Eosinophilic Asthma: Medications & Management

April 29, 2021

Disclosures: NONE

Disclaimer:
Focus on FDA-approved treatments for Eosinophilic Asthma

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A Look at Eosinophilic-driven DISEASES

A few facts about asthma

25 MILLION Americans diagnosed
1 in 10 CHILDREN
$80 BILLION annual costs

3,168 DEATHS annually
13.8 MILLION missed school days per year
14.2 MILLION missed work days per year

3 in 5 limit physical activity
71% MISUSE inhalers
1 in 5 CANNOT AFFORD medications
Understanding Asthma

**Asthma** is a **syndrome** rather than a single disease!

Environmental and genetic factors → Inflammation → Airway hyper-responsiveness → Reversible airway obstruction → Clinical symptoms (cough, wheezing, dyspnea)

Asthma is a syndrome rather than a single disease!

**What is Asthma?**

Chronic obstructive inflammatory lung “syndrome”

Recurrent episodes of wheeze, cough, shortness of breath and chest tightness

Symptoms vary over time and in intensity
What is Asthma?

Confirmed airflow obstruction:
- Spirometry with positive response to bronchodilator “reversibility”
- Positive bronchial challenge test (Methacholine or Exercise test)
- Inflammatory cells infiltrate airways: edema, thickened mucus, bronchospasm

Heterogeneous mix of subtypes “phenotypes”
- Allergic Asthma
- Aspirin Exacerbated Respiratory Disease
- Eosinophilic Asthma
- TH2-Low Asthma

Asthma Phenotypes & Assessment

Phenotype: unique pathophysiology that drive symptoms, mucosal inflammation and airway smooth muscle contraction

Phenotype assessment:
- Co-Morbidity
- Induced sputum analysis
- Bronchoscopy
- Complete blood cell count (AEC)
- Serum IgE
- Environmental allergy assessment (spt, sigE)
- FeNO (fractional exhaled Nitric Oxide)
What is Eosinophilic Asthma?

- Develops in adulthood
- Severe & persistent form of asthma
- Frequent exacerbations
- Refractory symptoms despite steroids
- Fixed airway obstruction
- Eosinophil inflammation within the airways
  - Lung tissue or sputum (Bronchoscopy)
  - Peripheral blood is a surrogate marker
- Co-Morbidities:
  - Chronic Sinusitis & Nasal Polyps
  - Aspirin / NSAID Hypersensitivity

Asthma Management: Assessing Control
Asthma Management: Treatment

Goal of Treatment: Reduce symptoms and flares, Improve quality of life, Maintain control

- Short Acting-Bronchodilator:
  - As needed for symptoms
- Inhaled Steroids (+/- Long Acting-Bronchodilator):
  - Oral thrush, dysphonia
- Oral Corticosteroids:
  - Greater bioavailability of medication
  - Increased risk of side effect with higher doses and longer duration of use
  - Easy bruising, osteoporosis, cataracts, glaucoma, adrenal suppression, diabetes, hypertension
- Biologic Therapies:
  - Precision therapies that target the specific source of inflammation
  - Reduction in exacerbations & symptoms, Improvement in quality of life
  - Taper / Discontinue use of oral glucocorticoids
  - Indication: severe asthma, adherent to high-dose inhaled steroids, frequent flares

From: © Global Initiative for Asthma, www.ginasthma.org
GINA 2020, Box 3-4A
Biologic Therapies for Eosinophilic Asthma

<table>
<thead>
<tr>
<th>Route</th>
<th>Frequency</th>
<th>Target</th>
<th>Biomarker</th>
<th>Side effects</th>
<th>Other indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mepolizumab (Nucala)</td>
<td>SC</td>
<td>q4weeks</td>
<td>Binds IL-5; reduction in eosinophil production and survival</td>
<td>EAC</td>
<td>Herpes Zoster Anaphylaxis / Hypersensitivity Parasite infection</td>
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<tr>
<td>Reslizumab (Cinquair)</td>
<td>IV</td>
<td>q4weeks (weight based dosing)</td>
<td>Binds IL-5; reduction in eosinophil production and survival</td>
<td>EAC</td>
<td>Anaphylaxis / Hypersensitivity Parasite infection -</td>
</tr>
<tr>
<td>Benralizumab (Fasenra)</td>
<td>SC</td>
<td>q4weeks x 3; q8 weeks</td>
<td>Binds IL-5 receptor, reduction in eosinophil production and survival, activates NK to induce apoptosis of eosinophils &amp; basophils</td>
<td>EAC</td>
<td>Anaphylaxis / Hypersensitivity Parasite infection -</td>
</tr>
<tr>
<td>Dupilumab (Dupixent)</td>
<td>SC</td>
<td>q2 weeks</td>
<td>Binds IL-4 receptor a subunit, inhibit IL-4 &amp; IL-13 cytokines</td>
<td>EAC, FeNO, Oral steroid dependence</td>
<td>Anaphylaxis / Hypersensitivity Keratitis Atopic Dermatitis, Chronic Sinusitis w/ Nasal Polyposis</td>
</tr>
</tbody>
</table>

