



ORIGINAL ARTICLE

Prescription Pattern, Treatment Response, and Safety Profile of Acid-Suppressive Therapy in Patients with Gastroesophageal Reflux Disease: A Cross-Sectional Study

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Abstract

Background: Gastroesophageal reflux disease (GERD) is a common acid-related disorder characterized by troublesome heartburn, regurgitation, retrosternal discomfort, and extra-esophageal symptoms. Proton pump inhibitors are the mainstay of pharmacological treatment. However, inappropriate duration, incorrect timing of administration, polypharmacy, and unsupervised long-term use may affect treatment response and safety.

Aim: To evaluate the prescription pattern, clinical response, adherence to lifestyle advice, and safety profile of pharmacological therapy among patients with gastroesophageal reflux disease.

Materials and Methods: A cross-sectional observational study was conducted among 300 adult patients diagnosed clinically with GERD and receiving treatment in outpatient and inpatient departments. Data were collected using a structured proforma containing demographic profile, symptoms, duration of illness, body mass index, associated risk factors, prescribed drugs, dose, timing, duration, concurrent medication, lifestyle advice, symptom response, and reported adverse effects. Treatment response was assessed after four weeks using improvement in heartburn and regurgitation frequency. Data were analyzed using descriptive statistics and chi-square test.

Results: Of 300 patients, 174 (58.0%) were male and 126 (42.0%) were female. Heartburn was the most frequent symptom, followed by regurgitation and epigastric discomfort. Proton pump inhibitors were prescribed in 278 (92.7%) patients. Pantoprazole was the most frequently prescribed PPI, followed by omeprazole and rabeprazole. Once-daily therapy was used in 228 (76.0%) patients, while twice-daily therapy was used in 50 (16.7%) patients. Lifestyle advice was documented in 142 (47.3%) prescriptions. Complete symptom relief was reported by 176 (58.7%) patients, partial relief by 88 (29.3%), and inadequate response by 36 (12.0%). Inadequate response was significantly associated with irregular medication timing, obesity, late-night meals, tobacco use, and absence of documented lifestyle advice.

Conclusion: Proton pump inhibitors were the predominant therapy for GERD, with pantoprazole being most commonly prescribed. Most patients showed improvement after treatment; however, a substantial proportion had partial or inadequate response. Proper timing of PPI intake, weight management, avoidance of late-night meals, tobacco cessation, and periodic review of long-term treatment are important for improving outcomes.

Keywords: Acid Suppression, Gastroesophageal Reflux Disease, Pharmacology, Proton Pump Inhibitors, Prescription Pattern, Treatment Response.

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1 | INTRODUCTION

Gastroesophageal reflux disease is a condition that develops when reflux of gastric contents into the esophagus causes troublesome symptoms or complications. Typical symptoms include heartburn and regurgitation, while some patients may present with chest discomfort, chronic cough, hoarseness, sore throat, globus sensation, or sleep disturbance. (1)

GERD is a common gastrointestinal disorder and contributes substantially to reduced quality of life, reduced work productivity, repeated healthcare visits, and long-term medicine use. Its prevalence varies between populations and is influenced by obesity, smoking, dietary pattern, physical inactivity, increasing age, and use of certain medicines. (2)

The pathophysiology of GERD is complex. It involves impaired lower esophageal sphincter function, transient lower esophageal sphincter relaxations, hiatal hernia, delayed gastric emptying, reduced esophageal clearance, altered mucosal resistance, and visceral hypersensitivity. (3)

Population-based studies have shown that obesity, increasing age, smoking, and NSAID use are associated with a higher prevalence of reflux symptoms. (4) Lifestyle modification therefore remains an important component of management, especially in overweight patients and those with food-related or nocturnal symptoms.

Proton pump inhibitors are the most effective drugs for reducing gastric acid secretion and are widely used in the treatment of erosive esophagitis, non-erosive reflux disease, and frequent heartburn. (5) They provide more sustained acid suppression than antacids and histamine-2 receptor antagonists. (6) Appropriate use of PPIs requires correct timing, preferably before meals, adequate duration, review of adherence, and assessment of alarm symptoms. Lifestyle measures such as weight reduction, avoiding late meals, smoking cessation, head-end elevation, and avoiding personal dietary triggers may improve symptom control. (7)

The present study was conducted to evaluate prescription pattern, symptom response, lifestyle advice, and treatment-related safety concerns among

patients with GERD receiving pharmacological therapy.

2 | MATERIALS AND METHODS

This cross-sectional observational study was conducted in the Department of Pharmacology in collaboration with the Medicine and Gastroenterology outpatient. The study included 300 adult patients diagnosed clinically with gastroesophageal reflux disease.

Patients aged 18 years and above who reported typical GERD symptoms such as heartburn and regurgitation occurring at least once weekly, or who had been diagnosed with GERD by the treating physician, were included. Patients with active gastrointestinal bleeding, known malignancy, severe dysphagia, odynophagia, unexplained weight loss, persistent vomiting, severe anemia, pregnancy-related reflux, and patients unwilling to participate were excluded.

