Overview of Allergic Rhinitis: Impact, Diagnosis, and Treatment

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Impact of Allergic Rhinitis

- One of the most common allergic diseases in the U.S.\(^1\)
- Affects over 40 million Americans\(^1\)
- Fifth most common chronic illness\(^2\)
- Most prevalent chronic condition in patients under 18 years of age\(^2\)
- Both physical and mental health status adversely affected\(^1\)
- 3.8 million lost work and school days annually\(^3\)
- Direct costs approximately $4.5 billion/year\(^3\)

Seasonal/Perennial Allergic Rhinitis Characteristics

• **Seasonal allergic rhinitis**
  – Nasal congestion
  – Watery rhinorrhea
  – Repetitive sneezing
  – Pruritus of the eyes, nose, ears, and throat
  – Watery eyes

• **Perennial allergic rhinitis**
  – Prominent and severe nasal blockage/congestion
  – Postnasal drainage

• **Perennial allergic rhinitis patients may have seasonal exacerbation's**
Natural History of Allergic Rhinitis

- Onset common in childhood, adolescence, and early adulthood
- Symptoms often wane in older adults, but may develop or persist at any age
- No apparent gender selectivity or predisposition
- May contribute to other conditions:
  - Sleep disorders
  - Fatigue
  - Learning problems

Rhinitis Often Associated With Other Chronic Conditions

- Asthma\(^1\)
- Eustachian tube dysfunction and otitis media\(^1\)
- Rhinosinusitis\(^1\)
- Nasal polyposis\(^1\)
- Allergic conjunctivitis\(^1\)
- Atopic dermatitis\(^1\)
- “Sick Child Syndrome” \(^2\)

Pathogenesis of Asthma and Rhinitis

Allergen

Antigen-Presenting Cell

GM-CSF

Th-2

IL-3, IL-5

GM-CSF

IL-4, IL-13

IL-3

Eosinophil

IgE

Histamine

Tryptase

ECP

Mast Cell

B-Lymphocyte

Basophil

TNF-α

Macrophage

CysLTs, Adhesion Molecules,
NO, O₂, PGs, PAF

Blood Vessel Leakage, Edema

Smooth muscle proliferation
Fibroblast proliferation
Collagen synthesis

Bronchial smooth muscle contraction

Symptoms

Airway Narrowing

Epithelial injury

Mucus hypersecretion

Bronchial Hyperreactivity

Nonspecific Stimuli
Allergic Rhinitis and Asthma

- Some patients report increased asthma symptoms during pollen season
- Rhinitis and asthma involve common respiratory mucosa
- Inflammation involved in pathogenesis of both allergic rhinitis and asthma
  - Allergic reactions in nasal mucosa can potentially worsen asthmatic inflammatory processes in lower airways

Inflammation: Common Component of Allergic Rhinitis and Asthma

• Inflammation in the nose may increase lower airway hyperresponsiveness

• Possible mechanisms include:
  – Nasal allergic response altering bronchial responsiveness through nasobronchial reflex
  – Mouth breathing caused by nasal obstruction resulting in bronchospasm in reaction to cool, dry air
  – Pulmonary aspiration of nasal contents

Diagnosis of Allergic Rhinitis: Medical History

- Ask patient about specific symptoms and symptom patterns, including:
  - Onset, duration, severity and progression
  - Relationship to seasons
  - Associated ocular, pharyngeal, and systemic symptoms
  - Incidence of recurrent sinus or ear infections
  - Causal and exacerbating factors
  - Association with skin rashes (suggesting atopic dermatitis)
  - Association with asthma flare-ups
  - Relationship to drug use (medications and illicit drugs)
  - Relationship to GI symptoms (suggesting food allergy), especially in children

Presentation of Allergic Rhinitis: Clues

Allergic Rhinitis: Reported Symptoms

Percent (%) of Patients Experiencing Symptoms

- Stuffy Nose: 58%
- Sneezing: 52%
- Postnasal Drip: 51%
- Runny Nose: 46%
- Stuffy Head: 43%
- Itchy Eyes: 42%

Data on file. Glaxo Wellcome Inc.
Systemic Symptoms of Allergic Rhinitis

- Weakness
- Malaise
- Irritability
- Fatigue
- Difficulty concentrating
- Decreased appetite

Triggers

✓ Smoke & Strong Odors
✓ Pets
✓ Mold
✓ Dust, Dust mites
✓ Pollen (grass, trees, plants, & weeds)
✓ Pests (cockroaches or rodents)
✓ Certain Foods
✓ Infections (flu and colds)
✓ Exercise
✓ Changes in Weather
✓ Strong Emotions
✓ Pollution
✓ Some medications (aspirin)
Diagnostic Allergy Testing
Tests Performed in the Diagnostic Allergy Laboratory

• Allergen-specific IgE (over 200 allergen extracts)
  – Pollen (weeds, grasses, trees),
  – Epidermals, dust mites, molds,
  – Foods,
  – Venoms,
  – Drugs,
  – Occupational allergens (e.g., natural rubber latex)

