



Allergic rhinitis mimics and therapeutic options

Allergic rhinitis, a common chronic condition affecting predominantly children and young adults, is associated with sinusitis, lethargy and behavioural changes, particularly in young children. Recent advances in allergen immunotherapy may allow for earlier intervention to alter the natural history of allergic rhinitis.



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Allergic rhinitis is a common condition and is increasing in prevalence. Allergic rhinitis and conjunctivitis are estimated to affect about one in 16 children aged 6 to 7 years, one in 10 children aged 13 to 14 years and one in five adults worldwide, but are rare in infants.^{1,2} Once established, symptoms generally persist for at least 10 years, and often longer.^{3,4} The reasons behind the

evidence of increased prevalence in Australia, the UK and Europe are as yet unexplained.

Typical symptoms

The typical complaints of a person with allergic rhinitis are a nose that is both blocked and runny with clear mucus (i.e. nasal obstruction and rhinorrhoea), an itchy nose, sneezing and a cough

IN SUMMARY

- Asthma and allergic rhinitis frequently coexist, and treatment of allergic rhinitis can improve asthma control.
- Not all snuffly noses are due to allergy. Several conditions may mimic the symptoms of allergic rhinitis and should be considered in the differential diagnosis.
- Snuffly noses in infants are more commonly due to infection than allergy, are only occasionally due to allergy and are unrelated to dietary factors, even if coexistent food allergy is present.
- Allergy testing can help identify triggers to facilitate allergen avoidance and help design specific immunotherapy.
- The options for management of allergic rhinitis are the identification and avoidance of allergic triggers and medication to control symptoms but only specific allergen immunotherapy has the capacity to alter the natural history of disease.

from postnasal drip (the latter symptom can sometimes be mistaken for an asthma cough). Allergic rhinitis may masquerade as a continuous or recurrent respiratory infection (particularly in children) and as frequent sore throats from nocturnal mouth breathing, and may be complicated by frequent episodes of sinusitis and, in young children, otitis media.

Allergic conjunctivitis is usually accompanied by allergic rhinitis, with red and itchy eyes, and is sometimes complicated by infective conjunctivitis due to frequent rubbing.

Seasonal symptoms of allergic rhinitis and conjunctivitis are most commonly triggered by pollen exposure, whereas symptoms that are present all year round are due to exposure to house dust mite, mould spores or indoor pets. In northern Australia, however, pollens may occur intermittently throughout the year, particularly after rain. It is important to note that inflammation of the upper airways is caused by exposure to inhaled allergen and not by dietary factors. Because asthma and allergic rhinitis frequently coexist, a search for asthma symptoms should always be made in a patient with allergic rhinitis, and the condition treated if present.⁵ (See the box on this page for a discussion of united airways disease.)

Classification

Traditional classifications have divided patients with allergic rhinitis into two broad groups:

- those with seasonal allergic rhinitis, whose symptoms are triggered by, for example, pollen allergen
- those with perennial allergic rhinitis, whose symptoms are triggered by, for example, dust mite.

More recent classifications divide allergic rhinitis into intermittent and persistent, based on the frequency of symptoms rather than the timing of occurrence.⁶

Comorbidity

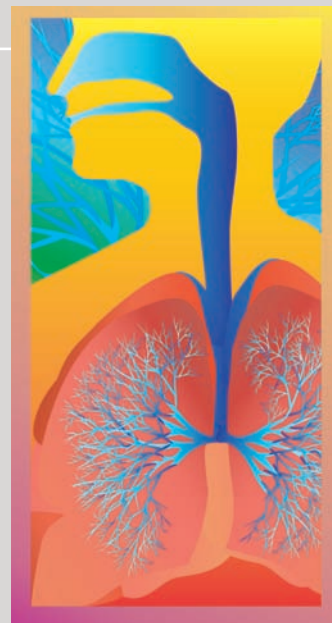
Comorbidity is common in patients with allergic rhinitis. Untreated allergic rhinitis is associated with increased risk of sinusitis and otitis media (the latter in young children rather than in adults), more difficult to control asthma, sleep disturbance and worsening of underlying sleep apnoea. Lethargy, poor concentration and behavioural

United airways disease

Allergic rhinitis and asthma both result from a systemic inflammatory response to inhaled allergen that involves the upper and lower airways and the production by the bone marrow of pro-inflammatory cytokines. The cytokines promote the production of inflammatory cells that track to both upper and lower airways. The term 'united airways disease' refers to allergic rhinitis and asthma being upper and lower respiratory tract manifestations, respectively, of the same inflammatory disease process.⁵ Inhalation of allergen via one end organ provokes inflammation in the other.

