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Incidence of Erosive Esophagitis in Patients of Gastroesophageal Reflux Disease

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ABSTRACT

Objectives: To determine the prevalence of erosive esophagitis among patients reported with gastroesophageal reflux disease at the outpatient department. **Study Design:** Prospective cross-sectional study. **Place & duration of study:** Department of Medicine, CMH, Multan from July 2024 to December 2024. **Methods:** A total of 120 patients aging ≥18 years presenting with the typical symptoms of gastroesophageal reflux (heartburn and/or acid regurgitation occurring at least twice weekly for ≥3 months) were included in this study. Upper gastrointestinal endoscopy was arranged for each patient and patients diagnosed with erosive esophagitis were graded as per the Los Angeles classification system. Descriptive statistics were used to summarize the demographic features, clinical features and the prevalence of erosive esophagitis among the study patients. **Results:** The mean age of participants was 42.05 ± 10.42 years (range: 26-62 years), with a slight male predominance (55.8% vs 44.2%). Endoscopic evaluation revealed the prevalence of erosive esophagitis as 21.7%, with the majority classified as Los Angeles grade A (10.8%), followed by grade B (5.8%), grade C (3.3%), and grade D (1.6%). The comparison of demographic characteristics revealed that the erosive esophagitis was significantly more prevalent in aging patients (p=0.001), male gender (p=0.045), higher BMI (p= <0.001), with smoking history (p=0.01) and patients reported with alcohol consumption (p=0.01). Similarly, patients having Hiatal hernia significantly suffered more from EE (p=0.04). The comparison between clinical symptoms among EE and Non-EE patients showed that symptoms like dysphagia (p=0.02) and night time reflux (p=0.04) were significantly higher in patients suffering EE compared to Non-EE patients. **Conclusion:** Nearly one-fifth of the patients reported with gastroesophageal reflux disease exhibit erosive esophagitis, with most cases classified as mild to moderate stage of the disease.

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a common clinical condition characterized by the reflux of gastric contents into the esophagus. The patients with GERD report with the commonly distressing complaints like heartburn, regurgitation, and chest pain which may further develop to potential issues including erosive esophagitis (EE), peptic strictures, Barrett's esophagus and even esophageal adenocarcinoma.[1] The global prevalence of GERD has steadily increased during past few decades, currently affecting approximately 10-20% of the adults in Western population, with severe disease observed in 6% of individuals. There are, however, significant geographical variations, and the data comprising of Asian population reports a prevalence of 5-10%.[2]

GERD manifests along a spectrum of severity, from non-erosive reflux disease (NERD) to EE. NERD accounts for about 60-70% of GERD cases, while EE is a more severe form, characterized by visible mucosal breaks in the esophagus which can be observed during endoscopy.[3] The risk factors associated with EE, include old age, male sex, obesity, smoking, alcohol consumption, and the presence of hiatal hernia. However, these factors are inconsistent across different populations and healthcare settings and this rising prevalence is attributed to multiple factors, including the global obesity epidemic, changes in dietary habits, and increased awareness among healthcare professionals and patients.[4]

In GERD, the esophagus is at risk of potential injury, as the lower esophageal sphincter fails to restrict the reflux of gastric acids. This chronic acid exposure can result in the inflammation of the esophageal lining causing the development of esophagitis. EE represents a more severe form of esophagitis where ulcerations and erosion occurs due to the damaged the esophageal mucosa.[5] The

pathophysiology of EE is however complex and explained by interactions between aggressive factors (including acid and pepsin exposure, bile reflux, and impaired mucosal defense mechanisms of the mucosal lining) and the protective factors (such as effective esophageal clearance, mucosal resistance, and saliva production). The transformation from NERD to EE is not fully understood, as some patients maintain stable phenotypes while others can progress to more severe forms. This multifactorial nature of the disease development highlights the importance of identifying the high risk patients for developing erosive changes.[6,7]

The accurate and timely identification of patients with EE has a significant clinical importance as patients with EE often require more aggressive acid suppression therapy and have different patterns of response to treatment. Closer surveillance may also save from progressing to complications such as strictures, Barrett's esophagus, and adenocarcinoma. The economic burden associated with EE management is thereby substantial, not only in shape of direct medical costs but also due to productivity losses, and reduced quality of life.[8,9]

