Research Paper

Clinical Outcomes and Recurrence Patterns in Patients Treated for Acute GERD Symptoms in Emergency Department

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ABSTRACT

Background

Gastroesophageal reflux disease (GERD) is a common gastrointestinal problem. Recurrence of symptoms remains an important clinical issue. This study assessed clinical outcomes and recurrence patterns among patients treated for acute GERD symptoms in the emergency department.

Methods

This prospective observational cohort study was conducted at the Department of Emergency Medicine, King Edward Medical University/Mayo Hospital, Lahore, Pakistan, from July 2025 to December 2025. A total of 120 patients presenting with acute GERD symptoms were enrolled through consecutive sampling. Baseline demographic and clinical data were recorded. Patients were followed for three months to assess symptom recurrence. Data were analyzed using SPSS version 26. Logistic regression analysis was performed to identify predictors of recurrence.

Results

Out of 120 enrolled patients, 115 completed follow-up. The mean age was 44.1 ± 12.8 years and 58.3% were males. Heartburn was the most common symptom, reported in 85.2% patients. Symptom improvement at discharge was observed in 87.0% cases, while 10.4% required hospital admission. Recurrence of symptoms occurred in 35 (30.4%) patients during follow-up. Patients with recurrence had significantly higher body mass index (30.2 ± 4.0 vs 27.0 ± 3.8 kg/m², $p<0.001$), smoking frequency (51.4% vs 26.3%, $p=0.009$), diabetes mellitus (40.0% vs 17.5%, $p=0.008$), and previous GERD history (60.0% vs 26.3%, $p=0.001$). Multivariable analysis identified obesity, smoking, diabetes mellitus, and previous GERD history as independent predictors of recurrence.

Conclusion

Most patients showed clinical improvement after emergency treatment. However, nearly one-third developed recurrent symptoms. Obesity, smoking, diabetes mellitus, and previous GERD history were significant predictors of recurrence and should be considered during patient management and follow-up.

Keywords: Gastroesophageal reflux disease; Emergency department; Recurrence; Obesity; Smoking.

How to cite this article: Culiolis CP, Zhuo IK, Vashisth MK, Gu Z, Mahmood H. Clinical Outcomes and Recurrence Patterns in Patients Treated for Acute GERD Symptoms in Emergency Department. Int J Drug Deliv Technol. 2026;16(55s): 1268-1272. DOI: 10.25258/ijddt.16.55s.121

Source of support: Nil.

Conflict of interest: None.

Introduction

Gastroesophageal reflux disease (GERD) is one of the most common gastrointestinal disorders worldwide [1]. It occurs when gastric contents reflux into the esophagus and produce troublesome symptoms such as heartburn, acid regurgitation, chest discomfort, and sour taste in the mouth [2]. The global prevalence of GERD is increasing and it has become an important health problem because of

its effect on quality of life and healthcare burden [3]. Many patients seek urgent medical care when symptoms become severe or mimic cardiac chest pain [4].

Several factors have been reported to be linked with GERD development and recurrence of symptoms [5]. Obesity is considered one of the strongest risk factors because increased abdominal pressure promotes reflux of gastric contents into the esophagus [6]. Smoking is another important factor. It may reduce lower esophageal sphincter pressure and impair normal acid clearance from the esophagus [7]. Similarly, diabetes mellitus may contribute to reflux symptoms through delayed gastric emptying and autonomic dysfunction [8]. Lifestyle factors such as spicy food intake, unhealthy dietary habits, and poor compliance with treatment may also worsen symptoms and increase recurrence risk [9].

Although GERD has been extensively studied, limited local data are available regarding clinical outcomes and recurrence patterns among patients presenting to emergency departments in Pakistan. Most available studies focus on outpatient populations, while emergency presentations are less frequently evaluated. Identification of factors associated with recurrence may help clinicians recognize high-risk patients and improve discharge planning and follow-up strategies. Therefore, the present study was conducted to evaluate clinical outcomes and recurrence patterns among patients treated for acute GERD symptoms in the emergency department and to identify factors associated with symptom recurrence after initial treatment.

Methodology

This prospective observational cohort study was conducted at the Department of Emergency Medicine, King Edward Medical University/Mayo Hospital, Lahore, Pakistan, over a period of six months from July 2025 to December 2025. The study was carried out in accordance with the STROBE guidelines for observational research [10]. Ethical approval was obtained from the Institutional Review Board of King Edward Medical University, Lahore (Ref No. KEMU/IRB/2025-EM-178).