Around 80% of people with asthma also have rhinitis, and around 25% of people with allergic rhinitis have asthma.

In some, asthma may be the dominant presenting complaint, whereas in others asthma may be silent or subclinical, sometimes manifesting as complaints of lack of fitness or exercise-related complaints. Because asthma and allergic rhinitis frequently coexist, a search for asthma symptoms should always be made in a patient with allergic rhinitis, and treated if present. Treatment of allergic rhinitis has been shown to improve asthma control and reduce the risk of hospitalisation due to asthma exacerbation.



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changes may arise as a result of persistent symptoms and poor quality sleep, and may impact on learning in young children. Lethargy may be aggravated by the use of sedating (as opposed to the more expensive non-sedating) antihistamines as a cost-saving measure.

Observational studies have linked chronic mouth breathing to structural changes of the face. Nasal obstruction due to allergic rhinitis or adenoid hypertrophy (the so-called 'adenoid facies') has been associated with a long and narrow face, long narrow tongue, high arched palate, small lower jaw and dentition problems such as overbite, crossbite, dental crowding and malocclusion. These structural changes are not always reversible with treatment.

Oral allergy syndrome

Some patients allergic to grass or tree pollen complain that uncooked vegetables or fresh fruits

Table 1. Differential diagnoses of allergic rhinitis**Common**

- Anatomical abnormalities such as deviated septum, nasal polyps, foreign bodies (in children)
- Chronic sinusitis
- Vasomotor rhinitis
- Dryness of the nasal mucosa (e.g. age, dry climates, medication, Sjögren's syndrome)
- Rhinitis medicamentosa

Uncommon

- Atrophic rhinitis
- Sarcoidosis
- Malignancy
- Drug-induced rhinitis (e.g. anti-hypertensives, oral contraceptive pill, NSAIDs)
- Vasculitis
- Hormonal (e.g. hypothyroidism, pregnancy)
- CSF rhinorrhoea (e.g. unilateral nasal drip)

(and sometimes nuts) trigger itching and swelling of the mouth. The mechanism is considered to relate to cross-reactive allergic responses to allergens present in pollen and some foods. Cooking usually destroys the allergen, allowing the food to be tolerated. Occasionally, more serious allergic reactions can occur, particularly if the patient exercises soon after eating a large quantity of the food to which they are allergic.

A similar mechanism is likely to operate in some dust mite-allergic patients sensitised to tropomyosin, some of whom may develop similar symptoms with ingestion of crustaceans.

Conditions mimicking allergic rhinitis symptoms

Not all snuffly noses are allergic. Several conditions may mimic the symptoms of allergic rhinitis and should be considered

It's my sinus, doc!

Blocked sinuses commonly trigger a pressure sensation over the face that is worse when leaning forward and sometimes associated with painful upper teeth. Symptoms are usually correlated with the severity of nasal congestion.

However, blocked sinuses are not always the cause of these symptoms, and sometimes it pays to think laterally.

- Bruxism (tooth grinding/clenching) is often associated with pain around the angle of the jaw and facial pain, often independent of the nose and often worse in the morning.
- Migraines are commonly mistaken for 'sinus' trouble. Symptoms are independent of the nose, can radiate behind the eyes and be associated with nausea and photophobia. Because some antihistamines are very useful migraine preventer drugs, pain may respond to allergy treatment.
- A little appreciated problem called middle turbinate syndrome (whereby the middle turbinate of the nose presses on the septum) can result in nerve-derived central facial pain that correlates with the severity of nasal congestion and may respond to surgical treatment.

in the differential diagnosis (Table 1).

