

# ALLERGIC RHINITIS IN CHILDREN

*Allergic rhinitis is the most common chronic disorder affecting children.*

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There are good data suggesting that the prevalence of allergic rhinitis is increasing in South African children.<sup>1</sup> The prevalence has increased from 30.4% to 38.5% between 1995 and 2002. No single reason explains this increase, and there may be a multitude of reasons.

Allergic rhinitis is often trivialised because it is not associated with any significant mortality or morbidity. This may be true in the context of South Africa, where we face major challenges such as AIDS, TB and malnutrition. However, allergic rhinitis significantly affects the quality of life of patients. It affects children in the form of learning problems and is also associated with co-morbidities such as sinusitis, otitis media, worsening of asthma and allergic conjunctivitis.

## Definition

The old classification of allergic rhinitis which divided it into two types, i.e. seasonal and perennial allergic rhinitis, has now been replaced by a new classification adopted by the World Health Organization (Fig. 1). It is based on the frequency and severity of symptoms.

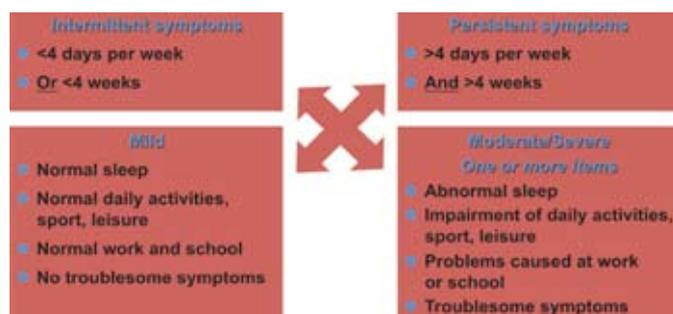


Fig. 1. Revised classification of rhinitis by the World Health Organization.<sup>2</sup>

## Symptoms and signs of allergic rhinitis

Children with allergic rhinitis present with sneezing, rhinorrhoea, nasal obstruction and an itchy nose. Most patients with allergic rhinitis will also have ocular symptoms with red and itchy eyes often associated with a yellow discharge. Many of these patients will have allergic facies which may include allergic shiners, facial pallor, a nasal crease and the allergic salute (Fig. 2). Younger children may also present with snoring and disturbed sleep patterns. In untreated children allergic rhinitis may cause 'long face syndrome' with associated orthodontic problems caused by prolonged mouth breathing. Examination of the nose reveals marked oedema of the inferior turbinates, and a clear watery nasal discharge, which sometimes turns yellow (Fig. 3).

***Allergic rhinitis is also associated with co-morbidities such as sinusitis, otitis media, worsening of asthma and allergic conjunctivitis.***

A significant number of children with allergic rhinitis experience co-morbid conditions such as otitis media, infective sinusitis, uncontrolled asthma, allergic conjunctivitis, learning problems at school and sleep

disturbances. These co-morbid conditions must be actively looked for since they are often under-diagnosed and untreated. A detailed environmental history must also be taken.

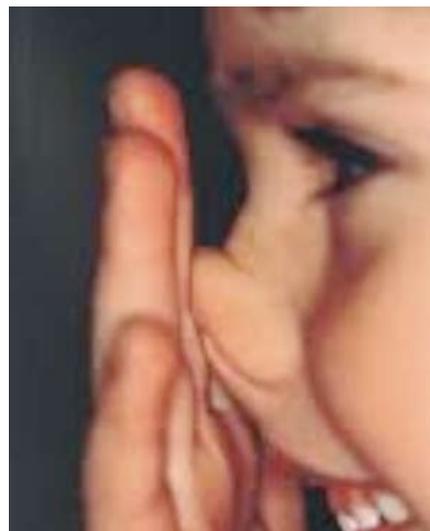


Fig. 2. Typical allergic salute.



Fig. 3. Marked oedema and swelling of the inferior turbinates.

## Investigations

The diagnosis of allergic rhinitis is based on a good history, clinical examination and appropriate investigations. It is absolutely essential that allergy testing is done in patients with suspected allergic rhinitis since conditions such as adenoidal hypertrophy, foreign body in the nose, chronic infective sinusitis and nasal polyps may mimic the signs and symptoms of allergic rhinitis.