Mechanism of Biologic Therapies
Questions posed by Biologic Therapies

- Which is the most effective?
- Best biomarkers to predict effective response?
- Therapeutic non-responders: when to switch / stop medications?
- Combination of biologic agents or combination of targets?
- Length of treatment?
- New agents in development

Risk Factors for Exacerbations

- Poor asthma control
- Lack of medication adherence
- Incorrect inhaler technique
- Smoking
- Exposure to triggers
- Uncontrolled co-morbid disease
Inhaler technique is crucial

- Metered Dose Inhalers
- Dry Powder Inhalers
- Breath-actuated devices
- Respimat devices
- VHC / Spacers
- Nebulizer

Non-Pharmacologic Treatment:
Avoidance of Asthma Triggers

- Irritants: smoke, diesel exhaust
- Air pollution: Indoor & Outdoor
- Strong odors / fragrance
- Respiratory infection:
  - Annual influenza vaccination
  - Pneumococcal vaccination
- Exercise
- Stress or strong emotions (laughing, crying)
- Sudden change in air temperature or humidity (cold air)
- Hormonal changes
Non-Pharmacologic Treatment: Assessment & Treatment of Co-Morbid Disease

- Chronic Sinusitis with or without Nasal Polyposis
- Aspirin / NSAID Hypersensitivity
- Obesity
- Tobacco abuse
- Obstructive Sleep Apnea
- GERD
- Depression & Anxiety
- Allergic conditions: Allergic Rhinitis, Atopic Dermatitis, Food Allergy

Asthma Management: Follow-Up

Initial Visit
- Confirmation of diagnosis if necessary
- Symptom control
- Modifiable risk factors & comorbidity
- Lung function
- Inhaler technique and adherence
- Non-pharmacological strategy
- Patient (and parent) preferences and goals

Follow-Up
- Symptom control, Exacerbation frequency
- Medication side effect
- Lung function
- Asthma medications (adjust up or down)
- Patient satisfaction
Monitoring Symptoms

Expiratory Peak Flow Meter: device measuring peak expiratory flow rate

Frequency of symptoms:
- Nocturnal awakenings
- Activity limitation
- Use of rescue inhaler

Symptom tracker app
- AsthmaTracker
- Asthma Storylines

Frequency of exacerbations:
- Need for systemic steroids
- ED / UC / Hospital visits
- History of intubation need

Determination of asthma control and treatment decisions

Management of Asthma Exacerbation

When to call your physician
- Asthma symptoms are worsening
- Asthma symptoms are not responding to asthma action plan

When to call 911
- Unable to take a good deep breath
- You can only talk in short phrases
- Persistent cough
- Feel too exhausted to breath
- Increased work to breathe
- Easier to breathe when sitting & leaning forward
- Lips and/or fingernails bluish-gray
- Sweating even though skin feels cold and clammy
Preparation for Physician Visit

Seek care of allergist/immunologist or pulmonologist

Symptom logs (apps, journals, pfm values)

Health records:
- Prior hospitalization & ED records
- Prior medications including use of oral steroids

Bring all medications to your visit

Discussion points with physician

- Confirmation of asthma diagnosis
- Phenotype assessment indicated
- Treatment plan
  - Types of medications & indications
  - Frequency and duration of medication
  - Inhaler technique
  - Medication side effects
  - Patient preference
- Asthma action plan & emergency asthma management
- Determination if treatment is effective
- Frequency of follow-up visits
- Assessment of comorbidity
Here's what you'll find in this toolkit:

- **About Eosinophilic Asthma**
  Learn about this severe subtype of asthma, a chronic lung disease.

- **Diagnosis & treatment**
  Read about how eos asthma is diagnosed and treatment options.

- **Tips**
  Explore practical strategies to help improve quality of life with eos asthma.

- **FAQs**
  Read answers to questions commonly asked by patients and caregivers.

- **Specialists**
  Review information about the specialists that help treat and manage eos asthma.

- **Glossary**
  Learn terms commonly used when discussing eos asthma.

- **Research**
  Learn about eos asthma research and clinical trials.

- **Resources**
  Connect with others and tap into a supportive community.
EosAsthma

TIME FOR QUESTIONS
Resources for more information

- Eos Asthma ToolKit
  - Eosasthma.org
- Asthma & Allergy Network
  - Allergyasthmanetwork.org
- American Partnership for Eosinophilic Disorders
  - https://apfed.org/

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