Nuts and Bolts of Dietary Management in EoE from Pediatrics to Adults

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Disclosures

• Employment
  Children’s Healthcare of Atlanta
  Division of Pulmonology, Allergy/Immunology, Cystic Fibrosis, and Sleep

• Financial
  Nutricia North America
Nuts and Bolts of Dietary Management in EoE from Pediatrics to Adults

Learning Objectives

• Participants will
  – Gain a general understanding of EoE
  – Learn the different types of elimination diets
  – Become familiar with feeding issues that may develop as a result of EoE
  – Be able to provide patients and families with survival skills to help them be successful with their elimination diet
EoE Definition

Eosinophilic esophagitis represents a chronic, immune/antigen-mediated esophageal disease characterized clinically by symptoms related to esophageal dysfunction and histologically by eosinophil-predominant inflammation that is not responsive to acid blockade with a proton pump inhibitor (PPI)
EoE Definition

• 15 eosinophils/hpf is considered a minimum threshold for a diagnosis of EoE
• Endoscopy is currently the only reliable diagnostic test
  – Must be done while on PPI to rule out GERD as possible cause of increased eosinophil levels
What is an Eosinophil?

- White blood cells
- Formed in bone marrow
- Function
  - Movement to inflamed areas
  - Anti-parasitic
  - Bactericidal
  - Involved in allergic reactions
  - Modulate inflammatory responses
EoE Symptoms in Children

- Vomiting
- Nausea
- Dysphagia
- Chest pain
- Heart burn
- Early Satiety
- Poor Weight Gain
- Poor Appetite
- Abdominal Pain
Assessing your Pediatric Patient

General Characteristics

- Children 6 and under
  - Feeding Problems
- Children 6-12
  - Vomiting
- Children 10-14
  - Abdominal Pain
  - Dysphagia
- Children 14-20
  - Food bolus impaction

Feeding Problems

- Does not advance to solid foods
- Self restricts
- Drinks a lot of water with meals
- Chews food for a long time
- Slow eater
Assessing Your Adult Patient

- Occurs more often in males
- May have been misdiagnosed for a number of years or never diagnosed
- Average age of diagnosis is 30 years old
Assessing Your Adult Patient

- Requires a lot of liquids with meals
- Dysphagia
- Reports that feels like food is going to get stuck
- Esophageal narrowing
  - Requiring dilation
- Food bolus impaction
- Chronic, poorly controlled heart burn
Management Options

• PPI Therapy
• Elimination Diet
  – Directed
  – Empiric
• Elemental Diet
• Topical Swallowed Corticosteroids
• Combination of diet and swallowed corticosteroids
  – No FDA-approved medicines are available for EoE (Chehade, 2015).
Medication

• Systemic steroids reserved for severe cases
• Topical swallowed corticosteroids
  – Fluticasone or Budesonide
  – Coats the esophagus
  – Fewer side effects than systemic steroids
• Does not “cure” EoE
• Complications with long term use
  – Viral esophagitis
  – Fungal esophagitis
  – Bone mineralization
  – Decreased linear growth
Elimination Diets

• Goals
  – Reduce or Eliminate EoE symptoms
  – Find Safe Foods
  – Make the diet as varied as possible
  – Determine trigger foods
  – Maintain balanced nutritional status
    • Supplementation with a hypoallergenic formula or multivitamin is often necessary
  – Maintain quality of life
  – Adherence from the patient and family
Elimination Diets

• Empiric Six Food (really 8) Elimination Diet Avoids
  – Milk
  – Egg
  – Wheat
  – Soy
  – Peanut
  – Tree Nut
  – Fish
  – Shellfish

Research has shown effective in 73% of pediatric patients, 71% of adult patients
Elimination Diets

• Empiric Four Food Elimination Diet Avoids
  – Milk
  – Egg
  – Soy
  – Wheat

Research has shown effective in 60% of pediatric patients, 46% of adult patients
Elimination Diets

• Guided elimination via allergy testing
  – Atopy patch testing (APT)
    • Controversial – different centers achieve different success rates
    • More centers are deciding to stop APT
  – Does the right allergy test exist to help detect problem foods in EoE?
    • EoE involves both IgE-mediated and cell mediated mechanisms
Elemental Diet