The skin-prick test is the allergy test of choice in patients with suspected inhalant allergy (Fig. 4). It is safe, inexpensive, sensitive and very specific. The test may have to be differed in patients who are on oral antihistamines. It cannot be done in patients with extensive atopic eczema or dermatographism. In these patients a RAST test can be done. The RAST test is an *in vitro* test that is sensitive, specific but expensive.

## Allergic rhinitis



Fig. 4. Skin-prick test.

Requesting large panels of inhalant allergens for RAST testing is inappropriate. The request for individual allergens on RAST testing must be based on the patient's indoor and outdoor environment as well the prevalent allergens in the patient's geographical area. This is why it is important to take a detailed environmental history.

Other tests that may be used to confirm allergy are Hansel's staining of nasal secretions, demonstration of eosinophilia on a full blood count or a Phadiatop test, which is a screening test for fourteen inhalant allergens. These tests are very nonspecific and not helpful in precisely diagnosing a specific allergy.

### Management of allergic rhinitis

The management of allergic rhinitis involves a combination of environmental therapy, pharmacotherapy and immunotherapy.

#### Allergen avoidance

Aero-allergens in the different geographical areas of South Africa are listed in Table I.

**Most patients with allergic rhinitis will also have ocular symptoms with red and itchy eyes often associated with a yellow discharge.**

Environmental control should be based on the results of the allergy test. This must not be arbitrarily done. There is good evidence that avoidance of allergens resolves symptoms of allergic rhinitis. The problem is that allergen avoidance is very difficult to implement. There have been a number of trials of house dust mite avoidance measures and their effect on allergic rhinitis.<sup>3</sup> The results have been disappointing. The problem is that avoidance measures do not completely eliminate allergen exposure. However, when a single avoidable allergen is removed from the patient's environment, e.g. cat allergen, a significant reduction in

**Table I. Aero-allergens in different geographical areas of South Africa**

All regions of South Africa	House dust mites, Bermuda grass, perennial rye grass, mould allergens
Western Cape	Add: oak and plane tree pollen, <i>Blomia tropicalis</i> , <i>Eficaciium</i> fungal spores
Gauteng	Add: tree pollen (cypress)
Farming areas	Add: <i>Zea mays</i> , horse, <i>Blomia tropicalis</i>

symptoms may be experienced. In practice this may prove to be very difficult.

#### Pharmacotherapy

There are different classes of medications used to treat allergic rhinitis. These are:

- intranasal steroids (INS)

- oral antihistamines
- intranasal antihistamines
- intranasal decongestants
- intranasal chromones
- anticholinergics
- leukotriene receptor antagonists.



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Reference: 1. IMS Data, June 2010. Marketed by Aspen Pharmacare. Building 12, Healthcare Park, Woodlands Drive, Woodmead, 2191. www.aspenpharma.com Medical Information Hotline: 0800 118 000



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Table II. Effect of medications on symptoms of allergic rhinitis

Symptoms	Sneezing	Rhinorrhoea	Nasal obstruction	Itching	Ocular symptoms
Intranasal steroids	+++	+++	+++	+++	++
Oral antihistamines	+++	+++	—	+++	+
Intranasal antihistamines	+	+	—	+	—
Intranasal decongestants	—	—	+++	—	—
Anticholinergics	—	+++	—	—	—
Leukotriene receptor antagonists	+	+	++	?	++

The effects of these medications are listed in Table II.

### Intranasal steroids

This is the most effective form of treatment available to treat allergic rhinitis.<sup>4</sup> They have potent anti-inflammatory effects and therefore

have a significant effect on nasal obstruction, sneezing, rhinorrhoea, itching and ocular symptoms. There are many different types of intranasal steroids available in South Africa. These are beclomethasone dipropionate (Beclate), budesonide (Rhino-cort, Budeflam), triamcinolone (Nasacor), fluticasone dipropionate (Flixonase, Flo-mist), mometasone (Nasonex) and fluticasone furoate (Avamys). They all have very similar effects on nasal symptoms, but mometasone and fluticasone furoate have significant effects on ocular symptoms as well. Beclomethasone dipropionate should be avoided in children because of its potential to cause growth stunting. This side-effect has not been seen with the other INS. Generally INS have a very favourable safety profile, only occasionally causing epistaxis. They work very fast and provide symptom relief within a few hours. The dosages of INS are listed in Table III.