Upper endoscopy by visualizing the mucosal injury is taken as the gold standard in the diagnosis of EE. The Los Angeles (LA) classification system by grading EE from A (mild) to D (severe) provides a standardized framework for assessing severity and guiding prognosis.[10] However, low-resource medical budgets create disparities in endoscopic access and expertise, and delay the diagnosis of EE. Moreover, over-the-counter use of PPIs has altered the natural history of GERD and potentially mask the endoscopic findings therefore complicate the estimates of actual prevalence of the disease.

Despite the clinical importance of EE, precise prevalence in GERD in our local patients is not well-documented across different regions and ethnic groups. Moreover, with availability of proton pump inhibitors (PPIs) and other acid-reducing therapies, the prevalence of EE is said to be reduced and new data is needed in this regard. This study was therefore aimed to determine the prevalence of EE among patients reported with GERD at the outpatient department of our hospital. We also worked on common factors associated with the development of EE. These results will be helpful in understanding the prevalence of EE and will help to design management strategies to prevent long-term complications associated with GERD.

METHODOLOGY

This cross-sectional study was conducted at the department of Medicine, CMH, Multan from July 2024 to December 2024, over a period of 6 months after getting approval of conducting the study from ethical review committee of the hospital.

The sample size was estimated as per following assumptions:

Precision=6.00%, Prevalence of EE patient of GERD =8.8%, Population size**:** Infinite. With a confidence interval of 95%, the estimated sample size (n) =86.[11]

A total of 120 patients aging ≥18 years presenting at the outpatient department of the hospital with the typical symptoms of GERD (heartburn and/or acid regurgitation occurring at least twice a week for ≥3 months) were included in this study through consecutive sampling.

Exclusion criteria was set as patients with previous gastrointestinal surgery, malignancy, severe comorbidities or recent use of acid-suppressing medications were excluded from the study. Those who had any contraindications to endoscopy were also excluded.

A written consent was taken from each patient prior to enrolment in the study.

Demographic details, lifestyle factors, detailed medical history and presence of comorbidities was recorded for all the study participants. Each patient was diagnosed through Upper Gastrointestinal Endoscopy by experienced gastroenterologists and patients diagnosed with EE were graded in accordance to the Los Angeles (LA) classification system.

The primary outcome of this research was to determine the prevalence of EE among patients reported with GERD at the outpatient department of our hospital. Additionally, the prevalence of EE was compared across different patient subgroups, such as age, gender, BMI, and other related features.

Statistical analysis was done using SPSS version 26. Descriptive statistics were shared to summarize the demographic characteristics, clinical features and the prevalence of EE among the GERD patients. Continuous variables were calculated as mean ± standard deviation (SD) while categorical variables were shared as frequency and percentage. Comparison of demographics, presence of co-morbidities and clinical symptoms was made between the patients diagnosed with EE and Non-EE to find the statistical significance of the qualitative and quantitative. Chi-square test was applied to compare categorical variables, while independent t-test was employed for continuous variables. A p-value of <0.05 was taken as statistically significant.

RESULTS

The mean age of patients was 42.05± 10.42 years (ranging from 26 to 62 years). The males comprised of 55.8% of the study population while female comprised of 44.2% population. Details of demographics, co-morbidities and medical history of study population are shared in Table 1.

Table 1

Demographics, co-morbidities and medical history (n =120)

Demographics, Life Style and Medical History		
Age (Mean±SD) years		42.05±10.42
Gender	Male n (%)	67 (55.8)
	Female n (%)	53 (44.2)
BMI (Mean±SD) Kg/m^2		28.07±4.06
Smoking status	Yes n (%)	57 (47.5)
	No n (%)	63 (52.5)
Alcohol consumption	Yes n (%)	11 (9.2)
	No n (%)	109 (90.8)
Presence of comorbidities	Hiatal hernia n (%)	28 (23.3)
	Diabetes mellitus n (%)	19 (15.8)
	Hypertension n (%)	17 (14.2)
	Anxiety/depression n (%)	23 (19.8)
Clinical symptoms of GERD	Heartburn n (%)	106 (88.33)
	Regurgitation n (%)	92 (76.66)
	Chest pain n (%)	74 (61.7)
	Dysphagia n (%)	25 (20.8)
	Nighttime reflux n (%)	44 (36.7)
Duration of symptoms (Mean±SD) months		21.63± 6.04

The endoscopic evaluation of these patients reported with GERD showed that EE was present in 21.7% of the patients, while 10.8% of the EE cases belonged to LA grade A as shown in Table 2.