• Total Serum IgE (anti-IgE; ABPA)

• Multi-allergen screen for IgE antibody
Diagnostic Decision Point

Value of the Immuno Cap Assay for Peanut Protein kU/L

Percentage of positive reactions

- 5
- 2.5
- 15
- 10
- 100

Y-axis: kU/L
X-axis: Percentage of positive reactions
Skin Testing

Photographs courtesy of Dr. Ed Philpot.
Allergy Skin Testing

- Skin testing remains the central test to confirm allergic sensitivity when it can be performed \(^1\).
- Skin testing is fast (15-30 minutes), safe, sensitive and involves minimally invasive procedures which can be cost effective.
- When performed correctly, skin testing is reproducible.
- Skin testing has demonstrated good correlation with results of nasal challenge\(^2\) and bronchial challenges \(^3\).
- Results of skin test should always be used as an adjunct to the clinical history and physical examination when making the diagnosis of allergic disease.

\(^1\) Oppenheimer et al, Ann Allergy 2006:S1:6-12
\(^2\) Bousquet et al, Clin Allergy 17:529-36, 1987
\(^3\) Cockcroft et al, Am Rev Respir Dis 135:264-7., 1987
Managing Patients With Allergic Rhinitis

Four general principles of allergy management:

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<thead>
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Managing Patients With Allergic Rhinitis

• Medications
  – Antihistamines
  – Decongestants
  – Antihistamine-decongestant combinations
  – Corticosteroids
  – Mast-cell stabilizers
  – Anticholinergics

• Palliative treatment may help
  – Nasal lavage with warm salt water (with or without baking soda)
  – Inhalation of warm mist through the nose for 10 to 15 minutes, 2 to 4 times per day

• Non-Sedating Antihistamines
  – Fexofenadine (allegra) 180 mg QD
    • Pediatric 30 mg QD
  – Loratidine (claritan) 10 mg QD
    • Pediatric Syrup 5 QD
  – Levocetirizine (Xyzal) 2.5-5 QD

• Low Sedating Antihistamines
  – Cetirizine (zyrtec) 10 mg QD
    • Pediatric Syrup 5 mg QD

• Nasal Spray
  – Azelastine 1-2 sprays each nostril
Effect of Antihistamines on Childhood Learning in Children With Allergic Rhinitis

Treating Allergic Rhinitis With Topical Nasal Corticosteroids
Nasal steroids provide the most effective symptom relief of allergic rhinitis.

Joint Task Force Recommendations

“Nasal steroids provide the most effective symptom relief of allergic rhinitis.”

– Joint Task Force on Practice Parameters in Allergy, Asthma and Immunology; August 2008.
Treatment of Congestion

“Intranasal corticosteroids are the first line of therapy when obstruction is a major component of the patient’s rhinitis.”

Topical Corticosteroid Agents

- Fluticasone propionate (flonase aqueous)
- Fluticasone Furoate (Veramyst)
- Beclomethasone dipropionate
  - Aqueous (beconase, vancenase AQ and DS)
  - Aerosol (QNASL)
- Budesonide (rhinocort aqueous)
- Zetonna (ciclesonide aerosol)
- Flunisolide (nasarel aqueous)
- Mometasone furoate (nasonex aqueous)
- Triamcinolone (nasacort aqueous and aerosol)
Intranasal Steroids Restores Integrity at the Epithelial Layer of the Nasal Mucosa

- Biopsies of nasal mucosa demonstrated that intranasal steroids effectively reduced inflammation.
- A 1-year analysis of intranasal steroids involving 52 patients with perennial allergic rhinitis found no evidence of nasal atrophy.
- The direct relationship of these findings to long-term symptom relief is not known.
Combination Drug Therapy

- **Intranasal**
  - cromolyn sodium
  - corticosteroids
  - antihistamines
  - saline
  - decongestants
  - ipratropium bromide

- **Oral**
  - antihistamines
  - decongestants
  - combination drugs
  - corticosteroids
  - Leukotriene receptor blockers
Pharmacologic Management of Allergic Rhinitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>Sneezing</th>
<th>Itching</th>
<th>Congestion</th>
<th>Rhinorrhea</th>
<th>Eye Symptoms</th>
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<td>Oral Antihistamine</td>
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<td>Intranasal Mast Cell Stabilizers</td>
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– provides no benefit; +/- provides little or minimal benefit; + provides modest benefit. ++ provides substantial benefit. This table represents a consensus of the Task Force’s opinion. Referral to and/or consultation with an allergy /immunology specialist is recommended. 

Criteria for Allergen Immunotherapy

• The patient should present with
  – Detectable immediate hypersensitivity, and
  – A history of clinically significant airway symptoms from exposure to aeroallergens which:
    • Compromise normal routine
    • Are not well controlled by avoidance and medication (or patient/family is reluctant to use appropriate medications)
Pitfalls With Immunotherapy

- Misdiagnosis
- Unrealistic patient expectations
- Exposure to new allergens at home/school
- Inadequate dose or duration of treatment
- Use of unproven methods
- Smoking (passive or active)
- Development of significant infections