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Prevalence of Eosinophilic Esophagits in Egyptian Gastroesophageal Reflux Disease Patients

Abdelnaser Abdelaty Gadallah

El-Sayed Ibrahim El Shayeb

Mohamed Magdy Elshwikh

Hayam Abdel Samie Aiad

Ezzat Mohamed Abdallah

ORIGINAL STUDY

Prevalence of Eosinophilic Esophagitis in Egyptian Gastroesophageal Reflux Disease Patients

Abdelnaser A. Gadallah [a], El-Sayed I. El Shayeb [a], Mohamed M. Elshwikh [a,*], Hayam A.S. Aiad [b], Ezzat M. Abdallah [a]

[a] Department of Internal Medicine Gastroenterology, Faculty of Medicine, Menoufia University, Shebin El Kom, Menoufia, Egypt
[b] Department of Pathology, Faculty of Medicine, Menoufia University, Shebin El Kom, Menoufia, Egypt

Abstract

Objectives: **To assess the prevalence of eosinophilic esophagitis (EoE) in Egyptian patients with recurrent gastroesophageal reflux disease (GERD) symptoms resistant to proton pump inhibitor therapy.**

Background: **EoE is an emerging condition that can mimic symptoms of GERD. Its prevalence in patients with refractory GERD symptoms in Egypt remains unclear.**

Patients and methods: **Our cross-sectional study included 150 patients with GERD symptoms unresponsive to conventional treatment. Patients underwent comprehensive clinical examinations, laboratory tests, and upper gastrointestinal endoscopy with esophageal mucosal biopsy. Demographic data, clinical symptoms, endoscopic findings, and histopathological results were analyzed.**

Results: **Of the 600 initial patients, 150 met the inclusion criteria. The mean age was 48.3 ± 10.7 years, with 47.3% males and 52.7% females. Heartburn was the most common symptom (66.7%). EoE was diagnosed in eight (1.3%) patients. Endoscopic findings associated with EoE included pseudotrachea (75%), mucosal edema (8.8%), esophageal stenosis (30%), feline esophagus (3.8%), crêpe paper esophagus (75%), and narrow caliber (8.8%). Histologically, an eosinophil count more than 15 per high-power field was observed in 75% of EoE cases. No significant associations were found between EoE and age, BMI, or sex.**

Conclusion: **The prevalence of EoE in Egyptian patients with refractory GERD symptoms was 1.3%. Specific endoscopic and histological findings were significantly associated with EoE. These results emphasize the importance of considering EoE in the differential diagnosis of patients with persistent GERD symptoms despite proton pump inhibitor therapy. Further research is needed to understand the long-term implications and optimal management strategies for EoE in this population.**

Keywords: Eosinophilic esophagitis, Gastroesophageal reflux disease, Proton pump inhibitor resistance, Pseudotrachea, Upper gastrointestinal endoscopy

1. Introduction

Eosinophilic esophagitis (EoE) has become increasingly important in diagnosing upper gastrointestinal symptoms. EoE is defined by the presence of an infiltrate with at least 15 eosinophils per high-power field in a biopsy of esophageal mucosa, accompanied by symptoms of esophageal dysfunction and the exclusion of other causes of eosinophilia [1]. Common symptoms associated with EoE include food impaction, dysphagia, and allergic disorders such as bronchial asthma [2]. The diagnosis is based on clinical presentations of esophageal dysfunction and pathological findings, excluding other causes of tissue eosinophilia [3]. Endoscopic findings in EoE patients often show mucosal edema, vertical furrows, concentric rings, whitish exudates, and esophageal strictures [4]. EoE is diagnosed when at least 15 eosinophils are present in a single high-power field without other causes of esophageal

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* Corresponding author at: Menoufia 32511, Egypt.
E-mail address: Mohamedelshwikh@yahoo.com (M.M. Elshwikh).

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eosinophilia [1]. Additionally, EoE can present with symptoms similar to gastroesophageal reflux disease (GERD), such as heartburn and regurgitation [2]. The increasing prevalence of EoE may be attributed to advancements in diagnostic research or changes in pathogenic mechanisms [5].