*A significant number of children with allergic rhinitis experience co-morbid conditions such as otitis media, infective sinusitis, uncontrolled asthma, allergic conjunctivitis, learning problems at school and sleep disturbances.*

### Oral antihistamines

Antihistamines are generally classed as sedating or non-sedating. The classic or first-generation antihistamines also have anticholinergic and antiserotonin effects. They also cross the blood-brain barrier. These characteristics are responsible for their considerable side-effects. First-generation antihistamines are primarily over-the-counter preparations and are included in many combination products for cough, colds and allergies. They are often found in



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**Table III. Dosages of intranasal steroids****Beclomethasone (Beconase, Beclate)**

<6 years: Not established  
 6 - 11 years: 1 - 2 sprays/nostril bid  
 ≥12 years: administer as in adults

**Budesonide (Rhinocort, Budeflam)**

4 - 11 years: 1 spray/nostril once daily; may increase to 2 sprays/nostril once daily if needed  
 ≥12 years: administer as in adults

**Fluticasone propionate (Flixonase, Flomist)**

<4 years: not established  
 ≥4 years: 1 spray/nostril once daily; may increase to 2 sprays/nostril if needed

**Fluticasone furoate (Avamys)**

<2 years: not established  
 2 - 11 years: 55 µg intranasally qd (i.e. 1 spray each nostril daily)  
 ≥12 years: administer as in adults

**Mometasone (Nasonex, Nexomist)**

<2 years: not established  
 2 - 11 years: 1 spray (50 µg/spray) each nostril once daily  
 ≥12 years: administer as in adults

**Triamcinolone (Nasacort AQ)**

<4 years: not established  
 6 - 11 years: Nasacort AQ: 1 - 2 sprays/nostril/day; titrate to lowest effect dose  
 ≥12 years: administer as in adults

**Table IV. Antihistamines and dosages****Cetirizine (Zyrtec)**

Available as a syrup (5 mg/5 ml) and 10 mg tablets  
 6 - 12 months: 2.5 mg po od; not to exceed 2.5 mg/d  
 12 - 24 months: 2.5 mg po qod; may increase to 2.5 mg po bid, if needed  
 2 - 5 years: 2.5 - 5 mg po od or divided bid; not to exceed 5 mg/d  
 ≥6 years: 5 - 10 mg po od or divided bid

**Levocetirizine (Xyzal)**

An active enantiomer of cetirizine  
 Available as a 5 mg breakable (scored) tablet  
 <6 years: not established  
 6 - 11 years: 2.5 mg (half tab) po od in evening  
 ≥12 years: administer as in adults

**Loratadine (Clarityne)**

Available as syrup (5 mg/5 ml) and tablets (10 mg)  
 <2 years: not established  
 2 - 5 years: 5 mg po qd  
 ≥6 years: administer as in adults

**Desloratadine (Deselex)**

Major metabolite of loratadine which, after ingestion, is extensively metabolised to active metabolite 3-hydroxydesloratadine. Relieves nasal congestion as well.  
 Available as syrup (0.5 mg/ml), or tablet 5 mg  
 6 - 11 months: 1 mg (2 ml syrup) po od  
 1 - 5 years: 1.25 mg (2.5 ml syrup) po od  
 6 - 11 years: 2.5 mg po od  
 ≥12 years: administer as in adults

**Fexofenadine (Telfast)**

Available in 120 mg and 180 mg tablets  
 <6 years: not established  
 6 - 11 years: 30 mg po od  
 ≥12 years: administer as in adults

combination with oral decongestants. These include brompheniramine (Dimetapp), chlorpheniramine (Allergex), and diphenhydramine (Benalyn). The first-generation antihistamines should not be used in children because of their sedating effects and other side-effects.

