Original Article

Management of eosinophilic esophagitis is often discordant with guidelines and not patient-centered: results of a survey of gastroenterologists

Joy W. Chang ¹, Sameer D. Saini,^{2,1} Jessica L. Mellinger ¹, Joan W. Chen,¹
Brian J. Zikmund-Fisher ^{3,4}, Joel H. Rubenstein^{2,1}

¹Division of Gastroenterology, and ⁴Division of General Medicine, Department of Internal Medicine, and
³Department of Health Behavior and Health Education, University of Michigan, and ²Veterans Affairs Center for
Clinical Management Research, Ann Arbor VA Medical Center, Ann Arbor, Michigan, USA

SUMMARY. Published guidelines for the management of eosinophilic esophagitis (EoE) recommend an initial trial of proton pump inhibitors (PPI), histologic assessment for response to therapy, and tailoring treatments to patient needs and provider resources. Effectiveness studies directly comparing therapies are lacking, leaving a situation ripe for shared decision making. We aimed to assess gastroenterologists' adherence to guidelines and how they respond to EoE patients' preferences regarding management. We administered a web-based survey to practicing US gastroenterologists, assessing knowledge, and practice patterns in the management of EoE, including comfort with alternative treatments to steroids. Ninety-two providers responded, including 55% in private practice. Nearly half (47%) reported spending ≤ 10 minutes on initial education and counseling and 48% recommended PPI monotherapy prior to other strategies. Of those who did not start with PPI monotherapy, 55% chose topical steroids $\pm$ PPI and 26% dietary elimination $\pm$ PPI. Despite this, 90% felt comfortable allowing a patient to start dietary elimination instead of steroids, but less comfortable with dilation alone (39%) or no treatment (30%). Upon symptomatic resolution, 72% of academic providers recommended endoscopy with biopsies to demonstrate histologic response to treatment, compared to 27% in private practice. There are substantial variations in adherence to guidelines regarding PPI use and assessing response to therapy. Gastroenterologists prefer topical steroids over other treatment modalities and most spend little time educating and counseling, which may limit informed decision making. Strategies aimed at decreasing these variations in management and promoting shared decision making in EoE are needed.

KEY WORDS: decisions, disease management, guidelines, practice patterns, preference, providers.

INTRODUCTION

Eosinophilic esophagitis (EoE) is a chronic, immune, and allergy-mediated disorder that typically presents

with dysphagia and food impaction in adults. EoE is diagnosed in up to 23% of patients undergoing endoscopy for dysphagia and the incidence is rising with increasing awareness and diagnosis.^{1,2} As a recently recognized disease, the diagnosis and management of EoE are heterogeneous across providers despite existing clinical guidelines.

EoE is diagnosed based on symptoms of esophageal dysfunction and esophageal mucosal biopsies with ≥ 15 eosinophils per high power field (eos/HPF). Until recently, consensus guidelines recommended that the first step in management should be a trial of proton pump inhibitor (PPI) use. Updated guidelines now also recommend PPI use as initial therapy.^{3–5} If there is no histologic response to PPI, topical steroids and dietary elimination therapy are effective and recommended treatment modalities.^{6–11} Treatment endpoints include improvement of symptoms and

Address correspondence to: Joy W. Chang, MD, Division of Gastroenterology, Department of Internal Medicine, 3912 Taubman Center, 1500 E. Medical Center Drive, SPC 5362, Ann Arbor, MI 48109, USA. Email: chjoy@med.umich.edu
Specific author contributions: Joy Chang and Joel Rubenstein were involved in study concept and design. Sameer Saini, Jessica Mellinger, Joan Chen, and Brian Zikmund-Fisher consulted in development of the survey instrument. Joy Chang performed the acquisition of data. Statistical analysis was performed by Joy Chang. Data analysis and interpretation were performed by Joy Chang. Drafting of the manuscript was performed by Joy Chang. Critical revision of the manuscript was performed by all co-authors. Study supervision was provided by Joel Rubenstein. All authors approved the final version of the manuscript. Guarantor of the article: Joy W. Chang.
Financial support: Joy Chang is supported by a research training award (T32DK062708) from the NIH.
Potential competing interests: None.

histology, but symptoms alone are unreliable to determine disease activity and response to therapy.^{12,13} Despite these recommendations, PPI is not always used as initial therapy and symptoms often drive disease management without objectively assessing histologic response. In addition, because comparative effectiveness trials for topical corticosteroids, diet therapy, and dilation are lacking to date, the optimal choice for therapy after PPI is uncertain. In such contexts, the choice of therapy should be made based on patient preference and provider experience. To date, few studies describing practice patterns in EoE have been performed and show large variability in both diagnosis and management, but to our knowledge, none have assessed whether and to what extent decisions are made in a patient-centered manner.