Our study aims to assess the prevalence of EoE in Egyptian patients suffering from recurrent GERD symptoms who do not respond adequately to proton pump inhibitor (PPI) therapy.

2. Patients and methods

This cross-sectional study was conducted at the Endoscopic Unit of the Internal Medicine Department at Menoufia University Hospital from January 2023 to June 2023. The study included 150 patients presenting with GERD symptoms such as regurgitation, dysphagia, heartburn (particularly after meals), nausea, dyspepsia, and dry cough, who were resistant to conventional treatment.

Initially, 600 patients agreed to participate in the study. However, 450 patients were excluded based on the exclusion criteria, resulting in a final sample size of 150 patients.

2.1. Inclusion criteria

Patients with GERD symptoms (dysphagia, heartburn after meals, nausea, dyspepsia, dry cough). No definite diagnosis of EoE. Not on steroid therapy. No history of anti-reflux surgery. Hemodynamically stable patients. Age between 18 and 70 years.

2.2. Exclusion criteria

Hemodynamic instability. Diagnosed esophageal cancer. Patients with irritable bowel disease. Drug-induced esophagitis (due to NSAIDs, aspirin, anticoagulants). Coagulation disorders (including mixed collagen vascular disease, thrombocytopenia, esophageal varices, or gastrointestinal motility disorders such as achalasia or gastroparesis).

2.3. Data collection and clinical examination

All patients underwent a comprehensive history and clinical examination, including a detailed symptom assessment specific to GERD. General examination assessing vital signs, consciousness level, and pallor. Central nervous system examination. Cardiovascular system examination.

The following investigations were performed for all patients: complete blood count, international normalized ratio, C-reactive protein, abdominal ultrasound, liver function tests, stool analysis, and upper gastrointestinal endoscopy (using Olympus GIF H170, Japan) with esophageal mucosal biopsy for histopathological examination to assess EoE.

The study protocol was approved by the Institutional Review Board (IRB) committee of Menoufia University Hospitals under code no.5/2022INTM14. Written informed consent was obtained from each patient before they participated in the study.

2.4. Statistical analysis

Data were collected, tabulated, and statistically analyzed using SPSS, version 22 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics were employed, with quantitative data presented as mean, SD, and range, and qualitative data presented as numbers and percentages. The odds ratio (OR) was calculated to quantify the strength of association between two events. The OR is defined as the ratio of the odds of an event occurring in the presence of a particular condition compared to the odds of it occurring in the absence of that condition.

3. Results

The study included 600 patients, with a sex distribution of 316 (47.3%) males and 284 (52.7%) females. The mean age was 48.3 ± 10.7 years, ranging from 18 to 71 years. The mean BMI was 26.9 ± 3.04, ranging from 21 to 40. Clinically, heartburn was reported by 400 (66.7%) patients, dyspepsia by 136 (22.7%) patients, dysphagia by 76 (12.7%) patients, epigastric pain by 100 (16.7%) patients, vomiting by 112 (18.7%) patients, and weight loss by 36 (6%) patients. The mean duration of symptoms was 14.2 ± 11 months (Table 1).

EoE was observed in eight (1.3%) patients, while dysplasia was found in 44 (7.3%) patients, metaplasia in 32 (5.3%) patients, and malignancy in eight (1.3%) patients. Endoscopic findings revealed pseudotrachea in four (0.67%) patients, mucosal edema in 68 (11.3%) patients, and esophageal stenosis in 20 (3.3%) patients. Minor criteria findings included feline esophagus in 72 (12%) patients, crêpe paper esophagus in eight (1.3%) patients, and narrow caliber in 68 (11.3%) patients (Table 2).

Patients with EoE had a mean age of 52 ± 12 years compared to 48 ± 11 years in those without the condition, with a P value of 0.231. The mean BMI was 27 in both groups. Among males, 99.7% did not have EoE, and 0.3% did, whereas among females, 98.1% did not have the condition, and 1.9% did, with a P value of 0.625 (Table 3).

Table 1. Demographic and clinical data among patients group.

