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Allergic Rhinitis in India: A Brief Overview

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Abstract

In today's society, keeping pace with urbanization, one severe problem which has been gradually augmented among people, especially the children, is allergic rhinitis, alternatively called 'Hay fever'. It is a type of nasal inflammation which occurs when the immune system shows hypersensitivity to aerial allergens. It is the most frequent type of allergy worldwide. It is different from non-allergic rhinitis only in the fact that in the latter there is no involvement of immune system, and, therefore, no allergic manifestations. The commonest causative agents of allergic rhinitis are pollens, pet hairs, dust mites, molds etc. These act as potent allergens, with which the IgE antibodies interact, causing the release of inflammatory chemicals such as histamines from basophils and mast cells. Due to these chemicals, allergic manifestations appear. Some external factors can worsen the condition further, such as cigarette smoke, cold temperature, air pollution, hairspray, perfumes etc., all of which are almost inevitable parts of today's life. The typical symptoms are running nose with itching sensation (Rhinorrhoea), sore-throat, itchy and watery eyes, frequent headaches, excessive fatigue etc. Children are generally more affected than the adults. Onset of allergic rhinitis can either be seasonal or perennial. There are also cases of local allergic rhinitis, where allergic reactions occur only in the nasal region, without affecting the other systems. The systemic type, definitely which is more problematic, can be diagnosed by skin patch testing or blood tests for detection of IgE antibodies in serum. When someone is affected, some medications are available, such as antihistamines and corticosteroids, but these have their own side effects. Unfortunately, allergic rhinitis cannot be prevented completely. We can only achieve a partial prevention by proper management of our own surroundings; avoiding the potent allergens as far as practicable, thus assuring our children to live a better quality life.

Keywords: Hay fever, allergen, IgE antibody, histamines, Rhinorrhoea

Introduction

Allergy occurs when a person's immune system reacts to substances in the environment that are harmless for most people. These substances are known as allergens and are found in dust mites, pets, pollen, insects, ticks, moulds, foods and some medicines. The genetic tendency to develop allergic diseases is called atopy. People with atopy are said to be atopic. When atopic people are exposed to allergens they can develop an immune reaction that leads to allergic inflammation (redness and swelling).

This can then cause symptoms in the:

- Nose and/or eyes-hay fever (allergic rhinitis/conjunctivitis)
- Skin-eczema, hives (urticaria)
- Lungs-asthma

A substance that is an allergen for one person may not be for another-everyone reacts differently. The likelihood (or risk) of developing allergies is increased if other family members suffer from allergy or asthma.

When a person who is allergic to a particular allergen comes into contact with it, an allergic reaction occurs. This begins when the allergen enters the body, triggering an antibody response, specifically the IgE. The antibodies attach

themselves to special cells, called mast cells. When the allergen comes into contact with the antibodies, the mast cells respond by releasing certain substances, one of which is called histamine. When the release of histamine is due to an allergen, the resulting swelling and inflammation is extremely irritating and uncomfortable.

There are different types and forms of allergic manifestations known to us. Among these, a very common but comparatively neglected allergic disease is allergic rhinitis.

Allergic Rhinitis is a symptomatic disorder of the nose induced after allergen exposure due to an IgE-mediated inflammation of membranes lining the nose. It is clinically defined as a symptomatic condition with four major symptoms as anterior or posterior rhinorrhoea, sneezing, nasal itching & nasal congestion. Allergic Rhinitis symptoms result in sleep disturbance, fatigue, depressed mood and cognitive function compromise that impairs quality of life and productivity. There may be associated conjunctivitis, postnasal drip, Eustachian tube dysfunction, otitis media, sinusitis & in children, dental malocclusions & facial deformities also. Triggers of Allergic rhinitis are domestic allergens as mites, domestic animals, insects or of plant origin; common outdoor allergens include pollens and moulds; occupational triggers as latex; tobacco smoke;

automobile exhaust include ozone, oxides of nitrogen and sulphur dioxide; aspirin and other non-steroidal anti-inflammatory drugs.