Table 2

Prevalence of Erosive Esophagitis and Los Angles Grades. (n=120)

Prevalence of erosive esophagitis EE and LA grades		
Prevalence of erosive esophagitis n (%)		26 (21.7)
Los Angles grade	A n (%)	13 (10.8)
	B n (%)	7 (5.8)
	C n (%)	4 (3.3)
	D n (%)	2 (1.6)

The comparison of demographic characteristics revealed that the EE was significantly more prevalent in aging patients (p=0.001), male gender (p=0.045), higher BMI (p= <0.001), with smoking history (p=0.01) and patients reported with alcohol consumption (p=0.01). Similarly, patients having Hiatal hernia significantly suffered more from EE (p=0.04) as shown in Table 3.

Table 3

Association of Prevalence of EE with Different Demographics and Comorbidities (n=120)

Demographics & Clinical Characteristics	EE Patients (n = 26)	Non-EE Patients (n = 94)	Chi-square value/t-value	p-value
Demographics				
Age (Mean±SD) years	47.81±8.95	40.46±10.28	3.31	0.001
Male gender n (%)	19 (73.1)	48 (51.1)	4.00	0.045
BMI (Mean±SD) Kg/m^2	30.38±3.3	27.43±4.03	3.43	<0.001
Smoking history n (%)	18 (69.23)	39 (41.5)	6.29	0.01
Alcohol consumption n (%)	6 (23.1)	5 (5.32)	7.71	0.01
Co-morbidities				
Hiatal hernia n (%)	10 (38.5)	18 (19.1)	4.25	0.04
Diabetes mellitus n (%)	3 (11.5)	16 (17)	0.46	0.5
Hypertension n (%)	3 (11.5)	14 (14.9)	0.19	0.66
Anxiety/depression n (%)	5 (19.2)	18 (19.1)	0.00	0.99

The comparison between clinical symptoms among EE and Non-EE patients showed that symptoms like dysphagia and night time reflux were significantly higher in patients suffering EE compared to Non-EE patients as shown in Table 4.

Table 4

Comparison of Clinical Symptoms among EE and Non-EE Patients (n=120)

Clinical Symptoms	EE Patients (n = 26)	Non-EE Patients (n = 94)	Chi-square value/t-value	p-value
Heartburn n (%)	26 (100)	82 (87.23)	0.51	0.48
Regurgitation n (%)	15 (57.7)	76 (80.9)	3.65	0.06
Chest pain n (%)	12 (46.2)	34 (36.2)	0.86	0.35
Dysphagia n (%)	12 (42.3)	16 (16)	6.25	0.02
Nighttime reflux n (%)	14 (53.9)	30 (32)	4.2	0.04
Duration of GERD symptoms (Mean±SD) months	23±7.23	21.26±5.66	1.3	0.2

DISCUSSION

The endoscopic evaluation in our study revealed 21.7% prevalence of EE, with the majority classified as LA grade A (10.8%), followed by grade B (5.8%), grade C (3.3%), and grade D (1.6%). The comparison of demographic characteristics showed that EE was significantly more prevalent in aging patients (p=0.001), male gender (p=0.045), higher BMI (p= <0.001), with smoking history (p=0.01) and patients reported with alcohol consumption (p=0.01). Similarly, patients having Hiatal hernia significantly suffered more from EE (p=0.04). The comparison between clinical symptoms among EE and Non-EE patients showed that symptoms like dysphagia (p=0.02) and night time reflux (p=0.04) were significantly higher in patients suffering EE compared to Non-EE patients.

