The Egyptian Journal of Hospital Medicine (January 2025) Vol. 98, Page 241- 246

A Study of Clinical and Endoscopic Profile of Patient Presenting with Functional Dyspepsia and Evaluation of Therapeutic Approaches

Sherif Ahmed Megahed Ahmed *, Marwa Momen Mohamed Fahmy, Osama Ashraf Ahmed, Ahmed Samir Allam

Internal Medicine and Gastroenterology Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt.

*** Corresponding Author:** Sherif Ahmed Megahed Ahmed,

E-mail: sherifmegahed1001@gmail.com, **Phone No.:** (+2) 01207157339

ABSTRACT

Background: Functional dyspepsia is a prevalent gastrointestinal disorder affecting approximately 25% of the global population annually. It is characterized by symptoms such as epigastric pain, bloating, and nausea, which significantly impact healthcare costs and quality of life. Functional dyspepsia is diagnosed based on the Rome IV criteria, which exclude structural diseases as the cause of symptoms.

Objective: This study aimed to evaluate the diagnostic approaches for dyspeptic patients and to assess the effects of various management methods, including Helicobacter pylori (H. pylori) eradication, on symptom improvement.

Patients and methods: A prospective cohort study was conducted at the Gastrointestinal Unit of El-Mataria Teaching Hospital over six months. One hundred patients (mean age 50.25 ± 15.32 years; 55% females) diagnosed with functional dyspepsia underwent comprehensive clinical evaluation, laboratory testing, and endoscopic assessment. The study analyzed the impact of H. pylori eradication therapy on symptom severity using a visual analogue scale (VAS) before and two weeks after treatment.

Results: H. pylori infection was detected in 75% of patients. Significant endoscopic findings included chronic superficial gastritis (54%), chronic atrophic gastritis (30%), and esophageal lesions (14%). The mean VAS score significantly decreased from 3.15 ± 0.76 to 1.00 ± 0.82 following treatment ($p < 0.001$). A statistically significant association was observed between H. pylori infection and endoscopic findings ($p = 0.014$). No significant correlations were found between endoscopic findings and personal data or risk factors.

Conclusion: Our study underscored the importance of H. pylori eradication in improving symptoms severity and advocate for individualized diagnostic and therapeutic approaches.

Keywords: Functional dyspepsia, Helicobacter pylori, endoscopy, Rome IV criteria, treatment outcomes.

INTRODUCTION

Dyspepsia affects approximately 25% of the population annually, resulting in significant healthcare costs and lost productivity. It is characterized by symptoms such as epigastric pain, bloating, early satiation, and nausea, which can be categorized into reflux-like, ulcer-like, and dysmotility-like patterns [1]. In cases where no specific cause can be identified, the condition is referred to as functional or non-ulcer dyspepsia (NUD). According to the Rome IV criteria, functional dyspepsia is defined by persistent symptoms lasting for at least three months, with onset at least six months prior, in the absence of structural disease to explain the symptoms [2].

Endoscopic evaluation is recommended for patients over 55 years or those presenting with alarm features such as weight loss, bleeding and dysphagia, or persistent early satiety, to exclude malignancy and other organic pathologies [3]. Conversely, younger patients without alarm symptoms may undergo a trial of proton pump inhibitors (PPIs) or Helicobacter pylori (H. pylori) testing before endoscopy. H. pylori, a key contributor to gastritis, peptic ulcers, and gastric malignancies, is a central focus in dyspepsia management [4]. However, rising antibiotic resistance and declining success rates of traditional eradication therapies necessitate exploration of alternative treatment strategies.

This study aimed to evaluate the diagnostic approaches for dyspeptic patients and to compare the effects of different management methods on functional dyspepsia.

PATIENTS AND METHODS

Study design: This prospective cohort study was conducted over six months at the Gastrointestinal Unit of El-Mataria Teaching Hospital. The study included 100 outpatients with dyspepsia, selected through a randomized sampling method. Both male and female patients aged 18 to 85 years were eligible for inclusion if they were diagnosed with functional dyspepsia based on the Rome IV criteria, which was confirmed through upper gastrointestinal endoscopy.