• 100% oral intake is amino acid based formula
  – There are several brands available
  – Manufacturers are introducing new flavors
  – May require administration via feeding tube if a patient is unable to drink enough to meet energy needs

• Reserve for severe patients or those that fail other diet manipulations

• This is not a long term solution for management of EoE
Elimination Diet

• In Children:
  – Milk is the most common trigger food (74%)
  – Wheat is the second most common trigger food (26%)
  – Followed by egg, soy, peanut

• In Adults:
  – Wheat is the most common trigger food (60%)
  – Milk is the second most common trigger food (50%)
  – Followed by soy, nut, egg
## Diet Choices

<table>
<thead>
<tr>
<th>Definition</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elemental</td>
<td>100% amino acid based formula</td>
<td>• Palatability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Impacts quality of life</td>
</tr>
<tr>
<td>Direct Elimination</td>
<td>Diet avoids foods based on allergy testing</td>
<td>• Testing inconsistent across centers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Some avoidance may be unnecessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Empiric milk elimination improves response</td>
</tr>
<tr>
<td>Empiric Elimination</td>
<td>Diet avoids the major food allergens- variations</td>
<td>• Some avoidance may be unnecessary</td>
</tr>
<tr>
<td></td>
<td>exist (milk, wheat, egg, soy, peanut, tree nut,</td>
<td>• Cost</td>
</tr>
<tr>
<td></td>
<td>fish, shell fish)</td>
<td>• Can be nutritionally incomplete</td>
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Which Diet?

- Consider the patient’s and/or family’s:
  - Ability to Follow the Diet and Their Lifestyle
  - Current Nutritional Status
  - Endoscopic Findings
  - Consider Results of Allergy Evaluation
  - What is the Patient and/or Family Willing to do?
### Nutrients at Risk

<table>
<thead>
<tr>
<th>Allergen</th>
<th>Vitamins and Minerals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>Vitamin A, Vitamin D, Riboflavin, Pantothenic Acid, Vitamin B12, Calcium, Phosphorus</td>
</tr>
<tr>
<td>Egg</td>
<td>Vitamin B12, Riboflavin, Pantothenic Acid, Biotin, Selenium</td>
</tr>
<tr>
<td>Soy</td>
<td>Thiamin, Riboflavin, Pyridoxine, Folate, Calcium, Phosphorus, Magnesium, Iron, Zinc</td>
</tr>
<tr>
<td>Wheat</td>
<td>Thiamin, Riboflavin, Niacin, Iron, Folate (if fortified)</td>
</tr>
<tr>
<td>Peanut</td>
<td>Vitamin E, Niacin, Magnesium, Manganese, Chromium</td>
</tr>
</tbody>
</table>
MVI Supplementation for all Patients

• Conduct a diet analysis first to determine what macro and micro nutrients are over represented in the diet and which ones are deficient
• No one vitamin/mineral supplement is best – depends on the food the patient is currently eating
• When recommending supplements, be careful of potential toxicities
Vitamins

Always read the label for allergy warnings!
Hypoallergenic Formulas

• Regularly used to supplement an elimination diet to achieve adequate nutritional intake of protein and key micronutrients

• Research has shown that approximately 1 in every 3 patients on an elimination diet require daily amino acid-based formula supplementation to achieve adequate nutritional intake

• Infant and 1+ formulations available
Nutricia offers The Navigator Service which provides comprehensive assistance to families and health care providers regarding reimbursement.

Source: http://www.neocate.com/reimbursement/insurance-coverage-map/
Elimination Diet Strategies

• Keep mealtime as normal as possible
• No force feeding
• Flavor elemental formulas with
  – Blenderized fruits, Crystal Lite, Coffee Syrups
• Focus on balanced, healthy eating
• Add fortified products (cereals, vegan protein powders, etc)

Focus on WHAT YOU CAN EAT!
Elimination Diet Strategies

• A Mediterranean type diet can be a healthy, flavorful solution for an elimination diet
  – Lean proteins
  – Healthy fats
  – Vegetables
  – Fruits
  – Grains/Starch
    • Quinoa, Amaranth, Tapioca, Millet, Sorghum, Oats (Gluten Free), Corn, Rice, Potato
Elimination Diet Strategies