Limited work have been done in Pakistan regarding the prevalence of EE in Pakistani population, however, international studies have discussed its prevalence and the stages of EE using different diagnostic tools including endoscopy.

A multicenter study by SEO GS et al. found an 8.8% prevalence of EE in overall study patients, with LA grade A being most common. The incidence of EE was more common in older age patients and those having higher BMI (≥ 25 kg/m^2). The patients with co-morbidities like elevated triglycerides (≥ 150 mg/dL, OR: 1.65), high fasting glucose (≥ 126 mg/dL, OR: 1.73), and hiatal hernia (OR: 3.11) were at significantly increased risk of EE.[11] Mochizuki N et al. reported the prevalence of EE to be 16.7%, where most of reported cases were mild (LA grade A= 79.9%, LA grade B=18%). The data showed that a predominant proportion of these patients were males (22.2%) compared to females (7.3%). Age, higher BMI, smoking, alcohol and stress were also found significantly linked to EE.[12] Alsahafi M et al. worked on retrospective record to determine the prevalence and risk factors of EE and recorded a prevalence of EE to be 25.6%. The most common stage of EE was LA Grade A (53.9%), followed by grade B (29.6%). Hiatal hernia was a significant independent risk factor for the development of EE. Contrary to our findings and findings of other studies, age, gender, and BMI were not reported to be associated with the development of EE.[13] Bhatia SJ et al. investigated the topic in Indian population and reported the prevalence of EE to be 10% in overall GERD patients.[14]

Sugihartono T et al. shared a higher prevalence of EE (64.1%). The endoscopic evaluation found 24 cases classified as LA grade B or C. The study findings were different from the results of others studies and in line with the Alsahafi M et al., as demographic factors such as sex, age, ethnicity, and BMI were not associated with more severe forms of EE (LA grade B or C) and being overweight or obese did not correlated with clinically significant EE. Hiatal hernia was, however, reported to be independent risk factor as found in previous research works.[15] Similar high proportion of EE was mentioned in India by Verma S et al, where a high 67% patients were diagnosed with EE in 100 patients reporting with the symptoms of GERD in outpatient department. EE was correlated with low socio-economic status, alcohol use, and histological changes ($p<0.05$) in this study data.[17] The proportion of EE was also high in the study conducted by Meira ATDS et al., where the prevalence of EE diagnosed through upper endoscopy was 41.6%. The condition was more common in males and strongly associated with hiatal hernia, which increased the likelihood of esophageal erosions. This was

also shared that severe EE of grades C and D was significantly linked to older age, smoking, and hiatal hernia, indicating that these factors contribute to advanced stages of the disease.[17] A study conducted in Taiwan worked on 625 patients across different stages of erosive esophagitis (EE). An important finding of the study was that patients with LA grade A & B exhibited higher frequencies of symptoms such as epigastric pain, fullness, dysphagia, and throat clearing compared to those with LA grade C & D EE and Barrett's esophagus. This suggests that milder stages of EE are associated with more pronounced symptoms.[18]

As suggested by the results of our study and the studies discussed above, a notable proportion of GERD patients are diagnosed with EE, emphasizing its clinical significance. In order to take up some inconsistencies regarding prevalence, symptoms and risk factors, endoscopic evaluation is a valuable tool in the diagnostic process.

The limitations of this research include its small population size. Moreover, this was a single center research and only covered patients coming from a certain geographic location of South Punjab. Future studies with larger number of patients and employing multicenter approach will add up in this useful data regarding the prevalence of EE in patients presenting with GERD.

CONCLUSION

A notable proportion of individuals with GERD exhibit EE, with most cases classified as mild to moderate (Los Angeles grade A and B). The study showed that EE arises from a combination of factors, including age, male sex, elevated BMI, smoking, alcohol use, and hiatal hernia. These demographic, clinical, and anatomical contributors underscore the multifactorial etiology and the role of structural changes in disease susceptibility. The study also exhibited a higher frequency of dysphagia and nighttime reflux, emphasizing the impact of EE on symptom severity and quality of life. These findings underscore the importance of timely identification and targeted intervention for the high-risk patients to prevent complications related to EE.

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