It can also be associated with co-morbid conditions as Asthma, Atopic Dermatitis & Nasal polyps. Allergic rhinitis is a global health problem also with considerable economic & societal burdens.

Types

Allergic rhinitis may be seasonal or perennial. Seasonal allergic rhinitis occurs in particular during pollen seasons. It does not usually develop until after 6 years of age. Perennial allergic rhinitis occurs throughout the year. This type of allergic rhinitis is commonly seen in younger children.

The recent classification of allergic rhinitis as suggested by ARIA (Allergic Rhinitis and its Impact on Asthma) guidelines is on the basis of:

- i). Duration as “intermittent” or “persistent” disease,
- ii). Severity of symptoms and quality of life as “mild” or “moderate-severe”.

Patients with intermittent AR have sneezing, eye symptoms and watery secretions; while patients with persistent AR have seromucous secretions, postnasal drip, smell disturbances, nasal obstruction and may be associated with asthma and chronic sinusitis.

Allergic rhinitis can also be local, when the allergic reaction is confined to the nose only, without affecting the systems.

ALLERGIC RHINITIS

Allergic rhinitis, also known as hay fever, is a type of inflammation in the nose which occurs when the immune system overreacts to allergens in the air.

Symptoms:

Eye

- Redness of eye
- Dark circle under eyes

Throat

- Post nasal drip
- Irritation in throat

General

- Body ache
- Malaise
- Low grade fever

Nose

- 10–20 sneezes at a time
- Nasal obstruction
- Profuse watery discharge
- Itching in nose, eyes, palate
- loss of sense of smell

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CAUSES	DIET & REGIMEN	TREATMENT	MEDICINES
<ul style="list-style-type: none"> Pollens from trees Dust mites Grasses and Cockroaches and Mold Weeds Dander from animals Genetic Predisposition 	<ul style="list-style-type: none"> Eat healthy diet Wear a mask Avoid exposure to irritants Exercise regularly Avoid food colours Avoid food that you have allergic 	<ul style="list-style-type: none"> Antibiotics Antacids Antihistamines Nasal decongestants Surgery if need 	<ul style="list-style-type: none"> Arsenic alba. Sabadilla Natrum Muriaticum Tuberculinum Sulphur

Fig 1: Allergic Rhinitis

Major Causes

In addition to tree pollen, other common allergens include grass pollen, dust mites, animal dander, cat saliva, mold etc. Some external factors can trigger or worsen this condition, such as cigarette smoke, certain chemicals, cold temperatures, humidity, wind, air pollution, hairspray, perfumes, wood smoke, and fumes.

Signs and Symptoms: The nose is separated into two passages by a wall of cartilage called the septum and is lined with a membrane that produces mucus. The mucus, a thin clear liquid, traps small particles and bacteria that are drawn into the nose as a person breathes. The trapped bacteria usually remain harmless in healthy individuals. Normally, a cycle of congestion and decongestion occurs continuously throughout the day. When one side of the nose is congested, air passes through the open, or decongested, side. Allergic rhinitis is a soreness or irritation of the mucous membranes that line the nose. Common symptoms include sneezing; a stuffy or runny nose; itchy eyes, nose and throat; and watery eyes. People may also have a nasal voice; breathe noisily; snore; feel chronically tired; have a poor appetite; feel

nauseated; have frequent headaches; and, have some difficulty hearing and smelling.

Complications and Side Effects: Unfortunately, allergic rhinitis itself can't be prevented. Treatment and management are keys to achieving a good quality of life with allergies. Some complications that can arise from hay fever include:

- Inability to sleep from symptoms keeping you up at night
- Development or worsening of asthma symptoms
- Frequent ear infections
- Sinusitis or frequent sinus infections
- Absences from school or work because of reduced productivity
- Frequent headaches

Antihistamine drugs are one of the major medicinal remedies to cure allergic rhinitis. Complications can also arise from antihistamine side effects. Most commonly, drowsiness can occur. Other side effects include headache, anxiety, and insomnia. In rare cases, antihistamines can cause gastrointestinal, urinary, and circulatory effects.

