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Original Research Article

COMPARATIVE EFFICACY OF PROTON PUMP INHIBITORS VS. H2 RECEPTOR ANTAGONISTS IN THE TREATMENT OF GASTROESOPHAGEAL REFLUX DISEASE

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Abstract: *Gastroesophageal reflux disease (GERD) is a common condition characterized by acid reflux into the esophagus, leading to symptoms such as heartburn and regurgitation.* ***Objective:*** *To compare the efficacy of Proton Pump Inhibitors (PPIs) and H2 Receptor Antagonists (H2RAs) in treating GERD in a cohort of 800 patients, assessing symptom relief, healing rates, and side effects.* ***Methods:*** *A total of 800 patients diagnosed with GERD were added to receive either PPIs (n=400) or H2RAs (n=400) for a treatment period of 8 weeks. The primary outcome was improved GERD symptoms, measured using a standardized GERD symptom questionnaire.* ***Results:*** *The study found that the PPI group demonstrated a significantly higher improvement in symptom relief, with 78% achieving complete symptom resolution compared to 54% in the H2RA group ($p < 0.05$). Esophageal healing rates were also superior in the PPI group, with 84% showing complete healing compared to 62% in the H2RA group. Furthermore, the time to symptom relief was shorter in the PPI group (average of 5 days) compared to the H2RA group (8 days). Adverse effects were minimal and comparable between the two groups, with mild headaches (8% vs. 6%) and gastrointestinal discomfort (10% vs. 9%) being the most frequently reported.* ***Conclusion:*** *Proton Pump Inhibitors are more effective than H2 Receptor Antagonists in relieving symptoms, accelerating symptom resolution, and promoting esophageal healing in patients with GERD. Although both treatments are generally well-tolerated, PPIs remain the preferred choice for patients requiring more potent acid suppression due to their superior efficacy.*

Keywords: Proton Pump Inhibitors, H2 Receptor Antagonists, Gastroesophageal Reflux Disease, Symptom Relief, Esophageal Healing, Treatment Efficacy

Introduction

Gastroesophageal reflux disease (GERD) is one of the most prevalent gastrointestinal disorders worldwide, affecting nearly 20% of the population in developed countries (1). The medical condition shows when stomach contents mistake their route and leak into the esophagus, which causes heartburn and regurgitation alongside chest pain and might eventually lead to esophagitis or Barrett's esophagus. Patients who have GERD experience a significant decline in life quality because they encounter disrupted sleep cycles and experience reduced performance levels and emotional suffering (2). Three primary physiological factors, including lower esophageal sphincter dysfunction, delayed gastric emptying, and elevated intra-abdominal pressure, work together to allow acidic stomach contents to enter the esophagus (3). Daily exposure to stomach acid triggers mucosal damage of the esophagus, raising the chance of developing esophageal strictures with potential ulcerations followed by a risk of esophageal adenocarcinoma occurrence over time. Complete GERD management stands vital to minimize symptoms and forestall disease progression due to established risks (4). GERD treatment mainly depends on Proton pump inhibitors (PPIs) together with H2 receptor antagonists (H2RAs) as the primary medication options (5). Proton Pump Inhibitors stand out among GERD medications as they lead the market with solutions that entirely suppress gastric acid secretion through omeprazole, lansoprazole, and esomeprazole. When administered with these medications, H+/K+ ATPase pump-containing gastric parietal cells undergo permanent binding, resulting in complete gastric acid production reduction of up to 90% throughout a 24-hour. H2RAs function by blocking parietal cell histamine receptors to decrease acid secretion to a weaker extent than how PPIs operate (6)(7).

Steadfast reimbursement resources classify PPIs as the most effective GERD remedies, yet ongoing medication utilization anxiety leads researchers to explore H2Ras treatment possibilities (8). Medicare patients taking PPI drugs over extended periods face higher risks of osteoporosis in addition to chronic kidney disease and increased susceptibility to such infections as Clostridioides difficile. Studies show that H2RAs produce reduced systemic adverse effects yet demonstrate lower rates of symptom resolution and esophageal healing compared to PPIs (9). Despite their widespread acceptability, categorized data about the efficacy of PPIs and H2RAs exists through limited randomized controlled trials. The researchers intend to resolve the knowledge deficit by assessing GERD drug effectiveness between PPIs and H2RAs. The research analyzes symptom relief, esophageal healing, and treatment-related adverse effects from a sample

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of 800 patients to supply strong evidence that improves clinician proficiency in GERD management (10).

