Eosinophilic Esophagitis

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EoE - Definition

- Clinicopathologic diagnosis
  - Presence of clinical symptoms related to esophageal dysfunction
    - Dysphagia, vomiting, abdominal pain, heartburn, feeding difficulty, etc.
  - Isolated esophageal eosinophilia
    - 15 or more eosinophils per hpf
    - Histology of remainder of GI tract normal
  - Exclusion of other GI disorders
    - Absence of pathologic GERD
      - Lack of response to PPI therapy or normal pH probe
    - Infection, Crohn’s disease, hypereosinophilic syndrome

Furuta, et al; Gastroenterology 2007; 133:1342.
EE is an allergic disorder

- Kelly, 1995
- 10 patients with refractory GERD symptoms and esophageal eosinophilia placed on an elemental formula
- Symptom resolution in 8 patients, symptom improvement in 2 patients
- Esophageal eosinophils decreased from a median of 41/hpf (range, 15-100) to a median of 0.5/hpf (range, 0-22) (p=0.005)
- Specific foods led to return of symptoms in 9 of 10 patients (milk, soy, wheat, peanut, egg)
Normal eosinophil values, per high power field (hpf):

- Esophagus (0)
- Gastric antrum (10)
- Duodenum (20)
- Colon (Right-20; Left-10)

Average accepted values
<table>
<thead>
<tr>
<th>Feature</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhinoconjunctivitis</td>
<td>57.4</td>
</tr>
<tr>
<td>Wheezing</td>
<td>36.8</td>
</tr>
<tr>
<td>Food allergy*</td>
<td>46</td>
</tr>
<tr>
<td>Family history atopy</td>
<td>73.5</td>
</tr>
<tr>
<td>Family history EoE</td>
<td>6.8</td>
</tr>
</tbody>
</table>

* H/O positive skin-prick, RAST, or clinical response

Esophageal Furrowing
Esophageal Rings
Distal Esophageal Stricture
## Diagnostic Comparison

<table>
<thead>
<tr>
<th></th>
<th>EoE</th>
<th>GERD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Intermittent</td>
<td>Persistent</td>
</tr>
<tr>
<td>pH Probe</td>
<td>Normal</td>
<td>Abnormal</td>
</tr>
<tr>
<td>Acid blockade</td>
<td>Unresponsive</td>
<td>Responsive</td>
</tr>
<tr>
<td>Endoscopy</td>
<td>Often repeated needed</td>
<td>Typically none or once</td>
</tr>
<tr>
<td>Pathology</td>
<td>&gt; 15 eos/hpf</td>
<td>1-5 eos/hpf</td>
</tr>
</tbody>
</table>
PPI Therapy

• Acid suppression
  – Useful in making the diagnosis of EoE
  – Useful for treating GERD symptoms associated with EoE
  – Proton pump inhibitor therapy alone, is insufficient for the treatment of EoE
Oral Steroid Studies

Liacouras (n=20)

Eos/hpf: 34.2
Pre-treatment: 1.5
Post-treatment: 1.3

Schaefer (n=40)

Eos/hpf: 29
Pre-treatment: 1.3
Post-treatment: 1.5

1 mg/kg BID; max 30 mg BID

Topical Steroids

![Bar chart showing Eos/hpf levels before and after treatment with different doses and study designs.](chart)

- **Konikoff** (n=18):
  - Design: RCT
  - Max Dose: 880 mcg/day
  - Pre-treatment: 84.6
  - Post-treatment: 19.7

- **Noel** (n=20):
  - Design: Retrospec
  - Max Dose: 1320 mcg/day
  - Pre-treatment: 43.4
  - Post-treatment: 1

- **Teitelbaum** (n=13):
  - Design: Prospective
  - Max Dose: 880 mcg/day
  - Pre-treatment: 23
  - Post-treatment: 2.7

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

*Post treatment data on 16 patients.

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Types of Dietary Therapy for EoE

- Selective Diet
  - Empiric Diet
  - Directed Diet

- Total Elimination Diet
  - Amino-Acid based formula
Dietary Management Amino Acid–Based Formula

- 172 Patients (128 nasogastric tube, 32 oral, 4 failed, 8 noncompliant)
  - 160 patients completed therapy
- Patients evaluated 4-6 weeks after instituting diet

<table>
<thead>
<tr>
<th>160 Patients</th>
<th>Pre-diet</th>
<th>Post-diet</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eosinophils per hpf</td>
<td>38.7 ± 10.3</td>
<td>1.1 ± 0.6</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>30</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>GERD symptoms</td>
<td>134</td>
<td>3</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

Selective Elimination Diet

- Removal of a limited number of foods
- Types of dietary restriction
  - Empiric (based on history of the most likely foods)
    - “The usual suspects”
    - Milk, soy, egg, peanut, wheat, fish, meats
  - Directed (based on allergy testing or clinical symptoms)
    - Clinical history
    - Allergy testing (skin prick tests, atopy patch tests)
Dietary Restriction vs. Elimination

- % of patients clinically and histologically improved
- # of esophageal eosinophils after treatment

Suggested Algorithm for Management Of Eosinophilic Esophagitis

Suspected EoE

- 0-4 Eos/hpf
- PPI 4-8 wks, ongoing or intermittent symptoms

EGD with Bx

- >15 Eos/hpf
- 5-14 Eos/hpf

Probable GERD

GERD or indeterminant EoE

Persistent Symptoms and/or Pathology
R/O Candida/Non-compliance

Follow up

- Consider Maintenance Therapy
- Symptomatic & Histologic remission

Further dietary restriction
Elemental Diet
Systemic steroid
Esophageal dilation
High dose topical steroid (?)
Biologic therapy (?)

EoE

Topical steroid or Dietary therapy