Inclusion criteria: Patients aged between 18 and 85 years with a confirmed diagnosis of functional dyspepsia as per Rome IV criteria.

Exclusion criteria: Individuals unfit for endoscopy due to cardiac, pulmonary, or renal diseases, those with dyspepsia secondary to other conditions such as diabetes mellitus, or patients with liver cirrhosis, renal impairment, malignancies and pregnancy or lactation.

Clinical and diagnostic methods: All patients underwent comprehensive clinical assessment, including detailed history-taking and physical examination with a focus on the gastrointestinal system. Demographic data, risk factors for dyspepsia [e.g., habits and NSAID use, or previous proton pump

Received: 03/10/2024
Accepted: 02/12/2024

inhibitor (PPI) use], and symptoms were recorded. Patients also completed a simplified questionnaire to confirm the presence of cardinal symptoms such as epigastric pain, nausea, and vomiting. This assessment was repeated during follow-up to evaluate symptom resolution post-treatment.

Laboratory investigations included a complete blood count, liver and renal function tests, and H. pylori stool antigen testing. Imaging studies, such as abdominal ultrasonography and upper or lower gastrointestinal endoscopy, were performed when necessary. Endoscopy was conducted under conscious sedation following overnight fasting, and findings such as gastritis, peptic ulcers, and other abnormalities were documented. Biopsy samples from the gastric antrum and body were collected for histopathological examination and urease testing.

Histopathological and symptom assessment: All biopsy specimens were examined by a blinded expert pathologist following the updated Sydney classification. Pathologic changes such as chronic inflammation, gastritis activity, atrophy, H. pylori density, intestinal metaplasia, and malignancy were documented. Symptom severity, including nausea, vomiting, postprandial fullness, early satiety, bloating, and pain, was evaluated using a 10-point visual analogue scale (VAS) before and two weeks after treatment [5]. These assessments were conducted by a trained physician who was blinded to the specific treatment methods used.

Ethical Considerations: The study was done after being accepted by The Research Ethics Committee, Ain Shams University. All patients provided written informed consents prior to their enrolment. The consent form explicitly outlined their agreement to participate in the study and for the publication of data, ensuring protection of their confidentiality and privacy. This work has been carried out in accordance with The Code of Ethics of World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis:

The data were analyzed using the IBM SPSS software package (version 20.0; IBM Corporation, Armonk, NY). Qualitative data were summarized as numerical values and percentages, while the Kolmogorov-Smirnov test was applied to evaluate the normality of data distribution. Quantitative data were described using the range (minimum and maximum), mean, standard deviation, median, and interquartile range (IQR). Statistical significance was set at a 5% level. The Chi-square test was used for categorical variables to compare distinct groups, the paired t-test was applied to normally distribute quantitative variables for comparing two repeated measurements, and the one-way ANOVA test was utilized to assess differences among multiple study groups with normally distributed quantitative variables.

RESULTS

Initially, 124 participants were assessed for eligibility. Of these, 24 individuals were excluded, including 17 participants who did not meet the inclusion criteria and 7 who declined to participate. There were no exclusions due to other reasons. Consequently, a total of 100 participants were included in the study (Figure 1).