Demographic data	*n* (%)
Sex	
Male	316 (47.3)
Female	284 (52.7)
Age	
Mean ± SD	48.3 ± 10.7
Range	18–71
BMI	
Mean ± SD	26.9 ± 3.04
Range	21–40
Clinical data	
Heartburn	400 (66.7)
Dyspepsia	136 (22.7)
Dysphagia	76 (12.7)
Epigastric pain	100 (16.7)
Vomiting	112 (18.7)
Weight loss	36 (6)
Mean duration of symptoms (months) (mean ± SD)	14.2 ± 11

Table 2. Pathological and endoscopic findings among patients group.

Pathological findings	Yes [*n* (%)]	No [*n* (%)]
Eosinophilic esophagitis	8 (1.3)	592 (98.7)
Dysplasia	44 (7.3)	556 (92.7)
Metaplasia	32 (5.3)	568 (94.7)
Malignancy	8 (1.3)	592 (98.7)
Endoscopic findings	*n* (%)	
Major criteria		
Pseudotrachea	4 (0.67)	
Mucosal edema	68 (11.3)	
Esophageal stenosis	20 (3.3)	
Minor criteria		
Feline esophagus	72 (12)	
Crêpe paper esophagus	8 (1.3)	
Narrow caliber	68 (11.3)	
Endoscopic finding	Mean ± SD	
Mucosal edema ($N = 4$)	160 ± 139.8	
Feline esophagus ($N = 8$)	166.25 ± 125.6	
Narrow caliber ($N = 7$)	111.4 ± 56.7	

Table 3. Association between eosinophilic esophagitis and demographic characteristics.

Demographic characteristics	Eosinophilic esophagitis				*P* value
	Yes		No		
	Mean	SD	Mean	SD	
Age	52	12	48	11	0.231
BMI	27	2	27	3	
Sex					
Male	287	99.7	1	0.3	0.625
Female	306	98.1	6	1.9	

Eosinophilic count more than 15 was noted in three (75%) patients with EoE and one (25%) patient without, with a significant *P* value of less than 0.001. Dysplasia and metaplasia were not significantly associated with EoE ($P = 0.651$ and 0.362, respectively). Endoscopic findings of EoE included pseudotrachea in 75% of cases, mucosal edema in 8.8%, esophageal stenosis in 30%, feline esophagus in 3.8%, crêpe paper esophagus in 75%, and narrow caliber in 8.8%, all with significant *P* values of less than 0.001 (Table 4).

4. Discussion

EoE is an increasingly recognized condition in patients with upper gastrointestinal symptoms [6]. Our study aims to assess the prevalence of EoE in Egyptian patients suffering from recurrent GERD symptoms that are resistant to PPI therapy.

In our study, which included 600 patients with symptoms of GERD, 150 were ultimately selected based on the inclusion and exclusion criteria. The demographic data showed a nearly equal sex distribution, with 47.3% males and 52.7% females and a mean age of 48.3 years. Clinically, the most common symptom was heartburn, reported by 66.7% of

Table 4. Association between histological and endoscopic findings and eosinophilic esophagitis.

Histological findings	Eosinophilic esophagitis [*n* (%)]		*P* value
	Yes	No	
Eosinophilic count			
>15	3 (75.0)	1 (25.0)	<0.001
17	3 (75.0)	1 (25.0)	
No	1 (0.2)	591 (99.8)	
Dysplasia			
Focal moderate	0	4 (100.0)	0.651
Low grade	0	36 (100.0)	
Mild squamous	0	4 (100.0)	
No	7 (1.3)	549 (98.7)	
Metaplasia			
Glandular	0	32 (100.0)	0.362
No	7 (1.2)	561 (98.8)	
Malignancy			
Positive	0	8 (100.0)	0.699
No	7 (1.2)	585 (98.8)	
Endoscopic findings			
Pseudotrachea			
Yes	3 (75.0)	1 (25.0)	<0.001
No	4 (0.7)	592 (99.3)	
Mucosal edema			
Yes	6 (8.8)	62 (91.2)	<0.001
No	1 (0.2)	531 (99.8)	
Esophageal stenosis			
Yes	6 (30.0)	14 (70.0)	<0.001
No	1 (0.2)	579 (99.8)	
Feline esophagus			
Yes	3 (3.8)	77 (96.3)	<0.001
No	4 (0.8)	516 (99.2)	
Crêpe paper esophagus			
Yes	6 (75.0)	2 (25.0)	<0.001
No	1 (0.2)	591 (99.8)	
Narrow caliber			
Yes	6 (8.8)	62 (91.2)	<0.001
No	1 (0.2)	531 (99.8)	