The sample size was calculated using OpenEpi version 3.01 by assuming a recurrence rate of 30% among patients treated for acute gastroesophageal reflux disease (GERD) symptoms, with a 95% confidence level and 7% margin of error. The minimum required sample size was 120 patients.

Adult patients aged 18 years and above presenting to the emergency department with acute GERD symptoms, including heartburn, acid regurgitation, sour taste in the mouth, or reflux-related chest discomfort, were included. Patients with confirmed cardiac causes of chest pain, peptic ulcer disease, gastrointestinal malignancy, pregnancy, previous upper gastrointestinal surgery, severe systemic illness, or inability to complete follow-up were excluded.

After informed consent, baseline demographic and clinical information was recorded, including age, gender, body mass index, smoking status, dietary habits, comorbidities, symptom duration, and previous history of GERD. All patients received standard treatment as decided by the attending physician. Clinical outcomes included symptom improvement at discharge, need for hospital admission, length of emergency department stay, and symptom recurrence. Symptom improvement was assessed by patient-reported relief of presenting complaints before discharge. Recurrence was defined as the return of GERD symptoms requiring medical consultation, medication use, or emergency department revisit within three months after the initial visit. Follow-up was performed through scheduled outpatient visits or telephone calls at one and three months.

Possible confounding factors including age, obesity, smoking, diabetes mellitus, hypertension, dietary habits, and previous GERD history were recorded and adjusted during analysis. Patients lost to follow-up or having more than 10% missing data were excluded from the final analysis.

Data were analyzed using SPSS version 26. Continuous variables were presented as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. Independent sample t-test or Mann–Whitney U test was used for continuous variables and Chi-square or Fisher's exact test for categorical variables. Multivariable logistic regression analysis was performed to identify factors associated with recurrence. A p-value less than 0.05 was considered statistically significant.

Results

A total of 120 patients were enrolled in the study. During the three-month follow-up period, 115 patients completed follow-up and were included in the final analysis. Five patients were lost to follow-up. The mean age of the participants was 44.1 ± 12.8 years. Males constituted 67 (58.3%) patients while females were 48 (41.7%).

The baseline demographic and clinical characteristics of the study population are shown in Table 1. Most patients were either overweight or obese. A previous history of GERD was present in more than one-third of the participants. Heartburn was the most common presenting symptom, followed by acid regurgitation. The mean duration of symptoms before presentation was 4.7 ± 2.5 days (Table 1).

Table 1: Baseline demographic and clinical characteristics of study participants (n=115)

Variable	Value
Age (years), Mean ± SD	44.1 ± 12.8

Male gender, n (%)	67 (58.3)
Female gender, n (%)	48 (41.7)
BMI (kg/m²), Mean ± SD	28.0 ± 4.1
Normal BMI (<25 kg/m²), n (%)	36 (31.3)
Overweight (25–29.9 kg/m²), n (%)	51 (44.3)
Obese (≥30 kg/m²), n (%)	28 (24.4)
Current smokers, n (%)	39 (33.9)
Diabetes mellitus, n (%)	28 (24.3)
Hypertension, n (%)	35 (30.4)
Previous history of GERD, n (%)	42 (36.5)
Symptom duration before presentation (days), Mean ± SD	4.7 ± 2.5
Heartburn, n (%)	98 (85.2)
Acid regurgitation, n (%)	76 (66.1)
Reflux-related chest discomfort, n (%)	46 (40.0)
Sour taste in mouth, n (%)	41 (35.7)
Frequent spicy food intake, n (%)	61 (53.0)

BMI = Body Mass Index; GERD = Gastroesophageal Reflux Disease.

Most patients showed clinical improvement following treatment in the emergency department. Only a minority required hospital admission. Symptom recurrence was observed in 35 (30.4%) patients during the three-month follow-up period (Table 2).

Table 2: Clinical outcomes after emergency department treatment (n=115)

Outcome	Value
Symptom improvement at discharge, n (%)	100 (87.0)
No significant improvement at discharge, n (%)	15 (13.0)
Hospital admission required, n (%)	12 (10.4)
Discharged from emergency department, n (%)	103 (89.6)
Length of emergency department stay (hours), Mean ± SD	5.4 ± 2.1
Emergency department revisit within 30 days, n (%)	24 (20.9)
Symptom recurrence within 3 months, n (%)	35 (30.4)

Recurrence was defined as reappearance of GERD symptoms requiring medical consultation, medication use, or emergency department revisit during follow-up.

Patients who developed recurrence had significantly higher BMI, smoking frequency, diabetes mellitus, and previous history of GERD compared with those who remained symptom-free. No significant difference was observed regarding age, gender, or hypertension (Table 3).