Patients were enrolled consecutively after written informed consent. Clinical diagnosis was based on symptom profile, physician assessment, response to acid-suppressive therapy, and available endoscopic findings where applicable.

Data were collected using a structured proforma. The proforma included age, gender, occupation, education, duration of symptoms, body mass index, smoking history, alcohol intake, dietary habits, meal timing, sleep pattern, use of NSAIDs, previous acid-suppressive therapy, and presence of comorbid conditions such as diabetes mellitus, hypertension, obesity, asthma, anxiety, or chronic pain disorders.

GERD symptoms were recorded as heartburn, regurgitation, epigastric discomfort, chest discomfort, dysphagia, chronic cough, throat irritation, hoarseness, nausea, and disturbed sleep. The frequency of

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symptoms was categorized as occasional, weekly, or daily.

Prescription details were collected from patient case records and prescriptions. Information was recorded regarding type of PPI, dose, frequency, timing in relation to meals, duration of treatment, use of histamine-2 receptor antagonist, prokinetic drug, antacid, alginate preparation, mucosal protective agent, and other concurrent medicines.

Patients were asked whether they received counseling regarding weight reduction, avoiding late-night meals, reducing tea or coffee intake, avoidance of smoking and alcohol, head-end elevation during sleep, avoiding tight clothing, and avoiding foods that precipitated reflux symptoms.

Treatment response was assessed after four weeks of therapy. Complete response was defined as absence or near-complete resolution of heartburn and regurgitation. Partial response was defined as reduction in symptom frequency or intensity without complete relief. Inadequate response was defined as persistent troublesome symptoms despite prescribed treatment.

Adherence was assessed by asking patients about missed doses, timing of intake, discontinuation of therapy, and use of medicines only when symptoms occurred. Patients were categorized as having regular adherence when they reported taking medication as prescribed for at least five days per week.

Adverse effects reported during treatment, including headache, diarrhea, constipation, nausea, abdominal discomfort, dizziness, and perceived weakness, were recorded. Patients using PPIs for more than eight weeks were assessed for review of treatment need and documentation of follow-up advice.

Data were entered into Microsoft Excel and analyzed using descriptive statistics. Frequencies, percentages, mean, and standard deviation were calculated. Chi-square test was used to compare treatment response with selected risk factors. A p value less than 0.05 was considered statistically significant.

Institutional Ethics Committee approval was obtained prior to commencement of the study. Confidentiality of patient information was maintained.

3 | RESULTS

A total of 300 patients with GERD were included. The mean age was 43.8 ± 13.6 years. Most patients belonged to the 31–50 years age group.

Heartburn was the most frequently reported symptom. Regurgitation and epigastric discomfort were also common. A considerable number of patients reported nocturnal symptoms or sleep disturbance.

Proton pump inhibitors were prescribed to 278 patients. Pantoprazole was the most commonly used PPI, followed by omeprazole and rabeprazole.

Most patients received once-daily therapy. Combination therapy with a prokinetic agent was prescribed in selected patients, especially those with postprandial fullness or persistent regurgitation.

Lifestyle advice was documented in less than half of the prescriptions. Advice regarding avoidance of late-night meals was more common than counseling for weight reduction or tobacco cessation.

After four weeks of treatment, 176 patients achieved complete symptom relief, while 88 had partial improvement. Inadequate response was noted in 36 patients.

Inadequate response was more frequent among patients with obesity, tobacco use, irregular medication timing, late-night meals, and poor adherence.

Adverse effects were mild and were reported by 42 patients. Headache and gastrointestinal complaints were the commonest reported events.

4 | DISCUSSION

In the present study, heartburn and regurgitation were the predominant symptoms of GERD. Proton pump inhibitors were prescribed to 92.7% of patients, with pantoprazole being the most commonly used drug. Complete symptom relief was observed in 58.7% patients, while 12.0% had inadequate response. In a study by Sandhu and Fass et al., PPIs were identified as the most effective pharmacological treatment for GERD and were reported to provide symptom improvement in a substantial proportion of patients with erosive and non-erosive reflux disease. (8) Similarly, PPIs were the most frequently

TABLE 1:

Characteristic	Number (%)
Male	174 (58.0)
Female	126 (42.0)
Age 18–30 years	64 (21.3)
Age 31–50 years	142 (47.3)
Age 51–60 years	58 (19.3)
Age above 60 years	36 (12.0)
Body mass index ≥ 25 kg/m ²	126 (42.0)
Tobacco use	72 (24.0)
Regular late-night meals	118 (39.3)
Frequent tea or coffee intake	132 (44.0)
NSAID use in previous month	68 (22.7)

TABLE 2:

