Eosinophilic Esophagitis and Esophageal Eosinophilia

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Overview

- Diagnostic Criteria
- Clinical Features of EoE
- PPI-Responsive Esophageal Eosinophilia
- Treatments
  - Drugs, Diet & Dilation
- Role of Maintenance therapy
- Management Algorithm
Prevalence of Eosinophilic Esophagitis in Children and Adults

- Olten County, Switzerland (Adults)
- Hamilton County, Ohio (<20yo)

Prevalence EoE:
- 4.5/10,000 Olten County, Switzerland (Adult)
- 10.4/10,000 Hamilton County, Ohio (Peds)

Noel, Rothenberg N Engl J Med 351;9 2005, 940-1
Diagnostic Criteria

- EoE is a clinico-pathologic disease
  - Symptoms related to esophageal dysfunction
  - Pathologically, 1 or more biopsy specimens must show eosinophil-predominant inflammation
  - 15 eosinophils/hpf (peak value) is considered a minimum threshold for a diagnosis of EoE.
  - Isolated to the esophagus
  - Ruling out other causes for eosinophilia
  - Multiple biopsies need to be obtained and evaluated for all pathologic features of EoE
  - Response to treatment is supportive of the diagnosis


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Clinical Presentation in Adults

- Male Predominant 3:1
- Presents in 3rd/4th decade
- Atopic History (70-80%)
- Caucasian predilection
- Family History of EoE or atopy

- Dysphagia **
- Food impaction (33-54%)
- Heartburn/reflux
- Chest pain

Findings on Endoscopy

- Rings
- Furrows
- Exudates
- Food Impaction

Furuta G, Liacouras C, Hirano I et al. JACI. 2011
How do we diagnosis EoE?

- Gold standard is esophageal biopsy

Histologic Features of EoE

- Superficial layering
- Eosinophilic microabscess
- Spongiosis
- Epithelial hyperplasia
- Degranulation
- Lamina propria fibrosis
Histologic Features of EoE

- Superficial layering
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- Spongiosis
- Epithelial hyperplasia
- Degranulation
- Lamina propria fibrosis

How many biopsies do you need?

![Bar chart showing the percentage of positive diagnoses with different numbers of biopsies. The x-axis represents the number of biopsies (Bx 1 to Bx 5), and the y-axis represents the percentage of positive diagnoses. The chart indicates that Bx 5 has a significantly higher percentage of positive diagnoses compared to 1-4.](image)
How many biopsies do you need?

Take 2-4 biopsies in both the proximal and distal esophagus to help maximize sensitivity

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≥15 eos/hpf
Diagnostic Threshold

Biopsies should be obtained from antrum and duodenum of all children and adults with gastric symptoms or endoscopic abnormalities

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Esophageal Eosinophilia Responding to PPI

• Classic sx of reflux
• Erosive esophagitis or Barrett’s on endoscopy
• Eosinophilia on bx resolves with PPI

• Likely GERD

• Symptoms and endoscopic features suggestive of EoE
• Symptoms and pathology resolve with PPI

• Likely PPI-REE
Eosinophils and PPI-REE

<table>
<thead>
<tr>
<th>Patient 1</th>
<th>Patient 2</th>
<th>Patient 3</th>
</tr>
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<tbody>
<tr>
<td>Age (yr)/sex</td>
<td>14/M</td>
<td>25/M</td>
</tr>
<tr>
<td>Presentation</td>
<td>Pain</td>
<td>Food impaction</td>
</tr>
<tr>
<td>Environmental Allergies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Treatment</td>
<td>Omeprazole 10 mg BID</td>
<td>Omeprazole 20 mg BID</td>
</tr>
<tr>
<td>Eosinophils/npr</td>
<td>Before treatment: 37</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>After treatment: 1</td>
<td>3</td>
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</tbody>
</table>


PPI Responsive Esophageal Eosinophilia

- 35 adult patients with EEI tx with rabeprazole 20 bid
  - 75% improvement
  - 50% EoE profile
  - 30% who responded had normal pH study

NMH experience: 30-40% improvement after PPI tx

PPI Responsive Esophageal Eosinophilia

- 35 adult patients with EEI tx with rabeprazole 20 bid
  - 75% improvement
  - 50% EoE profile
  - 30% response with normal pH study

Diagnostic criteria necessitate treatment of esophageal eosinophilia with double dose PPI for 8 wks followed by repeat EGD

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Medical Treatment: Swallowed topical corticosteroids

- Swallowed fluticasone
  - 440ug-880ug bid

- Oral viscous budesonide
  - 1mg bid
  - Mix w/ 10 packets sucralose

Topical Steroids

- Konikoff (n=10)
  - RCT 880 mcg/day
  - Pre-treatment: 84.8
  - Post-treatment: 18.7

- Noel * (n=20)
  - Retrospec 1220 mcg/day
  - Pre-treatment: 43.4
  - Post-treatment: 1

- Teitelbaum (n=13)
  - Prospective 860 mcg/day
  - Pre-treatment: 23
  - Post-treatment: 2.7

- Schaefer (n=40)
  - RCT 1760 mcg/day
  - Pre-treatment: 33.3
  - Post-treatment: 4.8

*Post treatment data on 16 patients.