We aimed to identify any heterogeneity in practice and adherence to guidelines, as well as to elicit provider comfort with patient decision making in EoE. We hypothesized that variations in practice patterns surrounding the management of EoE still exist, specifically with PPI use as initial treatment and monitoring response to therapy. Furthermore, we hypothesized that providers more commonly use topical steroids and may feel less comfortable with patients electing diet therapy or dilation alone to manage EoE.

METHODS

Participants

Survey participants included practicing US adult and pediatric gastroenterologists identified using a third-party healthcare database inclusive of both private practice and academic providers. As of October 2017, this included a total of 9687 identified email addresses.

Instrument

The survey instrument consisted of 25 questions about published guidelines pertaining to diagnosis and management of EoE, scenario-based clinical judgment, practice and patient population including referral habits, support from a licensed dietitian, and demographic information (see Supplementary Appendix S1). One question assessing provider comfort with non-steroid alternate treatment plans was randomized by respondent to include use of elimination diet, periodic endoscopic dilation, or no therapy. We pilot tested survey questions with the University of Michigan Center for Bioethics and Social Sciences in Medicine Working Group, a multidisciplinary group of survey experts. The survey was revised based on this feedback and further pretested with three gastroenterologists.

Survey administration

We delivered a link to the web-based survey administered online using Qualtrics (Qualtrics, Provo, UT) via an email distributed to the above list. Participation was voluntary and respondents were eligible to enter to win one of five \$100 gift cards after completing the survey. We sent a single reminder email to providers one week after the first email.

Analysis

We measured associations using Chi-squared and student's t-test analysis. We conducted all data management and analysis using Stata 14 (StataCorp, College Station, TX) and considered P-value less than 0.05 as significant. The Institutional Review Board for the University of Michigan School of Medicine (IRBMED) deemed this research as exempt from review.

RESULTS

Of the 9687 email addresses initially sent, recipients opened 707, and 92 physicians responded to the survey (13%). All 25 questions were completed by 82 physicians (89% completion rate). Survey respondents were mostly male (78%), 55% in private practice and 50% located in urban settings (vs. suburban or rural settings). Gastroenterologists who identified their practice in an academic center made up 39% of the respondents. A large majority (87%) of providers reported caring for only adult EoE patients, 5% for only pediatric patients, and 8% for a mixture of both adult and children with EoE. Participants varied in their years of clinical experience including 2% within fellowship training, 15% within the first 5 years of practice, 13% completed training 6–14 years prior, 31% completed training 15–24 years prior, and 39% having completed training 25 or more years prior.

The volume of EoE patients managed annually by survey respondents varied from 1 to 5 patients in 29% of respondents, 6 to 19 patients in 42%, 20 to 50 patients in 27%. Only 1 respondent reported managing greater than 50 patients with EoE annually. A majority of providers (65%) reported having readily available support with a licensed dietitian when recommending elimination diet therapy. During an initial visit for suspected or diagnosed EoE, 70% of providers reported that they always (100% of all initial visits) provide counseling on treatment options, expected disease course including symptom outcomes and need for future endoscopies. While 9% of respondents reported spending at least 20 minutes providing education and counseling, 47% spent no more than 10 minutes. Referral to an allergist was widely variable with 26% of respondents referring all EoE patients,

Fig. 1 Knowledge about diagnostic criteria for EoE.

23% referring only patients undergoing food elimination, 27% referring only if history of an allergic condition, and 24% never referring EoE patients for allergy evaluation.