Overuse of decongestant sprays can cause rebound nasal congestion (rhinitis medicamentosa), which worsens rhinitis and increases the risk of infection. An impaired sense of smell is strongly suggestive of chronic infection and/or nasal polyps. A dry nose is common in elderly patients, in those with Sjögren's syndrome and in dry climates, and also occurs with the use of some medications (e.g. some antihistamines, diuretics and older antidepressants). Additionally, patients complaining of 'sinus' should be asked about their symptoms to reduce the use of unnecessary antibiotics or radiological investigations (see the box on this page).

History and investigation

The presence of atopic eczema or asthma in a patient makes it more likely that his or her rhinitis has an allergic origin. The history may be useful in identifying allergic triggers but diagnostic testing increases the accuracy of diagnosis. Identification of allergic triggers allows attempts to be made at reducing allergen exposure and provides targets for specific immunotherapy. Blood testing to measure allergen-specific IgE to dust

mite, animal danders, pollen mixes and mould mixes is an alternative to skin prick testing. Although this blood testing is commonly known as 'RAST' (radioallergen sorbent) testing, in reality more accurate nonradioactive methods are now generally used.

Food-specific IgE testing should not be performed for the investigation of rhinitis because false and irrelevant low positive results may arise. A full blood count or total IgE measurement is of little diagnostic utility.

The nasal mucosa of a patient with allergic rhinitis typically has a pale pink-blue colouration, in contrast to the bright red colour of infection or vasomotor rhinitis (Figure).

Management principles

The principles of management in a patient with allergic rhinitis are:⁷

- identification of allergic triggers
- attempts to minimise allergen exposure
- use of medication
- specific allergen immunotherapy.

Patient education is an essential part of management. Specialist referral may be indicated in more complex cases. The efficacies of the various therapies used

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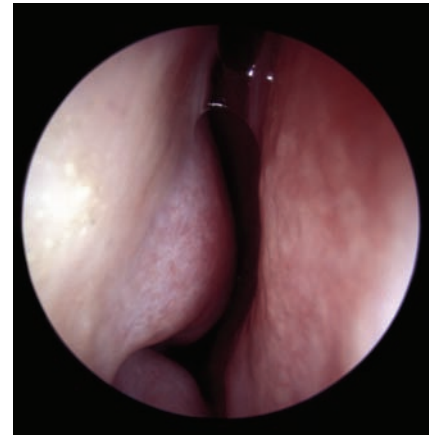
Table 2. Efficacy of therapy for allergic rhinitis*

Therapy	Level of evidence [†]	Size of benefit
Allergen avoidance	Controversial	+/-
Oral antihistamines	Level I	++
Oral leukotriene receptor antagonists	Level I	+
Intranasal chromones	Level I	+
Intranasal antihistamines	Level I	+
Intranasal anticholinergics	Level II	+
Intranasal corticosteroids	Level I	+++
Allergen-specific immunotherapy	Level I	++

* Adapted with permission from Rimmer J, Ruhno JW. 6: Rhinitis and asthma: united airway disease. *Med J Aust* 2006; 185: 565-571. © 2006; The Medical Journal of Australia.

[†] Based on National Health and Medical Research Council levels of evidence.

KEY: - = no effect; +++ = the most effective.



PHOTOLIBRARY

Figure. The typical pale pink–blue colouration of the nasal mucosa in a patient with allergic rhinitis.

who may swap no or marginal improvements in rhinitis for increased risk of osteoporosis. The milk–mucus myth is discussed in the box on page 46.^{11,12}

Allergen exposure minimisation

Minimisation of exposure to allergens is often advised for patients with allergic rhinitis. Although its benefit is controversial, some patients may find partial relief.

Medication

The mainstay of treatment for most patients with allergic rhinitis is medication. Intranasal corticosteroids are the most effective and cost-effective medication but require regular use and take a few days to be effective. Oral antihistamines are generally less effective at reducing symptoms but have the benefit of flexibility of occasional use in patients with intermittent symptoms. Medications can be used in combination. The same medicines are used in adults and children, although nasal sprays are less child-friendly.