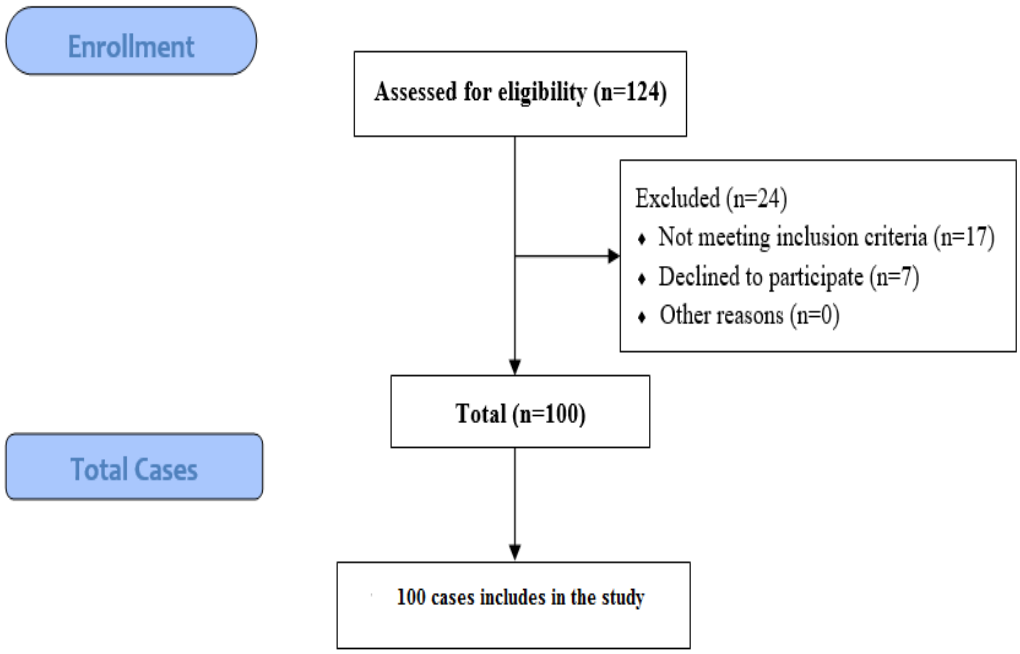

Figure (1): Flowchart of studied patients.

Distribution of the studied cases according to personal data, risk factors, and symptoms were shown in table (1).

Table (1): Distribution of the studied cases according to personal data, risk factors, and symptoms

Parameter	**n** (%)
Age (Years)	50.25 ± 15.32
Sex (Female)	55 (55.0%)
Sex (Male)	45 (45.0%)
BMI (kg/m^2)	24.22 ± 3.45
Smoking	38 (38.0%)
NSAIDs Intake	41 (41.0%)
Epigastric Pain	58 (58.0%)
Epigastric Burning	29 (29.0%)
Nausea and Vomiting	21 (21.0%)
Bloating	59 (59.0%)
Weight Loss	5 (5.0%)
Anemia	7 (7.0%)
Postprandial Fullness	19 (19.0%)
Early Satiety	26 (26.0%)
Belching	19 (19.0%)

BMI: Body Mass Index; NSAIDs: Nonsteroidal Anti-Inflammatory Drugs.

Distribution of the studied cases according to endoscopic findings are shown in table (2).

Table (2): Distribution of the studied cases according to endoscopic findings

	Subjects (n = 100)	
	No.	%
Esophageal lesions	14	14.0
Reflux esophagitis Class A	11	11.0
Reflux esophagitis Class B	2	2.0
Barrett's esophagus	1	1.0
Gastric lesions	84	84.0
Chronic atrophic gastritis	30	30.0
Chronic superficial gastritis	54	54.0
Peptic ulcer	2	2.0
Gastric ulcer	2	2.0

Data were presented as frequency (%)

According to H. pylori, there were 25 (25%) with negative H. pylori and 75 (75%) with positive H. pylori. There was a statistically significant reduction in VAS scores before and after treatment for H. pylori. The mean VAS score decreased from 3.15 ± 0.76 pre-treatment to 1.00 ± 0.82 post-treatment (t = 30.029, p < 0.001) (Table 3).

Table (3): Comparison between VAS data pre and post operation

	VAS		**t**	**P**
	Pre-treatment *H. pylori*	**Post-treatment *H. pylori***		
Range	2 – 4	0 – 2	30.029	<0.001
Mean ± SD	3.15 ± 0.76	1 ± 0.82		

Data are presented as mean ± SD, SD: Standard Deviation, *: Significant as P-value < 0.5

There was a statistically significant relation between endoscopic findings and epigastric pain. Among patients with esophageal lesions, 64.2% (9/14) had epigastric pain, compared to 48.8% (41/84) in those with gastric lesions and 100% (2/2) in those with peptic ulcers (p = 0.022) (Table 4).