• Buy less processed food
  – Items with 5 ingredients or less
  – Outer aisles of the grocery store

• Patients and their family may need to learn how to cook, store, and freeze meals

• This diet does forces patients to get more connected to the food they buy and eat
  – Have we gotten too disconnected from our food in the United States?
Elimination Diet Strategies

• Avoid cross contamination
  – Salad bars or buffets
  – Cooking utensils, strainers
  – Toaster
  – Cook top
  – Fried foods
Elimination Diet Strategies

• Eating Out
  – Call ahead to speak with manager
  – Review with the wait staff about how you need your food prepared
  – State that your food needs to be prepared on a clean surface with clean utensils
  – Ask about preparation methods
  – Try to go during off peak hours
  – BE SPECIFIC. Tell them what you can have
Elimination Diet Strategies

The following are highly refined & considered safe

– Heat processed oils (do not purchase imported oils)
  • Olive, canola, grape seed, peanut, soybean
– Plain white table sugar
– Vitamin C (ascorbic acid)
– Artificial colors
– Artificial flavors
– Corn syrup, corn syrup solids, high fructose corn syrup
Elimination Diet Strategies

• At school parents should
  – Have a 504 plan in place that documents what foods must be avoided
  – Speak with school nurse, cafeteria manager, school district dietitian
  – Speak with the teacher
  – Encourage classroom celebrations that do not involve food (movie, extra recess, etc instead of a pizza party)

• Encourage families to send some of their own food, if possible
Elimination Diet Strategies

• At college
  – Speak with the manager of dining services
  – Speak with a nurse or manager of the campus clinic

• Food scouting mission prior to the first day
  – Restaurants
  – Grocery Store / Convenience Store

• Prepare an emergency food kit
  – Power outage
  – Miss dining hours
Teenagers

• Typically highest risk group in all food allergy
• They do not want to be different from their friends
• Feel invincible
• Becoming more independent
• Need to feel empowered about their food choices
• Need some autonomy
Teenagers/Young Adults

• Make recommendations that include them
• Ask them what their goals are for their diet and how they want their body to look
• What does success look like to them?
• Connect them with other teenagers with EoE or other types of food allergy or intolerance
  – No one likes to feel like they are alone
• Ask them what is the greatest source of stress related to EoE...it may not be the food
Adults

- Alcohol
  - Gluten free beer
  - Organic, vegan wine

- Cross Contamination

- If has children without food allergy or EoE, parent should provide all types of food

- Parents with EoE that have children without EoE need to keep their own condition in perspective
Adults

- Many prefer to be on medication
- Dietary modification is gaining acceptance as first line management
- Dietary approaches have been shown to be effective in adults
  - Some may do a combination of medication and diet elimination
- Symptoms may change over time
  - Aeroallergens may influence EoE symptoms
- EoE triggers may change over time as the immune system does not stay constant
Food Labels

• NIAID guidelines suggest avoiding products that have an allergy advisory statement
• Precautionary labels are voluntary and not regulated by the FDA
• Avoiding foods with the precautionary label for a patient’s specific allergen is the safest advice
Elimination Diet Strategies

Websites
• Amazon
• Vitacost

Support Groups
• Oley Foundation
  – Message board where families offer formula they cannot use – only pay shipping charge

Grocery store options
• Sprouts Farmers Market
• Trader Joe’s
• Aldi
• International grocery stores
• Wal-Mart
• Target
Got Milk?

Alternative Milks – Fortified is best

- Almond Milk
- Soy Milk
- Oat Milk
- Hemp Milk
- Coconut Milk
- Rice Milk

🌟 These milks should be used to add variety to the diet and should not be considered as a primary source of nutrition
Elimination Diet Strategies

• Replacing wheat flour
  – Wheat, Spelt, Kamut

• Replacing gluten flour
  – Wheat, Rye, Barley

• Wheat free and gluten free
  – Rice, brown rice, sorghum, amaranth, corn, millet, buckwheat, teff, quinoa, garbanzo bean, fava bean, oat, coconut, almond
Elimination Diet Strategies