Intranasal corticosteroids

The intranasal corticosteroids used for allergic rhinitis are the same as those used for asthma treatment, albeit at lower doses. They include beclomethasone,

Complementary/alternative and nondrug treatments for allergic rhinitis

Most people affected by allergic rhinitis are young and dislike the idea of ongoing medication. They often consider instead complementary and alternative medicine therapies and nondrug treatments. However, with complementary and alternative medicine therapies, popularity does not equate with effectiveness. Considered alternatives to ongoing medication for the treatment of allergic rhinitis include:

- steam inhalations and saline – these can soothe the nose and assist sinus drainage
- horseradish, garlic and vitamin C – these are popular but lack evidence of benefit⁸
- homeopathic remedies – these are popular but lack evidence of benefit⁹
- echinacea – regardless of the controversies surrounding evidence of benefit for treating infection, there are no studies demonstrating benefit from taking echinacea-containing products, and most adverse effects reported are in atopic patients¹⁰
- diet manipulation – benefit from diet manipulation is anecdotal and lacks an evidence base; if such therapy is attempted, it should be short term and supervised to prevent adverse nutritional consequences^{11,12}
- acupuncture – there is conflicting evidence of benefit from acupuncture in a recent systematic review¹³
- herbal medications – research is ongoing.⁸

for allergic rhinitis are given in Table 2 and the management of patients with the condition is summarised in Table 3.

Complementary and alternative medicines are popular for allergic rhinitis but evidence of benefit is for the most part

lacking although research is ongoing (see the box on this page).⁸⁻¹³ The use of dietary manipulation (i.e. restriction of wheat or dairy products) has the potential for serious nutritional consequences in young children and also in older adults,

Table 3. Managing allergic rhinitis

- Determine whether symptoms are intermittent or persistent
- Assess severity and impact on quality of life
- Identify avoidable triggers with allergy testing
- Look for comorbidities such as eczema, food allergy and asthma, and treat if indicated
- Educate patients (or their parents) on the nature of allergic rhinoconjunctivitis and options for symptom control, including allergen avoidance, medication and immunotherapy
- Avoid overdiagnosis of food allergies and discourage unnecessary dietary restrictions, which are almost always ineffective for controlling rhinitis
- Antihistamines and nasal corticosteroid sprays are the mainstay of therapy when allergen avoidance is ineffective or not possible
- Consider specific allergen immunotherapy in patients with significant symptoms
- Allergen immunotherapy is the only treatment with the potential to alter the natural history of allergic rhinitis and conjunctivitis

budesonide, fluticasone, mometasone and triamcinolone. Patients should be educated about the correct technique to use with nasal sprays (Figures 2a and b).

There is no evidence that intranasal corticosteroids used in modest doses stunt growth or have systemic side effects unless they are used in conjunction with high-dose inhaled asthma corticosteroids or oral corticosteroids. Unless burning and significant bleeding occurs, they do not need to be stopped every few weeks or months unless adverse reactions occur.

The milk-mucus myth

Some people complain that when they eat dairy products, their throat feels coated and mucus is thicker and harder to swallow. This short-lived sensation is not due to allergy but is related to the texture of the fluid and occurs with liquids of similar viscosity. Formal studies have shown that no changes occur in mucus production and lung capacity after milk exposure.^{11,12} Although restricting dairy products is popular in patients with allergic rhinitis, there are important nutritional consequences of doing so, particular in young children.

There are no published articles in peer-reviewed medical journals and no blinded trials showing any evidence of benefit regarding allergic rhinitis or asthma from restricting dairy products. There is, however, much evidence to the contrary.

Antihistamines

When antihistamines are used, the newer relatively nondrowsy antihistamines are recommended because of the sedative effects of the older antihistamines, which can impair driving ability and concentration even when sedation is not perceived. Of the oral antihistamines used for allergic rhinitis, cetirizine, desloratadine, fexofenadine, levocetirizine and loratadine are considered less sedating than dexchlorpheniramine, diphenhydramine, pheniramine or promethazine. Azelastine and levocabastine are intranasal antihistamine sprays used topically to treat allergic rhinitis.