Table (4): Relation between endoscopic findings, personal data, risk factors, and symptoms

	Endoscopic finding						**Test of Sig.**	**p**
	Esophageal lesions (n=14)		**Gastric lesions (n=84)**		**Peptic ulcer (n=2)**			
Age (Years)								
Range	35 – 75		25 – 74		41-46		1.629	0.201
Mean ± SD	52.2 ± 13.05		51.08 ± 15.3		43.5± 2.5			
Sex	No.	%	No.	%	No.	%		
Female	5	35.7	49	58.3	1	50.0	χ^2=	0.392
Male	9	64.3	35	42.2	1	50.0	1.873	
Size or BMI								
Range	18.7 – 34.4		18.9 – 31.6		18.7 – 24.5		1.148	0.347
Mean ± SD	24.11 ± 4.6		24.17 ± 3.2		21.6±2.9			
Risk factors								
Smoking	5	38.5	33	32.9	0	0.0	0.407	0.816
NSAIDs intake	6	46.2	35	40.0	0	0.0	2.965	0.227
Symptoms								
Epigastric pain	9	64.2	41	48.8	2	100	7.673	0.022*
Epigastric burning	6	42.9	21	25.0	1	50	2.144	0.342
Nausea and vomiting	3	21.4	16	19.0	1	50	0.138	0.934
Bloating	8	57.1	46	54.8	1	50	0.095	0.954
Weight loss	1	7.1	4	4.8	0	0	0.620	0.733
Anemia	0	0.0	6	7.1	2	100	1.393	0.498
Postprandial fullness	2	14.3	15	17.9	1	50	0.298	0.862
Early satiety	3	21.4	19	22.6	1	50	2.609	0.271
Belching	2	14.3	16	19.0	0	0	0.411	0.814

SD: **Standard deviation,** χ^2: **Chi square test, t: student t-test,** p: p value for comparing between studied groups, *: Statistically significant at $p \leq 0.05$

There was a statistically significant relation between endoscopic findings and H. pylori infection. Among patients with esophageal lesions, 76.1% (11/16) were H. pylori positive, compared to 82.3% (62/83) in those with gastric lesions and 100% (2/2) in those with peptic ulcers (p = 0.014) (Table 5).

Table 5: Relation between endoscopic finding and H. pylori

	Endoscopic finding						χ^2	**p**
	Esophageal lesions (n=16)		**Gastric lesions (n=83)**		**Peptic ulcer (n=1)**			
H. pylori	No.	%	No.	%	No.	%		
Negative	3	23.1	22	17.7	0	0	8.498	0.014*
Positive	11	76.1	62	82.3	2	100		

χ^2: **Chi square test,** p: p value for comparing between studied groups *: Statistically significant at $p \leq 0.05$

DISCUSSION

Dyspepsia affects approximately 25% of the population annually, leading to significant healthcare costs and productivity loss. It encompasses a range of upper gastrointestinal symptoms, including epigastric pain, bloating, heartburn, and nausea, classified into reflux-like, ulcer-like, and dysmotility-like categories. Functional dyspepsia, or NUD, is diagnosed according to Rome IV criteria, which require symptoms persisting for at least three months without structural disease [1, 6]. Helicobacter pylori plays a critical role in gastritis, peptic ulcers, and gastric malignancies, but rising antibiotic resistance has reduced the efficacy of traditional triple therapy [7]. This study aimed to evaluate diagnostic approaches for dyspepsia and compare the effectiveness of different management strategies in patients with functional dyspepsia.