patients, followed by dyspepsia (22.7%), vomiting (18.7%), epigastric pain (16.7%), dysphagia (12.7%), and weight loss (6%). The mean duration of symptoms was 14.2 months. Pathological findings indicated that EoE was present in 1.3% of patients, while dysplasia and metaplasia were found in 7.3 and 5.3% of patients, respectively. Endoscopic findings showed mucosal edema in 11.3%, esophageal stenosis in 3.3%, and minor criteria such as feline esophagus in 12%.

Pathological findings revealed that 1.3% of patients had EoE, a figure consistent with the lower end of the prevalence spectrum reported in previous studies [7]. Dysplasia and metaplasia were observed in 7.3 and 5.3% of patients, respectively. This is in line with research by Dănilă *et al.* [8], who reported similar rates of these conditions in GERD patients. However, the malignancy rate of 1.3% is notably low compared to some studies suggesting higher malignancy risks in chronic GERD patients [9].

Our study showed no significant association between EoE and factors such as age, BMI, and sex, which is consistent with some studies [10] but contrasts with others that suggest a higher prevalence of EoE in younger male patients [11]. Our study's mean age of 48.3 years for EoE patients and a nearly equal sex distribution supports the notion that EoE can affect a broad age range and both sexes.

Endoscopic findings indicated significant associations between EoE and features such as mucosal edema (8.8%), esophageal stenosis (30%), and feline esophagus (3.8%). These findings are corroborated by Abe *et al.* [12], who also reported similar endoscopic characteristics in EoE patients. Notably, the high prevalence of esophageal stenosis (30%) among EoE patients in our study is higher than some reports, which may be due to variations in the severity and duration of symptoms among different populations.

Our study underscores the importance of considering EoE in patients with GERD symptoms unresponsive to PPI therapy. The findings highlight significant pathological and endoscopic markers that can aid in the differentiation of EoE from other esophageal conditions. Further research is needed to explore the underlying mechanisms and potential genetic factors contributing to the variations in EoE prevalence and presentation across different populations.

Our study has several strengths, including a well-defined patient cohort and a comprehensive approach to data collection, encompassing detailed clinical, pathological, and endoscopic evaluations. The large initial sample size and the stringent inclusion and exclusion criteria ensured a focused analysis of patients with refractory GERD symptoms, which enhanced the validity of the findings. Moreover, the use of advanced endoscopic techniques and histopathological examinations provided robust data for assessing the prevalence and characteristics of EoE.

However, the study also has limitations. The cross-sectional design limits the ability to establish causal relationships between observed associations and outcomes. The study's setting at a single university hospital may limit the generalizability of the findings to broader populations. Additionally, the exclusion of patients with certain comorbidities and conditions might have introduced selection bias, potentially impacting the prevalence rates of EoE and other pathological findings. Future studies with longitudinal designs and multicenter collaborations are needed to validate and expand upon these findings, providing a more comprehensive understanding of EoE in diverse patient populations.

4.1. Conclusion

This study highlights the prevalence and characteristics of EoE in patients with refractory GERD symptoms. Significant endoscopic markers such as mucosal edema and esophageal stenosis are associated with EoE. These findings emphasize the need for thorough diagnostic evaluations in this patient population to ensure appropriate management and treatment. Further research is essential to understand the broader implications and improve patient outcomes.

Ethics information

The study protocol was approved by the Institutional Review Board (IRB) committee of Menoufia University Hospitals under code no.5/2022INTM14. Written informed consent was obtained from each patient prior to their participation in the study.

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Conflicts of interest

There are no conflicts of interest.

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