

Allergic Rhinitis

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Allergic Rhinitis

- Inflammation of the mucous membranes of the nose & upper respiratory system caused by exposure to inhaled allergens that elicit a specific immunologic response mediated by IgE.
- Characterized by
 - rhinorrhea (nasal discharge)
 - pruritus (itching)
 - sneezing
 - Congestion (not in all pts, but when present, usually the most troublesome symptom)
- These nasal symptoms can be accompanied by ocular redness, itching & discharge.

Pathophysiology

- The initial reaction occurs when airborne allergens enter the nose during inhalation and are processed by lymphocytes, which produce antigen-specific IgE (sensitization).
- On nasal reexposure, IgE bound to mast cells interacts with airborne allergens, triggering release of inflammatory mediators.
- An immediate reaction occurs within minutes, resulting in the rapid release of preformed mediators and newly generated mediators from the arachidonic acid cascade.

- **Seasonal allergic rhinitis (SAR)** is attributed to inhaled allergens (aeroallergens) that have a seasonal variation.
- These allergens are usually encountered outdoors and are most often grass, tree or weed pollens and substances from molds and fungi.
- **Perennial allergic rhinitis (PAR)** is attributed to aeroallergens that are present in the pt's environment almost continuously throughout the year and are usually encountered indoors.
- Common perennial allergens are the house dust mite, indoor molds and fungi, insects (especially cockroaches), and pets.

- Some pts are affected year round, but have seasonal exacerbations.
- These people are probably allergic to both seasonal and perennial aeroallergens.
- Other pts have only episodic manifestations.
- These people are probably allergic to aeroallergens that are only episodically encountered.

Clinical Presentation

- Clear rhinorrhea, sneezing, nasal congestion, allergic conjunctivitis, and pruritic eyes, ears, or nose
- Periorbital swelling
- Pts may complain of loss of smell or taste
- Cough or hoarseness
- Untreated rhinitis symptoms may lead to insomnia, malaise, fatigue, and poor work or school efficiency
- Dark circles under the eyes (**allergic shiners**), a transverse nasal crease caused by repeated rubbing of the nose
- Edematous nasal turbinates coated with clear secretions
- Recurrent & chronic sinusitis and epistaxis are complications of allergic rhinitis.



Treatment

- The goals of treatment of are to
 - minimize the frequency and severity of symptoms
 - prevent comorbid disorders and complications
 - improve the pt's quality of life
 - improve work attendance and productivity and/or school attendance and performance
 - minimize adverse effects of therapy

Allergen Avoidance

- Pollens, house dust mites, molds, animal dander, and cockroaches.
- Reduce exposure to irritants (e.g., tobacco smoke, indoor or outdoor pollutants).

Pharmacologic Therapy

- Several classes of medications are available
- Choices should be based on
 - safety
 - efficacy
 - cost-effectiveness
 - adherence
 - severity
 - comorbidity, and pt preferences
- Can be administered orally, topically, or systemically and medications may be used on a regular schedule or an as needed basis.

Antihistamines

- Very effective for the sneezing, itching, and rhinorrhea.
- They also diminish eye symptoms, but have minimal effects on nasal congestion.
- Intranasal administration is more effective than oral administration for the nasal congestion, but less effective for the ocular symptoms.
- The onset of action by oral administration is usually within 1 to 2 hours, and for intranasal administration within 15 minutes.

- Two major categories: nonselective (FGA or sedating antihistamines) and selective (SGA or nonsedating antihistamines).
- FGA
 - Diphenhydramine
 - Chlorpheniramine
- SGA
 - Cetirizine
 - Levocetirizine
 - Loratadine
 - Desloratadine
 - Fexofenadine
- Both azelastine and olopatadine are considered second-generation agents, although they also have antiinflammatory effects.

- Symptom relief is caused in part by anticholinergic properties, which are responsible for the drying effect that reduces nasal, salivary, and lacrimal gland hypersecretion.
- Antihistamines antagonize capillary permeability and itching.
- Drowsiness is the most frequent side effect, and it can interfere with driving ability or adequate functioning at the workplace.
- Sedative effects can be beneficial in pts who have difficulty sleeping.

- Anticholinergic (drying) effects contribute to efficacy, adverse effects such as dry mouth, urinary retention, constipation.
- Should be used with caution in pts predisposed to urinary retention & in those with increased IOP, hyperthyroidism & CVD.
- Other side effects include anorexia, nausea, vomiting, and epigastric distress.
- Taking medication with meals or a full glass of water may prevent gastrointestinal side effects.
- More effective when taken approximately 1 to 2 hrs before anticipated exposure to the offending allergen.