Knowledge of clinical guidelines for EoE

In reference to making the diagnosis of EoE, nearly all (97%) respondents felt that eosinophil-predominant inflammation on esophageal biopsy was necessary for diagnosis. In addition, 58% reported that clinical symptoms of esophageal dysfunction were necessary and 36% reported that symptoms were helpful, but not necessary for diagnosis (Fig. 1). Of 63% of respondents felt exclusion of a secondary cause of esophageal eosinophilia was necessary. A majority felt that other diagnostic exams such as barium esophagram (99%), pH testing to rule out gastroesophageal reflux (94%), peripheral eosinophilia (100%), and allergy testing (96%) were not necessary for diagnosis or were helpful but not necessary. There was consensus that symptoms recur following discontinuation of medical or dietary therapy in 93% of providers. However, only 66% of respondents agreed that a maintenance strategy of topical steroids or elimination diet should be offered to all patients with EoE. Only 67% of respondents felt that esophageal dilation was a safe and effective method to manage symptoms.

Recommended initial therapy

In response to a clinical scenario describing a young male patient presenting with recurrent food impactions, endoscopic findings suggesting EoE with narrow caliber lumen, and eosinophil-rich esophagitis, only 48% of respondents recommended using PPI alone as initial therapy. Of those who did not start with PPI monotherapy, 26 (55%) chose topical steroids $\pm$ PPI, 12 (26%) dietary elimination $\pm$ PPI, and 9 (19%) endoscopic dilation alone as initial therapy. No respondents recommended monitoring symptoms without any of the above therapies. Responses were not significantly associated with practice setting, years since training, and volume of EoE patients.

Monitoring responses to therapy

Upon symptomatic resolution with swallowed topical steroids, a minority (45%) of providers reported that they would repeat endoscopy with biopsies to determine histologic improvement, 47% would not repeat endoscopy due to symptom resolution, and a minority (7%) felt that neither further endoscopies nor medical therapy was necessary after inducing clinical remission. Stratifying providers by their practice setting revealed that 72% of academic providers elected to pursue repeat endoscopy with biopsies to demonstrate histologic response, compared to 27% in

Table 1 Monitoring response to therapy after symptomatic resolution

	All respondents (n = 82)	Academic (n = 32)	Private (n = 45)
Repeat upper endoscopy with biopsies to determine histologic improvement	38 (46.3%)	23 (71.9%)*	12 (26.7%)*
Repeat upper endoscopy to determine endoscopic improvement	1 (1.2%)	0 (0%)*	1 (2.2%)*
No repeat upper endoscopy is necessary because symptoms have resolved	38 (46.3%)	9 (28.1%)*	28 (62.2%)*
No further endoscopic or medical therapy is necessary. EoE is now in remission after 1 course of therapy.	5 (6.1%)	0 (0%)*	4 (8.9%)*

Chi-square was used to assess differences between groups.

* $P < 0.05$ between academic and private gastroenterologists.

private practice (Table 1, $P < 0.05$). Years of gastroenterology training and volume of EoE patients seen were not significantly associated with recommended next steps after symptomatic resolution is attained.

In the setting of worsening symptoms despite adherence to fluticasone therapy, only 60% of providers recommended upper endoscopy with biopsies, while 18% recommended upper endoscopy with dilation alone, 10% addition of elimination diet to current topical steroid therapy, and 9% switching from fluticasone to budesonide. Few providers recommended transitioning from steroids to diet therapy (2%) or empirically increasing the dose of topical steroids (1%). Responses were not significantly associated with practice setting, years since training, and volume of EoE patients.

Patient-centered decision making

Respondents were randomized to scenarios of EoE patients voicing a preference for either an elimination diet, periodic endoscopic dilation alone, or no therapy with monitoring of symptoms as alternative management strategies to topical steroids. Among survey respondents randomized to a scenario of a patient preferring elimination diet over topical steroids, 90% reported feeling comfortable with this patient decision (Fig. 2). Regardless of having clinical support with a licensed dietitian, 37% felt very comfortable and 53% somewhat comfortable with a patient electing to start an elimination diet over topical steroids as initial therapy. Among those randomized to a scenario of a patient preferring periodic endoscopic dilation alone instead of topical steroids, 39% felt comfortable with allowing the patient to make this decision. Thirty percent of respondents felt comfortable with a patient's preference to elect monitoring of symptoms without any therapies. Provider comfort level to each patient decision over topical steroids was significantly different ($P < 0.05$).