The mean age of the studied cases was 50.25 ± 15.32 years (range: 21–75), with 55% females and 45% males. The mean BMI was 24.22 ± 3.45 (range: 18.7–34.4). There was no statistically significant relationship between endoscopic findings and personal data. Similarly, **Gado *et al.*** [8] reported a mean age of 43 ± 15 years among their cohort, with significant endoscopic lesions being more frequent in older age groups. In contrast, **Desai *et al.*** [9] found the most common age group to be 30–39 years (30.38%) with a mean age of 40.04 ± 14.34 years, noting that dyspepsia prevalence increases with age due to changes in gastric motility and secretion.

Among the studied cases, 33% were smokers, and 41% reported NSAID use, with no significant relationship between these risk factors and endoscopic findings. **Desai *et al.*** [9] observed a male predominance in dyspepsia cases, likely due to higher tobacco use and societal disparities in healthcare access. **Gado *et al.*** [8] noted that 32.14% of patients had a history of smoking and 27.71% reported NSAID use, with higher prevalence among those with alarm symptoms. While **Desai *et al.*** [9] found a significant association between dyspepsia and tobacco consumption, the association with NSAID use varied across studies, potentially reflecting differences in dietary and social habits.

Among the studied cases, the most common symptom was bloating (59%), followed by epigastric pain (58%), early satiety (26%), and epigastric burning (29%). Less frequent symptoms included nausea and vomiting (21%), postprandial fullness (19%), belching (19%), anemia (7%), and weight loss (5%). A statistically significant relationship was observed between endoscopic findings and epigastric pain. **Desai *et al.*** [9] similarly identified epigastric pain as the most prevalent symptom, with peptic ulcer disease (25.95%) and erosive gastro-duodenitis (23.42%) being the most common benign lesions, particularly among patients presenting with alarm symptoms like hematemesis and melena. These findings align with **Badi *et al.*** [10], who reported epigastric pain as the most common symptom (79.2%) in their cohort. **Faintuch *et al.*** [11] noted that gastrointestinal bleeding, a less common alarm symptom, occurred in 5% of cases, while peptic ulcer prevalence was 13%, and malignancy was 2%. Interestingly, over 40% of functional dyspeptic patients presented with alarm symptoms, though 75% of ulcer patients did not, highlighting the variability in symptom presentation and its diagnostic significance.

Among the studied cases, endoscopic findings revealed esophageal lesions in 14% of patients, including reflux esophagitis class A (11%), reflux esophagitis class B (2%), and Barrett's esophagus (1%). Gastric lesions were observed in 84% of patients, with 54% having chronic superficial gastritis and 30% chronic atrophic gastritis. **Desai *et al.*** [9] reported esophagitis in 4.43% of their cohort, predominantly classified as Los Angeles grade B (57.14%), while endoscopic findings in their study were normal in 43.67% of cases. Peptic ulcer disease accounted for 25.92%, erosive gastro-duodenitis for 23.42%, and UGI malignancy for 3.16%, with additional rare findings such as hiatus hernia, gastric polyps, and Dieulafoy's lesions. Similarly, **Gado *et al.*** [8] identified significant pathologies in 35% of patients, with peptic ulcer, esophagitis, and erosive gastro-duodenitis found in 18%, 14%, and 8% of cases respectively, and noted a higher prevalence among older patients. **Badi *et al.*** [10] reported clinically significant findings in 91.8% of their cohort, with esophagitis (33.1%) as the most common esophageal abnormality, gastritis (65.5%) as the predominant gastric finding, and duodenitis (11.7%) as the leading duodenal lesion. Gastric ulcers were observed in 4.6%, duodenal ulcers in 5.9%, and gastric carcinoma in only 0.54%, with H. pylori detected in 35.6% of cases.