Azelastine, levocabastine and ketotifen are available as eye drops for the treatment of allergic conjunctivitis.

Other medications

Other drugs used in the symptomatic treatment of patients with allergic rhinitis include the oral leukotriene receptor antagonist montelukast, the intranasal chromone sodium cromoglycate and the intranasal anticholinergic agent ipratropium.

It is important to note that some over-the-counter medications for the relief of runny noses contain herbal remedies such as echinacea and andrographis, and that allergic reactions, including anaphylaxis, have been described to these particular remedies. The risk appears to be higher in atopic patients.

Specific allergen immunotherapy

Allergen immunotherapy should be contemplated in those patients who have significant symptoms of allergic rhinitis or conjunctivitis, when allergic triggers are difficult or impossible to avoid and as an alternative to medication that is ineffective, causes side effects or is disliked by the patient. It has been found to be effective at reducing the severity of allergic rhinitis and conjunctivitis and to have a beneficial impact on asthma severity. For patients with allergic rhinitis and conjunctivitis, it is the only treatment that addresses the underlying immune process and can alter the natural history of the disease; also, it is the closest thing to 'natural therapy'.

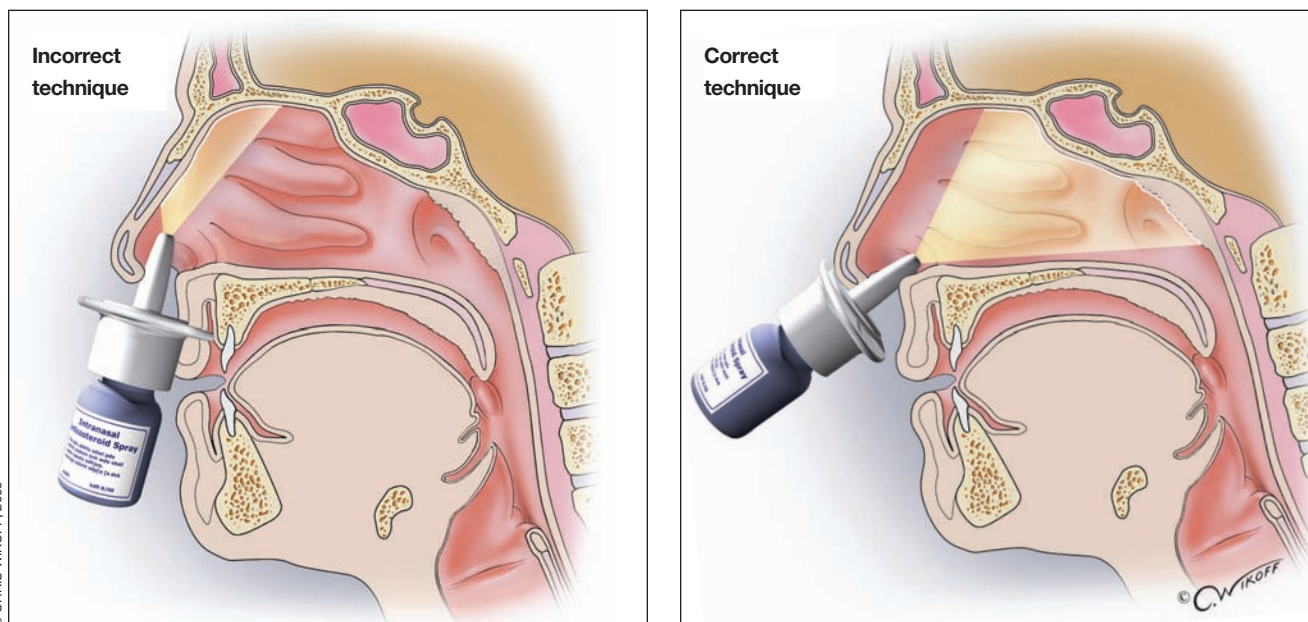
Treatment involves administration of increasingly larger amounts of commercial allergen extracts with the aim of inducing tolerance to allergens with natural exposure.

