

# Allergic rhinitis in children: management guidelines

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*The current article is supported by a medline and medscape literature search and review of the Cochrane library and controlled trials register using the terms rhinitis, allergic and paediatric.*

## Introduction

Symptoms of rhinorrhoea, nasal obstruction, mouth breathing, hyponasal speech and snoring are common in children and often occur as a result of recurrent upper respiratory tract infections, adenoidal hypertrophy and/or allergic rhinitis. Because all three conditions, and their overlapping symptoms and signs are common, and may co-exist, clear differentiation can be difficult. This is compounded by the fact that in children there are occasions when a clear and consistent history cannot be elicited. Children themselves often seem unconcerned by their symptoms while they can be a source of great concern to their parents.

Allergic rhinitis may be classified as either intermittent (seasonal) or persistent (perennial) depending on the duration of symptoms. The overall prevalence of allergic rhinitis in children is approximately 10–25% with this condition representing the most common chronic illness in childhood. The prevalence of intermittent symptoms in the paediatric population ranges from 8–13%.<sup>1,2</sup>

The two most common differential diagnoses are those of adenoidal hypertrophy and recurrent upper respiratory tract infections (URTI) particularly under the age of 7 to 10 years.<sup>3</sup> Because of the spontaneous resolution of symptoms in these conditions a conservative approach with an explanation to the parents of the cause and likely resolution in due course will often be all that is required. Simple measures such as teaching nose-blowing to remove mucus that will otherwise become stagnant and become locally infected with discoloration within the nasal vestibule may help. Adenoidectomy should rarely be necessary as should antibiotics for chronic nasal discharge secondary to URITs. Antibiotics given for discharge will often only give short-term relief and if they are given this should be with the expectation that their symptoms will recur with the next upper respiratory tract infection. The purulent mucus seen in the nasal vestibule in young children, particularly under 4 years old, is often simply the result of colonization of stagnant secretions by local commensals rather than true bacterial infection involving the paranasal

sinuses. If this discoloured mucus is sucked out (which causes a lot of noise and may upset the child and is not routinely recommended) there is often clear uninfected mucus seen within the nasal cavity and beyond.

The epithelial lining of the respiratory tract is a continuum and if one area is involved it is often not in isolation. Approximately 20% of children with allergic rhinitis have lower respiratory tract hyper-reactivity or asthma, and at least 70% of asthmatics have coexisting rhinitis. The treatment of allergic rhinitis may improve coexisting asthma<sup>4</sup> that appears not to be simply related to steroid absorption.

## History

Children aged between 2 to 5 year have on average 8 upper respiratory tract infections a year<sup>5,6</sup> that produce nasal obstruction and clear rhinorrhoea, which then becomes mucopurulent before settling spontaneously in approximately 10 days. In children aged 1–3 years symptoms may persist for more than 15 days.<sup>7</sup> If parents report an episodic history with symptom-free intervals then this implies the child has recurrent URITs rather than a persistent allergic rhinitis or marked adenoid hypertrophy.

When a parent has allergic rhinitis the likelihood that any offspring will is 50% increasing to 72% when both parents are affected.<sup>8</sup> In the U.K. most intermittent allergies are associated with tree and grass pollens while persistent allergies are most commonly associated with Der p1, animal salivary proteins, and moulds. Sneezing bouts, itchy eyes and a family history make a diagnosis of allergic rhinitis more probable. Most parents will be aware of intermittent allergic rhinitis, but fewer will be aware that persistent symptoms can be due to allergy and that this condition can develop at any age although this is rarer over 60 years.<sup>9</sup>

Adenoidal hypertrophy may give rise to symptoms that are similar to persistent allergic rhinitis without the symptoms of sneezing or itchy eyes. A trial of regular nasal steroids for at least 6 weeks in persistent rhinitis may be of both diagnostic and therapeutic benefit although compliance is

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particularly poor under 6 years. The postnasal space increases relative to the rest of the upper respiratory tract about the age of 7 years.

If snoring is a major symptom it is important to ask about symptoms of possible obstructive sleep apnoea. If the child regularly stops breathing for more than 6 seconds when they have no respiratory tract infection and it ends with an abrupt grunting noise or gasp, or if they are a restless sleeper adopting unusual sleeping positions, then further investigation to exclude sleep apnoea is indicated. Parents will often fail to volunteer this information unless directly questioned but are often relieved when these symptoms are asked about.

### Examination

Examination may confirm the presence of nasal obstruction or discharge. The quality of the speech gives an indication whether they have a hyponasal voice. Allergic shiners and allergic creases are unreliable in confirming the diagnosis of allergic rhinitis. The turbinate's colour is said to be pale or congested in allergic rhinitis but this is also an unreliable sign.