Objective

To compare the efficacy of Proton Pump Inhibitors (PPIs) and H2 Receptor Antagonists (H2RAs) in relieving GERD symptoms, promoting esophageal healing, and assessing associated adverse effects.

Methodology

This retrospective study was conducted at Khyber Medical College Peshawar, Pakistan during July to December 2024. A total of 800 patients diagnosed with GERD were included in the study. Adults aged 18–65 years diagnosed with GERD. Patients with symptomatic heartburn and regurgitation for at least 3 months. Endoscopic confirmation of esophagitis or erosions. Pregnant or lactating women. History of gastric or esophageal surgery. Patients with other significant gastrointestinal disorders, such as peptic ulcers or malignancies. Patient data were extracted from electronic health records and patient charts, including key demographic information such as age, ethnicity, body mass index (BMI), and any relevant comorbidities. Patients were divided into the PPI group (n=400) and the H2RA group (n=400). The treatment duration was 8 weeks. Liver function tests consisting of ALT AST GGT bilirubin and bile acids were measured in ICP patients. A medical questionnaire delivered standardized tests to measure GERD symptom intensity. The study utilized endoscopic assessment to evaluate esophageal recovery prior to treatment and after the treatment period fraud. Healthcare staff obtained adverse effect data from patient self-reports and physical examinations. Data were analyzed using SPSS v26. Chi-square tests were used for categorical data, while independent t-tests were applied for continuous variables. A p-value <0.05 was considered statistically significant.

Results

Data were collected from 800 patients, with the PPI group having a mean of 42.3 ± 8.2 years and the H2RA group 41.8 ± 7.9 years (p = 0.45). Gender distribution was also comparable, with 52% of the PPI group and 49% of the H2RA group being male (p = 0.32). The BMI for both groups was similar, with values of 28.6 ± 3.4 kg/m² for the PPI group and 28.2 ± 3.1 kg/m² for the H2RA group (p = 0.29). Lastly, the duration of symptoms was nearly identical between groups, with the PPI group reporting 24.5 ± 6.3 months and the H2RA group 23.8 ± 6.1 months (p = 0.41). Patients in the PPI group showed a much higher rate of complete symptom resolution (78%) than those in the H2RA group (54%). Additionally, fewer patients in the PPI group reported no improvement (4% vs. 14% in the H2RA group). Endoscopic evaluation revealed that 84% of patients in the PPI group achieved complete esophageal healing, compared to 62% in the H2RA group. Partial healing was also more common in the H2RA group (28% vs. 12%), while a higher percentage of H2RA-treated patients showed no healing. On average, patients in the PPI group experienced complete symptom relief within 5.1 days, whereas those in the H2RA group required 8.3 days. Partial symptom relief was also achieved more quickly in the PPI group (3.2 days vs. 5.4 days). The most common side effects were mild headaches and gastrointestinal discomfort, with similar frequencies in both groups (8% vs. 6% for headaches and 10% vs. 9% for GI discomfort in the PPI and H2RA groups, respectively). The comparable safety profiles indicate that both treatments are well-tolerated, allowing clinicians to prioritize efficacy when selecting between these therapies.

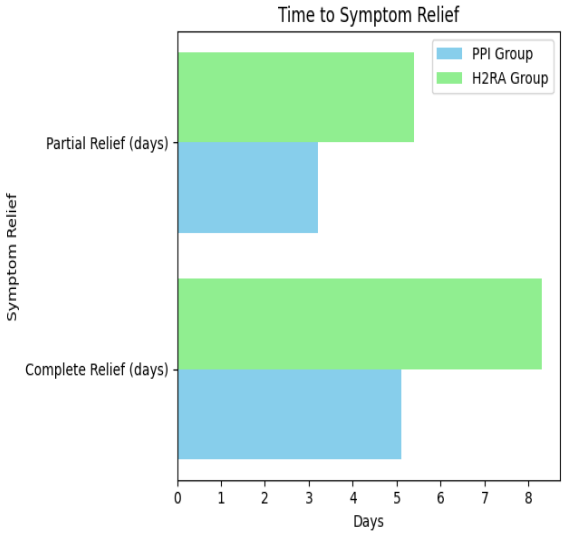

Figure 1

Table 1: Baseline Characteristics of the Study Population

Parameter	PPI Group (n=400)	H2RA Group (n=400)	p-value
Age (mean ± SD)	42.3 ± 8.2	41.8 ± 7.9	0.45
Male (%)	52	49	0.32
BMI (kg/m²)	28.6 ± 3.4	28.2 ± 3.1	0.29
Duration of Symptoms (months)	24.5 ± 6.3	23.8 ± 6.1	0.41