DISCUSSION

In this survey of gastroenterologists on the management of EoE, we found that first, despite existing clinical guidelines, a majority of gastroenterologists do not recommend PPI as initial therapy in response to a standardized clinical scenario. Before the 2011 update of EoE clinical guidelines, Peery *et al.* reported that only 31% of respondent gastroenterologists required a PPI trial prior to making a diagnosis of EoE.¹⁴ In a more recent retrospective cohort study of patients diagnosed with EoE in the community, Lipka *et al.* demonstrated that only 6.5% were given a PPI trial before treatment.¹⁵ Over the last decade, consensus recommendations on the role of PPI have evolved from a means of ruling out inflammation due to gastroesophageal reflux disease, to a diagnostic tool to exclude PPI-responsive esophageal eosinophilia, to now a safe and effective first-line therapy in all EoE patients.^{3-5,16,17} These changing guidelines have likely caused considerable confusion among providers, particularly gastroenterologists who care for a small volume of EoE patients, and may be responsible for the variations in PPI use as first-line therapy. Among non-PPI treatments, the majority of gastroenterologists in our survey still choose topical steroids for initial therapy, consistent with practice trends in prior provider surveys.^{18,19}

Second, the findings of our provider survey have implications for both clinicians and patients by identifying potential gaps in a shared decision making process. Overall, providers feel comfortable with patients choosing elimination diet regardless of clinical support from a dietitian and at times, dilation alone or without therapies to target eosinophilic inflammation. Providing education and counseling to allow patients to make informed decisions requires time and effort on the part of the provider in our experience. We show here that nearly half of responding gastroenterologists report spending 10 minutes or less doing so on an initial visit, which may not be adequate to explore patient values and preferences for different treatment modalities. This exposes a possible discordance between

Fig. 2 Comfort with patient's decision to use therapy X (elimination diet, dilation, or no therapy) rather than topical steroids.

provider preferences and patient-values concordant treatment plans.

Our study is also unique in describing practice patterns of monitoring response to treatment. In contrast to guideline recommendations, the majority of respondent gastroenterologists do not repeat endoscopy with biopsies to determine successful response to therapy, suggesting that symptoms frequently drive disease management in practice. This difference in adherence to guidelines was significant by practice setting, with more academic gastroenterologists requiring histology over those in private practice. Similarly, practice patterns described by King *et al.* reported that 71% of surveyed pediatric and 91% of adult gastroenterologists rely on symptom-based follow-up of EoE.¹⁸

Limitations of this study include the low response rate, which is similar to prior EoE-focused provider surveys and may affect generalizability of the results. In addition, the study was limited to American gastroenterologists and may not reflect practice in other countries. In using clinical scenarios, we aimed to mimic actual practice, but did not observe practice directly. Although we demonstrated practice pattern variations in both the diagnosis and management of EoE, our survey does not explore the rationale for these provider practices and we attempted to gain insight by assessing knowledge of the guidelines and available clinical resources. In doing so, we also

revealed misconceptions about the diagnostic criteria for EoE including requiring clinical symptoms of esophageal dysfunction and exclusion of secondary causes of eosinophilia.

In summary, we found substantial variations in counseling patients with EoE and discordance with guidelines, particularly regarding the use of PPI as initial management and repeat endoscopy with histology to monitor response to therapy. Our findings highlight areas of need for education to providers on the clinical practice guidelines and strategies to explore physician-patient shared decision making in EoE care. To complement the focus on practice patterns and provider preferences, future work to evaluate the EoE patient experience is needed.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's website:

SUPPLEMENTARY APPENDIX. S1. Eosinophilic esophagitis provider practice survey

References

- 1 Veerappan G R, Perry J L, Duncan T J *et al.* Prevalence of eosinophilic esophagitis in an adult population undergoing