Allergic Rhinitis and Asthma Coexistence

Asthma is a chronic inflammatory disorder of the airways that results in reversible airway obstruction and bronchial hyper responsiveness to various stimuli; causing symptoms of wheezing, breathlessness, chest tightness, and coughing. A survey by All India Co-ordinated Project on Aeroallergens and human health, New Delhi, 2000, showed that 20–30% of the population suffers from allergic rhinitis and that 15% develop asthma. Studies have shown that not treating allergic rhinitis leads to increased asthma costs and hospitalization. Early and aggressive management of Allergic Rhinitis can prevent the development of asthma.

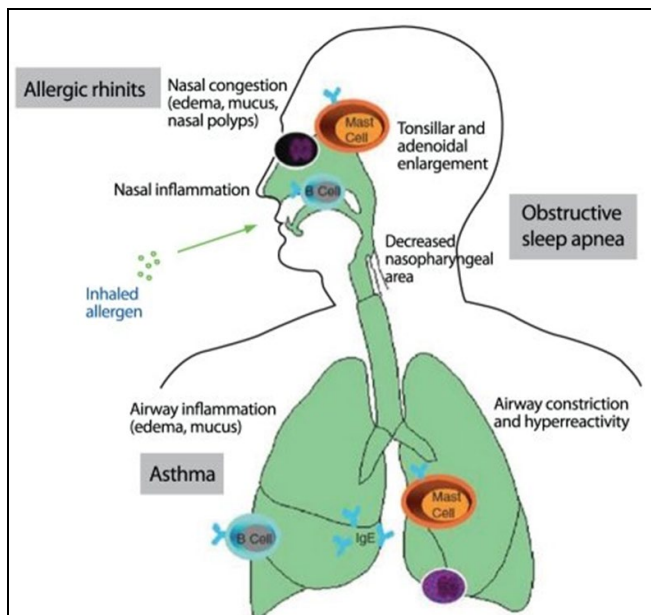


Fig 2: Allergic Rhinitis and Asthma Coexistence

Allergic Rhinitis in Children

Children can develop allergic rhinitis too, and it typically appears before the age of 10. If children develop cold-like symptoms at the same time each year, they probably have seasonal allergic rhinitis.

The symptoms in children are similar to those in adults. Children usually develop watery, bloodshot eyes, which is called allergic conjunctivitis. If wheezing or shortness of breath is also noticed in addition to other symptoms, the child may have also developed asthma.



Fig 3: Allergy Symptoms

Prevention and Cure

It is always said that ‘prevention is better than the cure’. Occurrence of allergic rhinitis can be prevented to a mention worthy extent, by taking the following preventive measures:

The most effective method one can use to prevent a reaction is to avoid the allergen that triggers his/her allergic response.

- Although it's best not to have pets when someone has allergic rhinitis, washing their pet once a week and keeping it out of the bedroom and off the furniture will help.
- To put pillows and mattresses in sealed plastic covers that keep out dust mites
- To wash sheets in hot water every week.
- To keep windows closed, so that there will not be so many pollens and molds in the house
- Wearing a mask when cleaning the house
- To not keep indoor plants at home
- To sleep with the head of bed elevated to relieve nasal congestion
- To maintain good health by exercising daily, eating balanced food and avoiding pollutants
- To stop smoking
- To move out decorative pillows, books, and stuffed animals

Following medicinal remedies are used to treat allergies:

Antihistamines

Antihistamines are the most common medicines to treat allergies. They work by stopping the body from making histamine.

Some popular antihistamines include:

- Fexofenadine (Allegra)
- Diphenhydramine (Benadryl)
- Desloratadine (Clarinex)
- Loratadine (Claritin)
- Levocetirizine (Xyzal)
- Cetirizine (Zyrtec)

Decongestants

Decongestants can be used over a short period, usually no longer than three days, to relieve a stuffy nose and sinus pressure. Popular decongestants include:

- Oxymetazoline (Afrin nasal spray)
- Pseudoephedrine (Sudafed)
- Phenylephrine (Sudafed PE)
- Cetirizine with pseudoephedrine (Zyrtec-D)

If one has an abnormal heart rhythm, heart disease, history of stroke, anxiety, a sleep disorder, high blood pressure, or bladder issues, he or she must consult the doctor before using a decongestant.