Teitelbaum, et al; Gastroenterology 2002; 125:1660
Schaefer, et al; Clin Gastroenterol Hepatol 2006; 8:99
Budesonide

**Children**

<table>
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<tr>
<th>Eos</th>
<th>Pre</th>
<th>Post</th>
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<tr>
<td>OVB</td>
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<td>5</td>
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<tr>
<td>Plac</td>
<td>84</td>
<td>66</td>
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**Adults**

<table>
<thead>
<tr>
<th>Eos</th>
<th>Pre</th>
<th>Post</th>
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<tbody>
<tr>
<td>OVB</td>
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<td>5</td>
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<tr>
<td>Plac</td>
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<td>6</td>
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<tr>
<td>Budes</td>
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<td>6</td>
</tr>
<tr>
<td>Plac</td>
<td>62</td>
<td>57</td>
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</table>

Swallowed topical corticosteroids (fluticasone/budesonide) for initial duration of 8 wks is a first line medical therapy for EoE

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Topical Steroid: Endoscopic Improvement

Symptom recurrence in 88-94% of patients 3-9 months after cessation of fluticasone
Esophageal candidiasis 5-30%

Dietary Therapy in Children

- Kelly (n=10)
  - 100% Clinical Improvement

- Liacouras (n=164)
  - 95% Clinical Improvement

- Kagalwalla (n=25)
  - 100% Clinical Improvement

- Kagalwalla (n=35)
  - 74% histologic improvement

Kelly
Liacouras
Kagalwalla
0.5
1
4
41
39
59
80
Elemental
SFED
Kagalwalla

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Dietary Therapy in Adults

- Six Food Elimination Diet is highly effective at reducing symptoms, histology and endoscopic changes in adult EoE

*Prospective Study in Adults (n=50)*

6 wk elimination (milk, wheat, soy, egg, nut, seafood)

70% had peak eos <10/hpf
Endoscopic Response

Patient 1
Baseline  Post SFED  Reintro

Patient 2

Patient 3

Patient 4


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Post SFED: 78% had improvement in endoscopic features
Endoscopic Response

Patient 1
Baseline  | Post SFED  | Reintro

Patient 2

Reintroduction of Food Triggers Recreated Endoscopic Abnormalities

Patient 4

Effect of Food Reintroduction on Esophageal Eosinophilia

* p<0.0001

Causative Foods in Adult EoE

- 3 Pts had >1 Food Triggers
- SPT Predictive in 13%

Dietary Therapy in Adults in Spain
- Empiric elimination of wheat, rice, corn, milk, eggs, soy, peanuts, legumes, fish, shellfish

Prospective Study in Adults (n=67)
73% had eos <15/hpf after treatment
Causative Foods in Adult EoE in Spain

- Food Triggers
  - 36% had 1
  - 31% had 2
  - 33% >3

- Allergy testing not predictive

Dietary elimination can be considered as an initial therapy in the treatment of EoE in both children and adults

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Esophageal Dilation

- Dilations work but will need to be repeated
- Does not alter the underlying inflammation
- May cause significant disruption of the mucosa

Schoepfer A. Am J Gastroenterol. 2010 May;105(5):1062-70
**Esophageal Dilation**

- Dilations work but will need to be repeated.

Esophageal dilation, approached conservatively, may be used as an effective therapy in symptomatic patients with strictures that persist despite medical or dietary therapy.

*ACG Guidelines 2013*

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- **Management Algorithm**
Complications and Outcomes in Adults

- Chronic, relapsing condition - persistent eosinophilia if left untreated
- Stricture Formation (11-31%)
- Food impaction (30-55%)
- Small caliber (10%)
- Perforation
- Impact on QOL

Schoepfer A. Gastroenterology. 2013 Dec;145(6):1230-6.e1-2
Straumann A. Gastroenterology. 2003 Dec;125(6):1660-9
Maintenance therapy with topical corticosteroids and/or dietary restriction should be considered for all patients but particularly those with severe dysphagia, food impaction, high-grade esophageal stricture, and rapid relapse following initial therapy.
Advances in EoE: 2015?

Suspected EoE

- Symptom relief & Normal histology
- PPI x 8 wks
- EGD with Bx

PPI Responsive esophageal Eosinophilia vs GERD

Persistent Symptoms and/or Pathology
- R/O Non-compliance, Other Allergies, Persistent Reflux

Further Elimination or Elemental Diet Change to Topical/Systemic steroid Esophageal Dilation

Reintroduction Process to Identify Foods then Maintenance Topical/Systemic steroid Esophageal Dilation

Dietary therapy W/ SFED or Topical Corticosteroids

EoE

Allergy Referral

EGD with Bx

Symptomatic & Histologic remission

Persistent Symptoms and/or Pathology

R/O Non-compliance, Other Allergies, Persistent Reflux

Acknowledgements

- **Gastroenterology**
  - Ikuo Hirano MD, Peter Kahrilas MD, John Pandolfino MD, Angelika Zalewski
- **Allergy & Immunology**
  - Bruce Bochner PhD, Paul Bryce PhD, Anne Ditto MD, Carol Saltoun MD, Anju Peters MD, Robert Schleimer PhD, Paul Greenberger, MD
- **Pathology**
  - Guang-Yu Yang MD, Sam Rao MD
- **Nutrition**
  - Bethany Doerfler RD, Sally Ritz RD
- **Behavioral Science**
  - Laurie Keefer PhD, Tiffany Taft PsyD
- **Collaborators**
  - TIGERS, Alex Straumann MD (Switz), Sami Achem MD (Mayo), Steve Ackerman PhD (UIC), Glenn Furuta (Denver), Amir Kagawalla MD & Barry Wershil MD (CMH)
- **Research Support**
  - CURED, Sunshine Foundation, NIH
- **Northwestern EoE Patients & Families**
Thank You!