Table 3: Comparison of characteristics between patients with and without recurrence

Variable	Recurrence (n=35)	No Recurrence (n=80)	Test Statistic	p-value
Age (years), Mean ± SD	46.2 ± 12.1	43.2 ± 13.0	t = 1.16	0.248
BMI (kg/m²), Mean ± SD	30.2 ± 4.0	27.0 ± 3.8	t = 4.01	<0.001
Male gender, n (%)	22 (62.9)	45 (56.3)	χ^2 = 0.44	0.505
Current smokers, n (%)	18 (51.4)	21 (26.3)	χ^2 = 6.76	0.009
Diabetes mellitus, n (%)	14 (40.0)	14 (17.5)	χ^2 = 6.93	0.008
Hypertension, n (%)	14 (40.0)	21 (26.3)	χ^2 = 2.15	0.143
Previous GERD history, n (%)	21 (60.0)	21 (26.3)	χ^2 = 11.80	0.001
Frequent spicy food intake, n (%)	24 (68.6)	37 (46.3)	χ^2 = 4.82	0.028
Symptom duration (days), Mean ± SD	5.5 ± 2.7	4.3 ± 2.3	t = 2.35	0.020

Independent sample t-test was used for continuous variables and Chi-square test for categorical variables.

Multivariable logistic regression analysis identified obesity, smoking, diabetes mellitus, and previous history of GERD as independent predictors of recurrence. Previous history of GERD showed the strongest association with recurrence (Table 4).

Table 4: Multivariable logistic regression analysis for predictors of symptom recurrence

Variable	Adjusted OR	95% CI	p-value
Age (per year increase)	1.01	0.97 – 1.05	0.621
Obesity (BMI ≥30 kg/m²)	2.54	1.09 – 5.91	0.031
Current smoking	2.29	1.01 – 5.18	0.047
Diabetes mellitus	2.31	1.01 – 5.31	0.046
Hypertension	1.28	0.54 – 3.02	0.573
Previous history of GERD	3.71	1.61 – 8.54	0.002
Frequent spicy food intake	1.88	0.86 – 4.12	0.114

OR = Odds Ratio; CI = Confidence Interval. Variables with $p<0.20$ in univariate analysis were entered into the multivariable logistic regression model.

Discussion

GERD is a common problem seen in emergency departments. Many patients come with severe heartburn, acid regurgitation, or chest discomfort [11]. Most of our patients improved after treatment and were discharged from the emergency department. However, symptom recurrence was seen in about one-third of patients during follow-up. A similar recurrence rate has been reported in previous studies [12]. This suggests that symptom control at the first visit does not always prevent future episodes.

Heartburn and acid regurgitation were the most frequent symptoms in our study. These findings are expected because both are typical features of GERD. Most patients responded well to initial treatment. This may be due to the use of acid-suppressing medicines and dietary advice given at discharge [13].

We found that obesity was significantly associated with symptom recurrence. Patients with recurrent symptoms had a higher BMI than those without recurrence [14]. Similar findings have been reported in previous studies. Excess body weight increases pressure inside the abdomen [15]. This may promote reflux and worsen symptoms. Weight control may therefore help reduce future attacks.

Smoking was also more common among patients with recurrence. Smoking can weaken the lower esophageal sphincter and increase acid exposure in the esophagus. This may explain the higher recurrence rate observed in smokers. Smoking cessation should be encouraged in these patients [15] [16] [17].

Diabetes mellitus showed a significant association with recurrence. Delayed gastric emptying is common in diabetic patients. This can increase reflux symptoms and reduce symptom control. Previous studies have reported similar observations. Good glycemic control may improve long-term outcomes in these patients [18].

A previous history of GERD was the strongest predictor of recurrence in our study. Patients who already had GERD were more likely to develop symptoms again. This finding is not surprising because GERD is usually a chronic condition with periods of improvement and relapse. Frequent spicy food intake was associated with recurrence on initial analysis [19]. However, this relationship was not significant after adjustment for other factors.

The findings of this study have practical importance. Patients with obesity, smoking history, diabetes, or previous GERD should receive closer follow-up after emergency treatment. These patients may benefit from stronger lifestyle counselling and regular outpatient review.

This study has some limitations. It was conducted at a single center and the follow-up period was relatively short. Symptom assessment was based on patient reporting. Future multicenter studies with longer follow-up may provide stronger evidence.

Conclusion

Most patients with acute GERD symptoms improved after emergency department treatment. Despite this, recurrence remained common. Obesity, smoking, diabetes mellitus, and previous GERD history were important predictors of recurrence. Early identification of these factors may help reduce future symptoms and repeat hospital visits.

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