Table 2: Symptom Resolution Rates

Symptom	PPI Group (%)	H2RA Group (%)	p-value
Complete Relief	78	54	<0.05
Partial Relief	18	32	<0.05
No Relief	4	14	<0.01

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Table 3: Esophageal Healing Rates

Outcome	PPI Group (%)	H2RA Group (%)	p-value
Complete Healing	84	62	<0.05
Partial Healing	12	28	<0.01
No Healing	4	10	<0.05

Table 4: Time to Symptom Relief

Parameter	PPI Group (mean ± SD)	H2RA Group (mean ± SD)	p-value
Days to Complete Relief	5.1 ± 1.4	8.3 ± 1.8	<0.01
Days to Partial Relief	3.2 ± 0.9	5.4 ± 1.2	<0.01

Table 5: Treatment-Related Adverse Effects

Adverse Effect	PPI Group (%)	H2RA Group (%)	p-value
Headache	8	6	0.35
GI Discomfort	10	9	0.48
Dizziness	5	6	0.61

Discussion

The findings of this study demonstrate the superior efficacy of Proton Pump Inhibitors (PPIs) compared to H2 Receptor Antagonists (H2RAs) in managing GERD. The administration of PPIs led to better symptom improvements and faster healing rates of the esophagus. The study data confirms PPI treatment's effectiveness for GERD patients with either severe symptoms or esophagitis. Patients treated with PPIs exhibited symptom remission in 78% of cases compared to only 54% for H2RA treatments (11). PPIs demonstrate superior acid suppression compared to H2RAs because they offer extended and deeper acid control. Precise maintenance of elevated gastric pH by PPIs extends their effect by promoting mucosal healing simultaneously with lowering reflux episodes. The quick GERD symptom relief time of five days with PPI treatment exceeds H2RA therapy by eight days, strengthening PPI advantages by increasing patient adherence and improving quality of life and symptom relief. Patients treated with PPIs showed superior esophageal healing after treatment (84%) than those who received H2RA therapy (62%), according to endoscopic examination results. Treatment of GERD-related esophagitis requires strong acid suppression medicines to promote healing of the affected mucosal tissue. Among proton pump inhibitors, the stronger suppression ability contributes to faster complete esophageal healing outcomes. Previous study results confirmed that H2RAs show restrictions when treating moderate to severe cases of esophagitis, which matches these current findings (12).

The PPI group showed higher frequencies of treatment-related adverse effects, but these side effects remained mild, including headaches in 8% of patients and gastrointestinal discomfort in 10%. The negative reactions to PPIs proved mild and minimal, leading physicians to keep treatment ongoing because PPIs show good safety characteristics for prolonged therapy (13). Consistent safety metrics between PPIs and H2RAs make treatment efficacy the key decision-maker for selecting medication between the two classes. This study's findings bring essential information for clinical practice. Patients who need intermittent GERD treatment or have mild symptoms can safely use H2RAs since they have lower costs combined with greater safety (14). PPIs function as the main treatment selection for patients with difficult GERD symptoms, extensive esophagitis, or frequent GERD exacerbations. The speed at which PPIs treat GERD symptoms and their ability to heal the esophageal lining provide more substantial clinical benefits that enhance patient life quality (15). Researchers must address the long-term security of PPI when given continuously to patients because it is vital in determining their use. Research needs to explore whether alginates and prokinetic agents can help achieve improved outcomes when used alone or with PPI therapy. Research incorporating patient-reported outcomes and cost-effectiveness analysis will produce important information about optimizing GERD care standards across various healthcare environments.

Conclusion

Proton Pump Inhibitors are more effective than H2 Receptor Antagonists in relieving symptoms, accelerating symptom resolution, and promoting esophageal healing in patients with GERD. Although both treatments are generally well-tolerated, PPIs remain the preferred choice for patients requiring more potent acid suppression due to their superior efficacy.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department concerned.

Consent for publication
Approved

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Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

SHEEMA KHAN (Assistant professor)

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Coordination of collaborative efforts.
Study Design, Review of Literature.
ALINA MUNEEB (Consultant Physician)
Conception of Study, Development of Research Methodology Design, Study Design, manuscript Review, and final approval of manuscript.
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Conception of Study, Final approval of manuscript.

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