In the current study, 75% of patients tested positive for H. pylori, while 25% were negative, with a statistically significant relationship between H. pylori status and endoscopic findings. A highly significant improvement was observed in VAS scores after treatment. Similarly, **Gado *et al.*** [8] reported that 52% of patients with gastric or duodenal ulcers tested positive for H. pylori, though the sample size for H. pylori testing was limited. **Xinias *et al.*** [12] highlighted a high prevalence of H. pylori infection (54%), noting a tenfold increased likelihood of gastric mucosal lesions in infected individuals and improvements in GERD symptoms following eradication. **Felga *et al.*** [13] emphasized that the high prevalence of H. pylori in resource-limited settings, coupled with the cost and complexity of eradication treatments (88% efficiency), challenges the viability of a "test and treat" strategy for dyspepsia. They suggested that empirical treatment for young patients without alarm symptoms might be a more practical approach in such regions, given the constraints of healthcare resources.

STUDY LIMITATIONS

This study was conducted at a single center with a relatively small sample size, which may limit the applicability of its findings to broader populations. The

Received: 03/10/2024
Accepted: 02/12/2024

short follow-up period did not allow for an assessment of long-term outcomes. Additionally, the study relied on conventional diagnostic methods without incorporating advanced molecular or genetic testing for H. pylori, which might have provided more precise insights.

CONCLUSION

Our study demonstrated a significant relationship between H. pylori infection and endoscopic findings in patients with functional dyspepsia and highlighted the efficacy of eradication therapy in symptom improvement. These results reinforced the importance of incorporating H. pylori testing and targeted treatment strategies in managing functional dyspepsia, while emphasizing the need for further research to address diagnostic and therapeutic challenges.

Financial support and sponsorship: Nil.
Conflict of Interest: Nil.

REFERENCES

1. **Harer K, Hasler W (2020)**: Functional Dyspepsia: A Review of the Symptoms, Evaluation, and Treatment Options. Gastroenterol Hepatol (N Y), 16: 66-74.
2. **Pinto-Sanchez M, Yuan Y, Hassan A *et al.* (2017)**: Proton pump inhibitors for functional dyspepsia. Cochrane Database Syst Rev., 11: Cd011194.
3. **Ibrahim L, Basheer M, Khoury T *et al.* (2024)**: Yield of alarm features in predicting significant endoscopic findings among hospitalized patients with dyspepsia, World J Gastroenterol., 30: 3210-20.
4. **Mégraud F, Lehours P (2007)**: Helicobacter pylori detection and antimicrobial susceptibility testing. Clin Microbiol Rev., 20: 280-322.
5. **Jensen P, Chen C, Brugger M (2003)**: Interpretation of visual analog scale ratings and change scores: a reanalysis of two clinical trials of postoperative pain. The Journal of Pain, 4: 407-14.
6. **Black C, Paine P, Agrawal A *et al.* (2022)**: British Society of Gastroenterology guidelines on the management of functional dyspepsia. Gut, 71: 1697-723.
7. **Thung I, Aramin H, Vavinskaya V *et al.* (2016)**: Review article: the global emergence of Helicobacter pylori antibiotic resistance. Aliment Pharmacol Ther., 43: 514-33.
8. **Gado A, Ebeid B, Abdelmohsen A *et al.* (2015)**: Endoscopic evaluation of patients with dyspepsia in a secondary referral hospital in Egypt. Alexandria Journal of Medicine, 51: 179-84.
9. **Desai B, Mahanta N (2018)**: A study of clinico-endoscopic profile of patient presenting with dyspepsia. Clinical Epidemiology and Global Health, 6: 34-8.
10. **Badi A, Naushad V, Purayil N *et al.* (2020)**: Endoscopic Findings in Patients With Uninvestigated Dyspepsia: A Retrospective Study From Qatar. Cureus, 12: e11166.
11. **Faintuch J, Silva F, Navarro-Rodriguez T *et al.* (2014)**: Endoscopic findings in uninvestigated dyspepsia. BMC Gastroenterol. 14: 19.
12. **Xinias I, Maris T, Mavroudi A *et al.* (2013)**: 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. Pediatr Rep., 5: e3.
13. **Felga G, Silva FM, Barbuti RC *et al.* (2010)**: Clarithromycin-based triple therapy for Helicobacter pylori treatment in peptic ulcer patients. J Infect Dev Ctries., 4: 712-6.