The post-nasal space can be examined using an angled mirror but this can be difficult in young children. Nasal endoscopy is commonly employed in adults but is difficult to in children under 6 years old.

### Investigations

A lateral soft tissue radiograph is a relatively reliable means of assessing adenoid size<sup>10,11</sup> but as it rarely influences the management in most children it is rarely done.

Skin prick tests can be performed in children from 4 years of age depending on their temperament. This involves minimal discomfort and it should be superficial enough not to cause any bleeding. It has good sensitivity but only moderately good specificity. It helps confirm the diagnosis, allows advice on allergen avoidance and graphically demonstrates to the patient and parents the nature of the problem.<sup>12</sup> In children who are taking antihistamines, have eczema or dermatographism, an alternative is specific IgE serology although this is a far less sensitive test. While these tests give supportive information they should not be used in isolation.<sup>13</sup>

### Treatment

- allergen avoidance
- topical nasal treatment
- systemic therapy : antihistamines, oral steroids
- immunotherapy
- surgery.

### Allergen avoidance

There is some evidence that minimizing exposure to aggravating allergens, especially house dust mite,<sup>14</sup> is helpful where it is the sole responsible allergen. In children with persistent allergic rhinitis secondary to Der p1 allergen avoidance, primarily using mattress, pillow and duvet cover, has been advocated<sup>15</sup> although other measures including removing soft toys from the bedroom, wooden

flooring as opposed to thick carpets and vacuuming with a cleaner fitted with a HEPA filter may further reduce allergen exposure. Acaricide sprays will reduce the HDM population<sup>16</sup> in thick piled carpets and soft furnishings.

Discussion about the possibility of an allergy to family pets has to be approached with a degree of care. Patients will often conclude that their pet cannot be the offending cause as they have had it well before onset of their symptoms but skin tests may indicate otherwise. Cat and dog allergens are potent, but limiting the animals to certain areas of the house and in particular avoiding the bedroom may improve matters. Frequent washing of dogs to reduce the allergen load can help as these allergens are very soluble. Anecdotally parents occasionally report that avoiding milk products has reduced nasal discharge although there is no evidence to support this contention in the medical literature.

### Topical nasal treatment

#### Nasal Steroids

Topical nasal steroids are effective especially for the symptoms of nasal obstruction with a demonstrable advantage over antihistamines in treating this symptom. Patients, or their relatives, need to understand that this medication needs to be taken on a regular basis to be effective. If symptoms are intermittent then it is worthwhile commencing treatment more than 2 weeks before the onset of the pollen season to gain maximum benefit. As compliance is crucial for maximum symptom control once daily preparations have an advantage.

Concerns have been expressed regarding the long-term safety of nasal steroids in children especially if being treated for concomitant asthma. Not all steroid sprays are equal in their systemic absorption and bioavailability. For example there is almost 100% absorption of budesonide delivered to the nose compared to 1.8% for fluticasone. Many children with allergic rhinitis also have asthma and will also have other inhaled corticosteroids. The Committee on the Safety of Medicines has advised that the height of children requiring long-term treatment with nasal corticosteroids is monitored regularly and if there is evidence of growth retardation referral to a paediatrician should be considered.<sup>17</sup> There is some evidence that steroids at moderate dose retard growth although it remains unclear whether this will affect final adult height.<sup>18,19</sup> A number of studies and a recent review have given some reassurance on the use of intranasal corticosteroids especially with the newer nasal steroids that have negligible absorption.<sup>20-24</sup> These observations do not negate the evidence that betamethasone causes significant adrenal suppression and should be avoided in children.<sup>25</sup> Similarly depot injectable steroids should not be used.<sup>26</sup> The side effects of topical steroids are of irritation which can be reduced by aqueous preparations<sup>27</sup> and nosebleeds which are reported in about 4% of patients taking topical nasal steroids. Nosebleeds can be reduced if the spray is applied using the left hand to the right nostril and vice versa to avoid the agent hitting the same area of the septum each time. Concerns about the effects of the vehicle

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benzalkonium chloride have been found to not have an effect *in vivo*.<sup>28</sup> Although occasional cases of septal perforation have been reported in the literature this is rare and most rhinologists do not regard this complication as a result of a topical nasal steroids on its own.