Specialist referral

Specialist referral may be indicated when the diagnosis is uncertain or patients fail to respond to treatment. It is generally recommended when immunotherapy is contemplated (Table 4).

Recent advances in allergen immunotherapy

Injection of allergen has been the traditional method of choice in allergen immunotherapy for several decades,



Figures 2a and b. a (left). Patients instinctively insert an intranasal corticosteroid spray almost upright. This treats a small area only and is unlikely to benefit the patient. b (right). A greater dose is delivered to where the site of action is needed if the spray bottle is positioned as shown. The spray should be administered with the head tilted down slightly; the patient should dab the nose if any medication runs out the front, rather than sniff.

Table 4. Specialist referral for allergic rhinitis

- When the diagnosis is in doubt
- When allergic triggers cannot be identified
- When symptoms are severe, difficult to control with standard therapy or there is significant comorbidity
- When immunotherapy is contemplated

but recent research has demonstrated the efficacy of high dose sublingual/oral immunotherapy. This has opened up this form of treatment to young children who might otherwise not have been able to tolerate treatment by traditional methods and to adults who are unable to sustain regular visits to supervise treatment.

Both oral and injectable immunotherapies have been shown to have benefit over placebo, to have sustained benefit

after therapy is ceased and to be cost-effective compared with ongoing medication over many years.¹⁵⁻¹⁷ Both methods have relative advantages and disadvantages in terms of cost, safety, convenience and patient acceptability. However, whether one form of therapy is more effective than the other in the long term is unclear.

As with any form of treatment, appropriate allergen and patient selection is essential, and specialist assessment is generally recommended if allergen immunotherapy is being contemplated. Both injectable and oral immunotherapies are widely used in Australia.

Allergen costs are approximately \$25 to \$30 per month per allergen extract for injectable immunotherapy, and about twice that amount for oral immunotherapy, depending on the protocols used to purchase the extracts used for oral immunotherapy. Although the upfront costs are expensive in the short term, it is not difficult for patients with severe

allergic rhinitis to spend \$50 to \$80 each month on medications to treat the symptoms of rhinitis.

Management during pregnancy and breastfeeding

The risk of medications during pregnancy should always be balanced against disease severity and likely benefit. Topical therapy with intranasal saline, chromones or budesonide, however, is considered to be relatively safe (Category A; no known risk in pregnancy). Oral medications pose a higher theoretical risk, although some are listed as Category A, specifically dexchlorpheniramine.

Allergen immunotherapy is not normally commenced during pregnancy or when it is being contemplated in the near future. This is not because of any teratogenic risk but rather in case a significant adverse allergic reaction occurs after administration, in which case two people would be potentially affected. Although the risk of serious allergic reactions

decreases once the maintenance dose is reached, the risk does not reduce to zero. There is no reason for immunotherapy to be avoided during breastfeeding. Decisions to cease or continue established immunotherapy should be discussed with the specialist prescribing the treatment.

Conclusion

Allergic rhinitis is a chronic disease of childhood and adult life in which morbidity can be severe and the financial burden of treatment rests largely on patients and their carers. Many patients have multiple coexistent disorders, each requiring specific interventions including prescribed or nonprescribed medications or treatments. The genetic clustering of allergic disease often results in multiple individuals within the same family being similarly affected.

The costs of symptomatic treatments are significant in patients who require them on a daily basis for substantial proportions of the year. Such medication may be less cost-effective in the long term than interventions such as immunotherapy, the only form of treatment shown to alter the natural history of disease. Unfortunately, allergy medications remain unsubsidised under the Pharmaceutical Benefits Scheme, do not count towards the Medicare Safety Net and are rebated by some private health funds only under certain conditions.

The Australasian Society of Clinical Immunology and Allergy has several useful publications, including an allergic rhinitis diagnostic and management 'checklist' for patients and a document for GPs titled *Is It Allergy?*^{18,19} **MT**

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Online CPD Journal Program



Rhinorrhoea and sneezing are typical symptoms of allergic rhinitis. List two more symptoms of the condition.

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