Eye Drops and Nasal Sprays

Eye drops and nasal sprays can help relieve itchiness and other allergy-related symptoms for a short time. Like decongestants, overusing certain eye drops and nose drops can also cause a rebound effect.

Corticosteroids can help with inflammation and immune responses. These do not cause a rebound effect. Steroid nasal sprays are commonly recommended as a long-term, useful way to manage allergy symptoms.

Immunotherapy

Doctor may recommend immunotherapy, or allergy shots, if one has severe allergies. It can be used in conjunction with medications to control the symptoms. These shots decrease the patient's immune response to particular allergens over time. They do require a long-term commitment to a treatment plan.

An allergy shot regimen begins with a buildup phase. During this phase, Patient goes to the doctor for a shot one to three times per week for about three to six months to let his or her body gets used to the allergen in the shot.

During the maintenance phase the frequency of the shots increase for shots every two to four weeks over the course of three to five years. Once one reaches this point, it's possible that his or her allergy symptoms will fade or disappear altogether.

Sublingual Immunotherapy (SLIT)

SLIT involves placing a tablet containing a mixture of several allergens under your tongue. It works similarly to allergy shots but without an injection. Currently, it is effective for treating rhinitis and asthma allergies caused by grass, tree pollen, cat dander, dust mites, and ragweed. Like allergy shots, the medication is taken frequently over a period of time determined by the doctor.

Possible side effects include itching in the mouth or ear and throat irritation. In rare cases, SLIT treatments can cause anaphylaxis.

Home Remedies

Home remedies will depend on the type of allergens. If one has seasonal or pollen allergies, he or she can try using an air conditioner instead of opening the windows. If possible, a filter designed for allergies can be added.

Using a dehumidifier or a high-efficiency particulate air (HEPA) filter can help to control allergies while indoors. If one is allergic to dust mites, washing his or her sheets and blankets in hot water that's above 130°F (54.4°C) proves useful. Adding a HEPA filter to vacuum and vacuuming weekly may also help. Limiting carpet in home can also be useful.

Alternative and Complementary Medicine

Due to concerns over possible side effects, more people with allergies are looking at ways to address hay fever symptoms "naturally." However, it is important to remember that any medication can have side effects, even if it's considered natural. Aside from home remedies, options can also include alternative and complementary medicine. The downside to these treatments can be that there's little supporting evidence to prove that they're safe or effective. The correct dosing may also be difficult to determine or achieve.

According to the National Center for Complementary and Integrative Health (NCCIH), some of the treatments below may be helpful in managing seasonal allergies, but more research is still needed.

- Acupuncture
- Nasal saline irrigation
- Butterbur supplements
- Honey (choose raw, organic varieties)
- Probiotics

Diagnosis

Allergy testing may reveal the specific allergens to which an individual is sensitive. Skin testing is the most common method of allergy testing. This may include a patch test to determine if a particular substance is causing the rhinitis, or an intradermal, scratch, or other test. Less commonly, the suspected allergen is dissolved and dropped onto the lower eyelid as a means of testing for allergies. Usually, a small red bump appears if the patient is allergic to a substance.

Even if a person has negative skin-prick, intradermal and blood tests for allergies, he/she may still have allergic rhinitis, from a local allergy in the nose. This is called local allergic rhinitis. Specialized testing is necessary to diagnose local allergic rhinitis.

A blood test, or radioallergosorbent test (RAST), is also common. The RAST measures the amount of immunoglobulin E antibodies to particular allergens in blood.

Epidemiology

- It typically presents at a younger age and more common in boys. Seasonal rhinitis is more prevalent among children, but adults are more affected by perennial rhinitis.
- Around one fifth of individuals with rhinitis develop asthma in their later life. Individuals sensitized with perennial allergens (dust mite) are more prone to develop asthma than individuals having sensitization with seasonal allergens (pollen grains).
- Genetic predisposition to atopy may be a factor deciding susceptibility to develop allergic rhinitis or asthma.
- Individuals having severe, persistent AR are more susceptible to develop asthma.
- Firstborn children; a serum total IgE higher than 100 IU/ml before the age of 6 years; higher socioeconomic class; air pollution; exposure to moisture damage among farmers; tobacco smoke; obesity; aspirin; RSV (respiratory syncytial virus) infection are some other risk factors for these atopic diseases.

