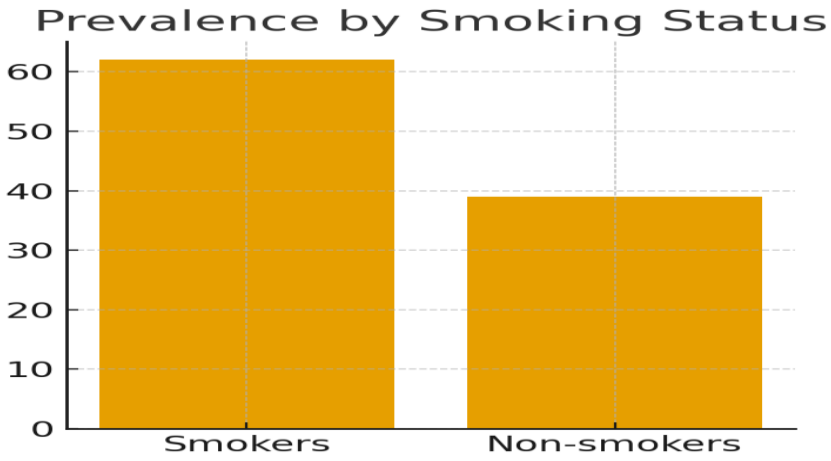

Figure 2: Prevalence of H. pylori by smoking status.

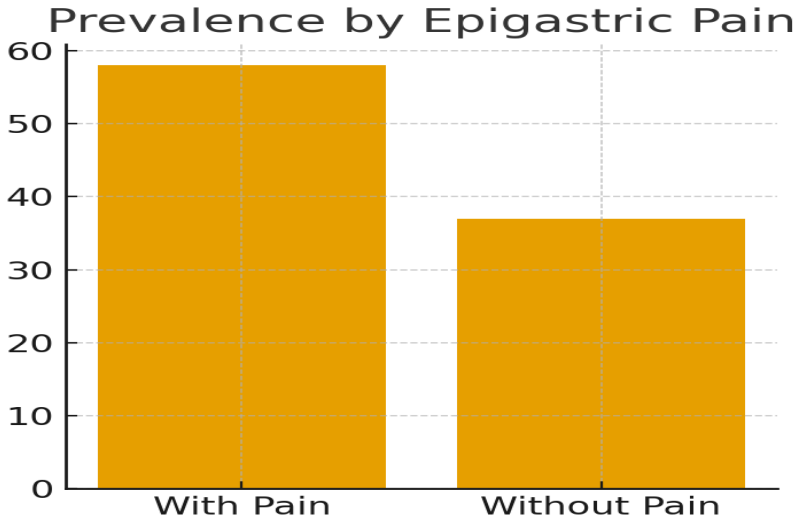

Figure 3: Prevalence of H. pylori by presence of epigastric pain.

5. Discussion

This study found that the prevalence of H. pylori among gastroenterology outpatients in Tripoli was 46%. This estimate is consistent with the global pooled prevalence of 44% reported by Hooi et al 2017 and aligns with results from neighboring North African countries such as Egypt (52%) (Khalifa MM, et al2010), and Tunisia (55%)[Ben Mansour N, et al. 2018].By contrast, prevalence was higher in sub-Saharan Africa, reaching over 70% in Nigeria[Smith SI, et al2010] and Ethiopia (Taye B, et al2014)]. while Western European countries reported significantly lower rates, such as 22% in Spain (Gisbert JP, et al2010).

The association observed between smoking and H. pylori infection is noteworthy. Previous studies have demonstrated that smoking impairs gastric mucosal defenses and reduces the efficacy of eradication therapy[Ford AC, et al. 2014]. In our study, smokers had significantly higher prevalence compared to non-smokers. This finding underscores the need for targeted health education regarding smoking cessation in the context of gastrointestinal disease prevention. Epigastric pain was also significantly associated with infection, which is consistent with clinical observations from sub-Saharan Africa where dyspeptic symptoms strongly correlate with H. pylori positivity[Smith SI, et al2010] [Taye B, et al2014]. Nevertheless, symptoms are not specific, and guidelines caution against relying on symptoms alone for diagnosis[Chey WD, et al.2017]

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From a public health perspective, the relatively high prevalence in Tripoli highlights the need for systematic screening strategies. International guidelines such as Maastricht V(Malfertheiner P, et al2017)and ACG[Chey WD, et al.2017] recommend non-invasive diagnostic methods, including stool antigen and urea breath tests, as first-line approaches. The WHO further emphasizes early detection to prevent the long-term sequelae of chronic infection, particularly gastric cancer[World Health Organization2019].

Strengths of this study include the use of a reliable diagnostic test that detects active infection and the collection of detailed clinical and demographic data. However, several limitations must be acknowledged. The sample size was relatively small (n=100), and the study was conducted in a single urban location, which may not reflect the national prevalence across Libya. Moreover, socioeconomic factors, dietary habits, and environmental exposures were not systematically assessed, which could confound the observed associations.

Future studies should aim to include larger, multicenter samples to provide nationally representative data. Such research would also benefit from incorporating molecular typing of H. pylori strains, which could help elucidate differences in virulence and antibiotic resistance patterns.

6. Conclusion

This study demonstrated that approximately half of gastroenterology outpatients at Al-khadra Hospital in Tripoli were infected with H. pylori. Smoking and epigastric pain were identified as significant associated factors. These findings highlight the need for expanded screening and public health interventions, and call for multicenter national studies to better assess the burden of H. pylori infection across Libya.

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