Second-generation antihistamines are loratadine (Clarityne), desloratadine (Dese-

lex), fexofenadine (Telfast), levocetirizine dihydrochloride (Xyzal) and cetirizine (Zyrtec). These are safe to use in children (5 - 6 years). They selectively inhibit peripheral histamine H<sub>1</sub> receptors and therefore do not cause sedation.

Antihistamines are very effective treatments for allergic rhinitis and have very good effects on rhinorrhoea, sneezing and itching. Some

of the newer generation (Desloratadine) antihistamines may also reduce nasal obstruction. Table IV lists the antihistamines and their dosages.

**Intranasal antihistamines**

There is only one intranasal antihistamine available in South Africa (Azalestine). These are not as effective as intranasal steroids and have very weak anti-inflammatory effects and are therefore not very effective in treating the symptoms of allergic rhinitis.

*The skin-prick test is the allergy test of choice in patients with suspected inhalant allergy.*

**Intranasal decongestants**

These are oxymetazoline hydrochloride (Drixine, Iliadin). They are available as drops or nasal sprays. They are very potent agents that work by causing potent vasoconstriction of the vessels of the turbinates. They are extremely effective against nasal obstruction; however their effects are short lasting, causing a rebound phenomenon. There may be a tendency to abuse them. Prolonged use can cause rhinitis medicamentosa. They should therefore be used for very short periods only (maximum period 5 days at a time).

**Intranasal cromones (rhinocrome)**

These are very weak anti-inflammatory drugs and are not currently available in South Africa.

They need to be used frequently and are not very effective in resolving most of the troublesome symptoms of allergic rhinitis.

*It is absolutely essential that allergy testing is done in patients with suspected allergic rhinitis since conditions such as adenoidal hypertrophy, foreign body in the nose, chronic infective sinusitis and nasal polyps may mimic the signs and symptoms of allergic rhinitis.*

**Intranasal anticholinergics (ipratropium bromide)**

These are not available in South Africa in nasal formulation. However, the MDI can be attached to a nasal adapter and used as a nasal spray. This may cause slight burning when used intranasally. They are very effective and relieve nasal secretions but are very short acting. They work primarily in some types of vasomotor rhinitis.

### Leukotriene receptor antagonists (montelukast)

This class of drugs has anti-inflammatory effects on the lung as well as the nose and can be very effective in treating the upper and lower airways simultaneously. However, there have been many studies examining the effects of leukotriene receptor antagonists on allergic rhinitis in children. These studies showed that although montelukast was better than placebo in controlling the symptoms of allergic rhinitis, antihistamines were significantly more effective than montelukast.<sup>7</sup>

*Avoidance measures do not completely eliminate allergen exposure.*

### Immunotherapy

Allergen immunotherapy is an effective adjunct for the treatment of allergic rhinitis.<sup>8</sup> It has an immunomodulatory effect and therefore offers the possibility of a significant alteration of the natural history of allergic rhinitis. There are two types of allergen

immunotherapy available, i.e. subcutaneous (SCIT) or sublingual (SLIT). Both these types of immunotherapy have been found to be effective in patients who are monosensitive to house dust mites or grass pollens.

### Summary

Allergic rhinitis is a growing problem in South African children. It is under-diagnosed and under-treated. It causes significant

impairment of the quality of life of patients. There are many very effective treatments available which can completely control the symptoms of allergic rhinitis. Patients must be well educated about the disease and the correct use of the medication to ensure compliance.

References available at [www.cmej.org.za](http://www.cmej.org.za)

## IN A NUTSHELL

- Allergic rhinitis is often trivialised because it is not associated with any significant mortality or morbidity.
- Allergic rhinitis is also associated with co-morbidities such as sinusitis, otitis media, worsening of asthma and allergic conjunctivitis.
- The diagnosis of allergic rhinitis is based on a good history, clinical examination and appropriate investigations.
- The management of allergic rhinitis involves a combination of environmental therapy, pharmacotherapy and immunotherapy.
- The first-generation antihistamines should not be used in children because of their sedating effects and other side-effects.
- There are many very effective treatments available that can completely control the symptoms of allergic rhinitis.

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