Pathophysiology

Allergic rhinitis is characterized by an inflammatory infiltrate made up of different cells. This cellular response includes:

- Chemotaxis, selective recruitment and trans-endothelial migration of cells,
- Release of cytokines and chemokines,
- Activation and differentiation of eosinophils, T-cells, mast cells and epithelial cells,
- Prolongation of their survival,
- Release of mediators by these activated cells: among these, histamine and cysteinyl-leukotrienes (CystLT) are the major mediators,
- Communication with the immune system and the bone marrow.

In persistent allergic rhinitis patients, these inflammatory responses occur within the respiratory tract also. Neuronal stimulation in nose results into release of cholinergic neurotransmitters which contract bronchial smooth muscles. Vagal stimulation or para-sympathetic system activation also results in bronchoconstriction through substance-P and CGRP (calcitonin gene-related peptide). These mechanisms produce features of asthma.

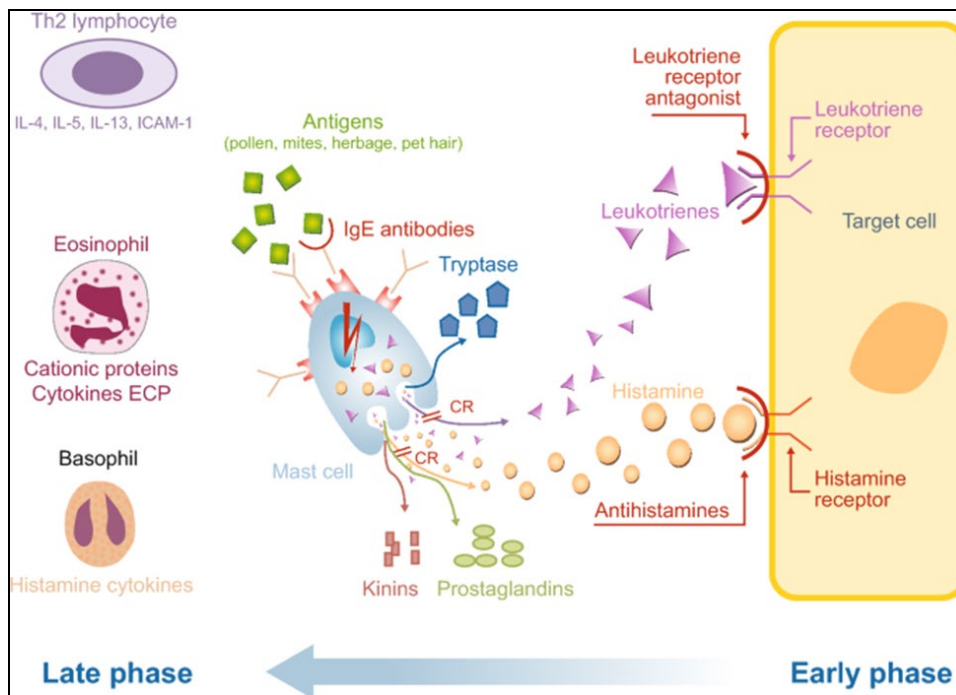


Fig 4:

Special Considerations

- i). Pregnancy-Rhinitis is often a problem during pregnancy since nasal obstruction may be aggravated by the pregnancy itself. Caution must be taken when administering any medication during pregnancy, as most medications cross the placenta.
- ii). Ageing-With ageing, various physiological changes occur in the connective tissue and vasculature of the nose predisposing to chronic rhinitis.

Allergy is a less common cause of persistent rhinitis in subjects over 65 years. Atrophic rhinitis is common and difficult to control. Rhinorrhoea can be controlled with anticholinergics. Some drugs (reserpine, guanethidine, phentolamine, methyldopa, prazosin, chlorpromazine or ACE inhibitors) can cause rhinitis. Some drugs may induce specific side effects in elderly patients.