- upper endoscopy: a prospective study. *Clin Gastroenterol Hepatol* 2009; 7: 420–426.
- 2 Ricker J, McNear S, Cassidy T *et al*. Routine screening for eosinophilic esophagitis in patients presenting with dysphagia. *Therap Adv Gastroenterol* 2011; 4: 27–35.
 - 3 Dellon E S, Liacouras C A, Molina-Infante J *et al*. Updated international consensus diagnostic criteria for eosinophilic esophagitis: proceedings of the AGREE conference. *Gastroenterology* 2018; 155: 1022–33.
 - 4 Lucendo A J, Molina-Infante J, Arias A *et al*. Guidelines on eosinophilic esophagitis: evidence-based statements and recommendations for diagnosis and management in children and adults. *United Eur Gastroenterol J* 2017; 5: 335–58.
 - 5 Dellon E S, Gonsalves N, Hirano I *et al*. ACG clinical guideline: evidenced based approach to the diagnosis and management of esophageal eosinophilia and eosinophilic esophagitis (EoE). *Am J Gastroenterol* 2013; 108: 679–92.
 - 6 Dellon E S, Katzka D A, Collins M H *et al*. Budesonide oral suspension improves symptomatic, endoscopic, and histologic parameters compared with placebo in patients with eosinophilic esophagitis. *Gastroenterology* 2017; 152: 776–786.
 - 7 Gonsalves N, Yang G Y, Doerfler B *et al*. Elimination diet effectively treats eosinophilic esophagitis in adults; food reintroduction identifies causative factors. *Gastroenterology* 2012; 142: 1451–59.
 - 8 Kagalwalla A F, Sentongo T A, Ritz S *et al*. Effect of six-food elimination diet on clinical and histologic outcomes in eosinophilic esophagitis. *Clin Gastroenterol Hepatol* 2006; 4: 1097–102.
 - 9 Lucendo A J, Arias A, Gonzalez-Cervera J *et al*. Empiric 6-food elimination diet induced and maintained prolonged remission in patients with adult eosinophilic esophagitis: a prospective study on the food cause of the disease. *J Allergy Clin Immunol* 2013; 131: 797–804.
 - 10 Molina-Infante J, Arias A, Barrio J *et al*. Four-food group elimination diet for adult eosinophilic esophagitis: a prospective multicenter study. *J Allergy Clin Immunol* 2014; 134: 1093–1099.
 - 11 Straumann A, Conus S, Degen L *et al*. Budesonide is effective in adolescent and adult patients with active eosinophilic esophagitis. *Gastroenterology* 2010; 139: 1526–1537.
 - 12 Chang J W, Yeow R Y, Waljee A K *et al*. Systematic review and meta-regressions: management of eosinophilic esophagitis requires histologic assessment. *Dis Esophagus* 2018; 31. doi: 10.1093/dote/doy049.
 - 13 Dellon E S, Woodward K, Speck O *et al*. Symptoms do not correlate with histologic response in eosinophilic esophagitis. *Gastroenterology* 2012; 142: S432.
 - 14 Peery A F, Shaheen N J, Dellon E S. Practice patterns for the evaluation and treatment of eosinophilic oesophagitis. *Aliment Pharmacol Ther* 2010; 32: 1373–82.
 - 15 Lipka S, Kumar A, Richter J E. PPI trial for eosinophilic esophagitis: chaos in the community. *J Clin Gastroenterol* 2018; 52: 590–95.
 - 16 Furuta G T, Liacouras C A, Collins M H *et al*. Eosinophilic esophagitis in children and adults: a systematic review and consensus recommendations for diagnosis and treatment. *Gastroenterology* 2007; 133: 1342–63.
 - 17 Liacouras C A, Furuta G T, Hirano I *et al*. Eosinophilic esophagitis: updated consensus recommendations for children and adults. *J Allergy Clin Immunol* 2011; 128: 3–20.
 - 18 King J, Khan S. Eosinophilic esophagitis: perspectives of adult and pediatric gastroenterologists. *Dig Dis Sci* 2010; 55: 973–82.
 - 19 Spergel J M, Book W M, Mays E *et al*. Variation in prevalence, diagnostic criteria, and initial management options for eosinophilic gastrointestinal diseases in the United States. *J Pediatr Gastroenterol Nutr* 2011; 52: 300–6.