Replacing Butter

- Spreads that contain soybean oil and flaxseed oil
- Sunflower seed butter
- Coconut oil
- Palm fruit oil
- Avocado, olive, hemp oils are safe but have a stronger flavor
Elimination Diet Strategies

• Birthday Party Ideas
  – Plan the party during traditionally non-meal hours
    • Example: 1:30-3:30pm
  – Cake ideas

http://community.kidswithfoodallergies.org/blog/birthday-cakes-limited-diet-allergy

Homemade Popsicles
Food Reintroduction

- How many to introduce at one time depends on the center and the patient’s disease state
- Use single ingredient foods for reintroduction
- Consider what is important to the patient to have back in the diet
- Food must be eaten daily (age appropriate serving size)
Suggested Food Reintroduction

**Pediatrics**
- Fish
- Shellfish
- Peanut
- Tree nut
- Soy
- Wheat
- Egg
- Milk

**Adults**
- Fish
- Shellfish
- Egg
- Peanut
- Tree nut
- Soy
- Milk
- Wheat

Source: NASPHGAN
Feeding Issues

• Picky eating may be due to a real medical issue
• When kids do not have the vocabulary to tell caregivers what is wrong, they just do not eat well as a means for self preservation
  – Fear of food getting stuck
  – Food does get stuck
  – Increased GERD symptoms
  – Feels like it is just hard to swallow
Feeding Issues

- Keep meal time low stress
- Make the interactions between parents, children, and food positive
- Never force a child to eat
  - It does not work
  - Creates more behavioral problems
- Parents have to trust their child’s instinct on eating
Feeding Issues

• The Division of Responsibility (Ellyn Satter Model)
  – Parents provide the what, when, the where
  – The child decides how much

• SOS Model (Sequential Oral Sensory, Dr. Kay Toomey)
  – Done in a therapy setting
  – Treatment team: RD, OT, SLP, Psychology

• Speech Language Pathologists
  – Oral motor development

• Occupational Therapy
  – Sensory integration

• Behavioral Therapy
  – To address the fear and anxiety around food
Feeding Issues

• Know when to say when – seek outside therapy
• Patient continues to self-restrict
• Unintended weight loss
• Look for signs of deficiencies (remember previous slide)
• If not corrected, patient could end up with a G-tube to meet nutritional requirements
The EoE Unknown

• Natural history of EoE and rates and predictive indexes of complications
  – Food impaction, esophageal stricture, esophageal narrowing
• How do you treat patients with isolated esophageal eosinophilia that are asymptomatic?
  – Could the esophagus still change over time?
In Summary…

- Dietary avoidance is the best management of EoE in all ages
- Elimination diets change over time
- Supplementation with an amino-acid based formula is often required to keep the diet nutritionally complete
- Encourage your patients to get creative with their food to ensure the most variety in their diet
- RDs should educate their patients on survival skills – life is happy and healthy on restricted diets!
Resources

• APFED – American Partnership for Eosinophilic Disorders – www.apfed.org
• CURED – Campaign Urging Research for Eosinophilic Disorders - www.curedfoundation.org
• CoFar – Consortium on Food Allergy Research https://web.emmes.com/study/cofar/
• Nutricia – www.neocate.com/footsteps
• Abbott – www.elecare.com
• Children’s Hospital of Orange County – www.choc.org
• Gluten Free Drugs www.glutenfreedrugs.com
Resources

- Allergen-Free Baker’s Handbook by Cybele Pascal
- Sweet Debbie’s Organic Treats by Debbie Adler
- Food allergy websites for recipes
- Cookbooks at library
- Gluten Free and More Magazine
- Content Checked – www.contentchecked.com
- Shop Well – www.shopwell.com
- Allergy Eats – www.allergyeats.com
- Food Hypersensitivity Dietitian Network – for RDs only. Contact alexia.beauregard@choa.org to be added to the group
References

- NASPHGAN Eosinophilic Esophagitis: Diagnosis and Management. Slide Deck made available by the NASPHGAN Foundation http://www.naspghan.org/content/52/en/Eosinophilic-Esophagitis
References

- Ellyn Satter Institute [www.ellynsatterinstitute.org](http://www.ellynsatterinstitute.org)
- SOS Approaches to Feeding [www.sosapproach.com](http://www.sosapproach.com)
Thank you!

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