1. Decongestants and drugs with anticholinergic activity may cause urinary retention in patients with prostatic hypertrophy,
2. Sedative drugs may have greater side effects,
3. Dexamethasone isonicotinate is the only INS linked to increased risk of bone fractures & Cushing's syndrome.
4. Paediatric Aspects-Allergic rhinitis is part of the "allergic march" during childhood. Intermittent allergic rhinitis is unusual before two years of age. Allergic rhinitis is most prevalent during school age years. The principles of treatment for children are the same as for adults, but

special care has to be taken to avoid the side effects typical in this age group. Doses of medication have to be adjusted and special considerations followed. In children, symptoms of allergic rhinitis can impair cognitive functioning and school performance, which can be further impaired by the use of sedating oral H1-antihistamines. Disodium cromoglycate is commonly used to treat allergic rhinoconjunctivitis in children because of the safety of the drug.

Indian Scenario

Allergic rhinitis is the type of allergy that affects the greatest number of people. In Western countries, between 10 and 30 percent of people are affected in a given year. It is most common between the ages of twenty and forty.

In India more than 20-30% of the population is reported to be afflicted with an allergic rhinitis. The increasing prevalence of allergic disorders in the country has been more marked in the past two decades, with almost one in two people exhibiting an allergic response to some common environmental factor.

Growing industrialisation and fast changing biodiversity coupled with sedentary lifestyles are causing a surge in allergic diseases, especially among children in the country, the World Allergy Organisation (WAO) has warned.

Currently, about 20 to 30 per cent of people in India are having one or more allergic diseases and their prevalence is raising dramatically, the WAO said.

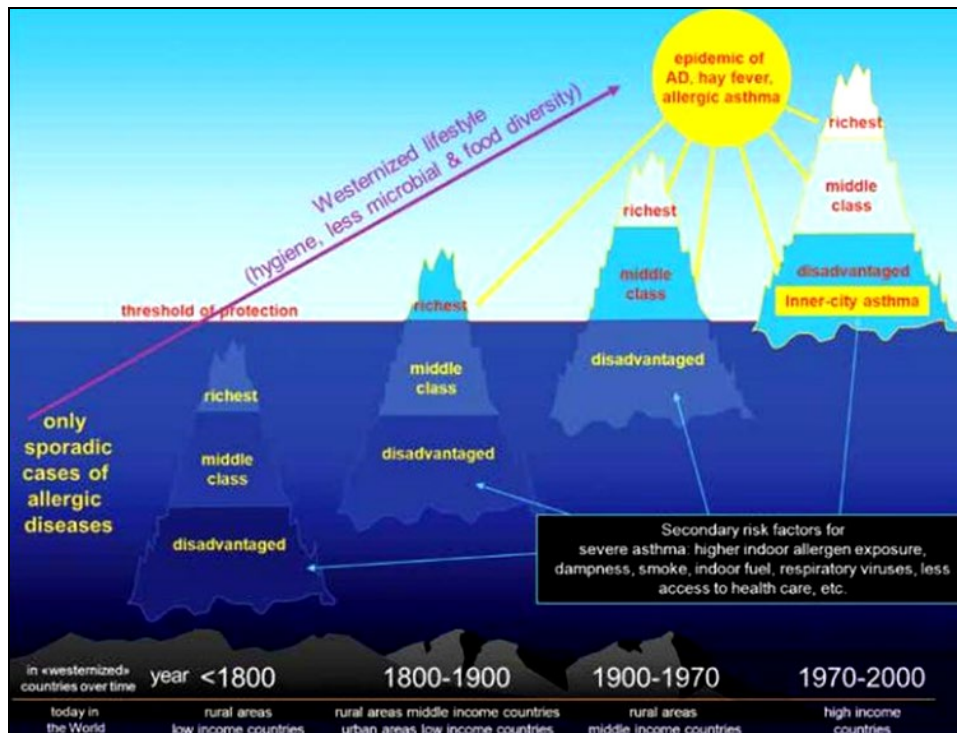


Fig 5:

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