Decongestants

- Sympathomimetic agents that act on adrenergic receptors in the nasal mucosa to produce vasoconstriction and shrink swollen mucosa.
- Useful only for nasal congestion
- This results from their α_1 -adrenergic agonist activity which causes vasoconstriction in the nasal mucosa.
- They provide no benefit for the sneezing, itching, rhinorrhea, or the ocular manifestations.
- Work well in combination with antihistamines.
- Topical decongestants are applied directly to nasal mucosa via drops or sprays. They result in little or no systemic absorption.
- Other adverse effects: burning, sneezing, and dryness of the nasal mucosa.

- Pseudoephedrine is an oral decongestant that has a slower onset of action than topical agents but may last longer and cause less local irritation.
- Despite the usual good tolerance of recommended doses of oral decongestants, caution is warranted when they are used in patients with cardiac disease (dysrhythmias, angina pectoris, heart failure), hypertension, cerebrovascular disease, bladder outlet obstruction (including BPH), glaucoma (especially closed angle), hyperthyroidism, and possibly diabetes.
- Use of combination oral products containing a decongestant and antihistamine is rational because of the different MOA.

- Intranasal agents: phenylephrine, xylomethazoline, oxymetazoline, and naphazoline.
- Intranasal application of decongestants provides rapid and effective relief of nasal congestion.
- May provide relief for nasal congestion, even for those pts already on intranasal corticosteroids.
- However, the continuous use of intranasal decongestants often causes a paradoxical rebound phenomenon of persistent nasal congestion, called **rhinitis medicamentosa**.
- The best applications of decongestants in AR are short-term use to overcome severe nasal congestion and to facilitate improved efficacy of other intranasal agents.
- The intranasal administration of decongestants should usually not exceed 3 consecutive days.

Nasal Corticosteroids (beclomethasone, fluticasone, budesonide, mometasone, triamcinolone, ciclesonide)

- Intranasal corticosteroids provide very good relief for sneezing, itching, and rhinorrhea, and even nasal congestion and ocular symptoms.
- They are first-line agents for severe manifestations and are also used for those with moderate disease not controlled with oral and/or intranasal antihistamines.
- Side effects: nasal burning, irritation, dryness, mild epistaxis & rare infections with *Candida albicans*.
- Some pts improve within a few days, but peak response may require 2 to 3 wks.
- The dosage may be reduced once a response is achieved.
- Blocked nasal passages should be cleared with a decongestant before administration of glucocorticoids to ensure adequate penetration of the spray.

Cromolyn Sodium

- Cromolyn sodium, a mast cell stabilizer, is available as a nasal spray for symptomatic prevention and treatment of allergic rhinitis.
- It prevents antigen-triggered mast cell degranulation and release of mediators, including histamine.
- It is moderately effective, but less so than both intranasal corticosteroids and oral or intranasal antihistamines.
- Its effects begin within 4 to 7 days of use but may not be maximal for up to 2 weeks.
- The most common side effect is local irritation (sneezing and nasal stinging).

Leukotriene Receptor Antagonist (LTRA)

- Montelukast is the only LTRA approved for Rx of AR.
- The onset of action of montelukast is delayed for a day or more.
- The drug is usually considered to be very well tolerated.
- However, there are case reports of neuropsychiatric events, including sleep disturbances, depression and suicidal ideation, as well as headache, GI disturbances, skin rash
- It is administered once daily, considered safe (FDA Pregnancy Category B and indicated for children as young as 6 months of age), and particularly well suited to those patients who also have asthma.

Antimuscarinic Agent

- Ipratropium is currently the only antimuscarinic agent indicated for Rx of AR.
- Systemic absorption is minimal.
- It is available as an intranasal spray.
- Its use is limited to those patients whose rhinorrhea has not been controlled by other therapy (antihistamines and/or INCSs).
- The 0.03% product is approved for AR in children as young as 6 years of age.
- This agent may be particularly helpful for patients who have vasomotor (idiopathic, autonomic) rhinitis, or those who may have a mixed etiology.
- Local side effects are usually limited to nasal and oral dryness, throat irritation, and mild epistaxis.

Saline

- Nasal administration of saline is an alternative for treatment of AR.
- This therapy may benefit any patient with rhinitis, including those with vasomotor rhinitis.
- Saline may be administered as drops or a spray, irrigation.
- Although less effective than intranasal corticosteroids, it has been shown to improve sneezing and nasal congestion.
- It can be used either alone or as add-on therapy.
- Iodized salt is not recommended as it may be irritating.
- Hypertonic saline seems to have no advantage over 0.9% sodium chloride.
- Side effects are usually limited to minor local nasal irritation, but nausea has been reported.