### **Topical Antihistamines**

Topical antihistamines are reported to reduce the symptoms of sneezing and rhinorrhoea in a substantial proportion of patients<sup>27</sup> although 50% found the taste of these unpleasant in one study. Systemic antihistamines are better for combating the symptoms of itching, sneezing and rhinorrhoea.<sup>28</sup> Some patients do not want to take steroids in any form either because of their potential side-effects or because of concerns regarding systemic absorption and the long-term effect this may have. Topical antihistamines may be considered in these cases and have the advantage that they may be taken on an as required basis. They do not help nasal obstruction.

### **Other topical medication**

#### **Chromones**

Sodium chromoglycate relieves allergic symptoms of itching, sneezing and rhinorrhoea but there remain problems with compliance as a result of frequent dosing schedules (4 times daily) and nasal steroids are more effective.<sup>29</sup> They are generally well tolerated although rarely used in practice as other agents are more effective and more convenient.

#### **Decongestants**

Decongestants act by vasoconstriction of the nasal mucosa. This temporarily helps nasal obstruction although they have no impact on the symptoms of sneezing and itchiness. Topical decongestants should only be used for short periods preferably no more than seven days so as to prevent rebound phenomena of increases swelling and nasal obstruction on withdrawal (rhinitis medicamentosa).

Ipratropium Bromide is an anticholinergic agent that may be of benefit if rhinorrhoea is a predominant symptom. It is not recommended in children under 12 years.

### **Systemic therapy**

#### **Antihistamines**

Antihistamines are especially useful in controlling the symptoms of sneezing, rhinorrhoea and itching eyes. The second generation of H<sub>2</sub> receptor antagonists cause less sedation than previous antihistamines as they are larger molecules and lipophobic making them unable to cross the blood brain barrier.<sup>30-33</sup> They also have less affinity for serotonergic and cholinergic receptors resulting in fewer side-effects. It is important to be aware of the range of possible interactions that can occur.

Antihistamines can be taken when required and do not need to be taken continuously but may take 1-2 hours before having their maximum effect. Cetirizine, desloratidine and loratidine are licenced in the U.K. for

children 2 years and above, levocetirizine for 6 years and above while other second generation antihistamines are not licenced for children under 12 years.

#### **Systemic Steroids**

A short course of systemic steroids can have a profound effect in relieving symptoms and can aid in gaining control of severe symptoms that can then subsequently be maintained with topical steroids. Intramuscular steroids may have a place on a one-off basis e.g. an atopic person facing an important event such as an exam at the height of the hay fever season.<sup>26</sup> However the dose is not titratable, both local and systemic side effects can occur and a similar effect can be achieved with oral steroids.

#### **Immunotherapy**

Intradermal immunotherapy for grass-pollen has recently been shown to be of long-term benefit in adults<sup>34</sup> but it is less effective when more than one allergen is involved. Its long-term benefit in children has not been assessed. The current advice is that desensitization has a role in intermittent allergic rhinitis caused by pollens unresponsive to other treatments and without co-existing asthma. Immunotherapy should not be undertaken in children under 5 years of age. The lack of studies showing a clear benefit in children over the natural resolution rate of 10%, along with the risks and inconvenience make it an unattractive option at present. Resuscitation equipment must be available because of the real risk of life-threatening anaphylaxis where this treatment is offered.

Only three studies have examined the effect of sublingual immunotherapy in children; and these showed no effect for intermittent allergic rhinitis.<sup>35-37</sup> One study using intranasal immunotherapy for persistent rhinitis to Der p1 showed significantly fewer symptoms after 2 years although their serum and nasal specific IgE and Ig G<sub>4</sub> were no different.<sup>38</sup>

#### **Surgery**

In adults studies on turbinate surgery have demonstrated short-term success. There are no paediatric studies available. While many techniques have been described a recent review concluded that no single procedure could be recommended above all others.<sup>39</sup> Based on the results of surgery in adults the effect of turbinectomy, diathermy or laser to the inferior turbinates in children is unlikely to be of benefit beyond 12-18 months after surgery.<sup>40</sup> If turbinate surgery is ever offered it is important that patients understand preoperatively that surgery is not a cure for allergic rhinitis and that symptom improvement will be temporary. If there is a contributing structural deformity such as a severe septal deviation then surgery may improve the symptom of nasal obstruction and also improve delivery of topical nasal treatments and this is best deferred until the child has stopped growing, otherwise surgery cannot be recommended in children.

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### Conclusion

The main treatments available for allergic rhinitis remain allergen avoidance in children where practicable, regular topical nasal steroids for the symptoms of nasal obstruction and/or non-sedating antihistamines for the

symptoms of itchy eyes, sneezing and rhinorrhoea. Compliance for nasal medication particularly in children under 6 years of age is poor. Nasal steroids that have minimal systemic effects should be used in children.

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