Clinical Symptom	Number (%)
Heartburn	248 (82.7)
Regurgitation	206 (68.7)
Epigastric discomfort	154 (51.3)
Postprandial fullness	102 (34.0)
Night-time symptoms	92 (30.7)
Chest discomfort	64 (21.3)
Chronic cough or throat irritation	46 (15.3)
Nausea	42 (14.0)
Hoarseness of voice	18 (6.0)

TABLE 3:

Pharmacological Therapy	Number (%)
Pantoprazole	142 (47.3)
Omeprazole	72 (24.0)
Rabeprazole	46 (15.3)
Esomeprazole	18 (6.0)
Histamine-2 receptor antagonist without PPI	12 (4.0)
Antacid or alginate only	10 (3.3)

TABLE 4:

Prescription Pattern	Number (%)
Once-daily PPI	228 (76.0)
Twice-daily PPI	50 (16.7)
PPI plus prokinetic	82 (27.3)
PPI plus antacid or alginate	64 (21.3)
PPI plus mucosal protective agent	28 (9.3)
Duration prescribed for 4–8 weeks	196 (65.3)
Duration not clearly documented	42 (14.0)

TABLE 5:

Lifestyle Advice Documented	Number (%)
Avoid late-night meals	142 (47.3)
Weight reduction	94 (31.3)
Avoid tobacco and alcohol	86 (28.7)
Avoid dietary triggers	104 (34.7)
Head-end elevation during sleep	58 (19.3)
No lifestyle advice documented	126 (42.0)

TABLE 6:

Treatment Response	Number (%)
Complete response	176 (58.7)
Partial response	88 (29.3)
Inadequate response	36 (12.0)

TABLE 7:

Associated Factor	Complete/Partial Response n=264	Inadequate Response n=36	p value
Obesity or BMI ≥ 25 kg/m ²	98 (37.1)	28 (77.8)	<0.01
Tobacco use	54 (20.5)	18 (50.0)	<0.01
Regular late-night meals	88 (33.3)	30 (83.3)	<0.01
Irregular PPI timing	46 (17.4)	24 (66.7)	<0.01
No lifestyle advice documented	98 (37.1)	28 (77.8)	<0.01
NSAID use	52 (19.7)	16 (44.4)	0.01

TABLE 8:

Reported Adverse Effect	Number (%)
Headache	14 (4.7)
Diarrhea	10 (3.3)
Constipation	8 (2.7)
Nausea	6 (2.0)
Abdominal discomfort	4 (1.3)

prescribed therapy in the present study, and most patients showed complete or partial improvement. In a study by Singh et al., a structured weight-loss programme resulted in reduction or resolution of GERD symptoms in overweight and obese participants. (9) In the present study, inadequate response was significantly more common among overweight and obese patients, indicating the importance of weight-management counseling. In a study by Bytzer et al., partial response to standard-dose PPI therapy was observed in a significant proportion of patients

with GERD. (10) Similarly, 29.3% of patients in the present study experienced only partial symptom relief, showing that PPI therapy alone may not fully control symptoms in all patients.

Kahrilas et al., demonstrated that incomplete response to PPI therapy was linked to factors such as poor adherence, incorrect timing of medication, functional symptoms, non-acid reflux, and incorrect diagnosis. (11) In the present study, irregular PPI timing and poor adherence were significantly associated with inadequate response. In a study by Vakil et

al., direct comparisons of PPIs showed that standard doses of different PPIs have broadly similar efficacy for symptom relief in GERD. (12) In the present study, pantoprazole, omeprazole, rabeprazole, and esomeprazole were all used, with drug selection appearing to depend mainly on availability and prescriber preference.

In a study by Graham and Tansel et al., the authors concluded that PPIs can be used interchangeably according to potency and that twice-daily dosing may be helpful in selected patients with persistent symptoms. (13) In the present study, twice-daily PPI therapy was prescribed in 16.7% patients, mainly in those with severe or persistent reflux symptoms. In a study by Freedberg et al., long-term PPI use was associated with concerns regarding nutrient deficiency, infection, kidney disease, and other adverse outcomes, although many associations were based on observational evidence. (14) In the present study, short-term adverse effects were mild; however, periodic review of long-term therapy remains important. Moayyedi et al., showed pantoprazole use over three years was not associated with major adverse effects except a possible increase in enteric infections. (15) The present study also found only mild short-term adverse effects, mainly headache, diarrhea, constipation, and nausea.

The study has limitations. It was a single-centre cross-sectional study, and endoscopy was not available for all patients. Drug adherence was self-reported. Long-term follow-up, pH monitoring, and assessment of complications such as Barrett's esophagus were not included.

5 | CONCLUSION

GERD was commonly managed with proton pump inhibitors, particularly pantoprazole. Most patients showed symptomatic improvement, but partial and inadequate response remained clinically important. Obesity, late-night meals, tobacco use, NSAID intake, incorrect timing of medication, and lack of lifestyle counseling were associated with poorer response. Rational GERD management should include appropriate PPI prescription, correct timing of intake, review of adherence, lifestyle modification,

weight management, and reassessment of patients with persistent symptoms.

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