

InnovAiT: The RCGP Journal for Associates in Training

<http://ino.sagepub.com/>

Vasomotor Rhinitis

Helen Smith and Simon Glew

InnovAiT 2012 5: 401

DOI: 10.1093/innovait/ins052

The online version of this article can be found at:

<http://ino.sagepub.com/content/5/7/401>

Published by:



<http://www.sagepublications.com>

On behalf of:



Royal College of
General Practitioners

[Royal College of General Practitioners](#)

Additional services and information for *InnovAiT: The RCGP Journal for Associates in Training* can be found at:

Email Alerts: <http://ino.sagepub.com/cgi/alerts>

Subscriptions: <http://ino.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

>> [Version of Record](#) - Jul 1, 2012

[What is This?](#)

Vasomotor rhinitis

Rhinitis is characterized by nasal discharge, congestion, blockage and sneezing. These symptoms can have a variety of aetiologies, including allergic, non-allergic or infective causes. This article focuses on the diagnosis and management of patients with non-allergic non-infective rhinitis, but clearly, there are overlaps with the management of rhinitis due to other causes. Non-allergic rhinitis is very common; it is estimated to affect almost one in four adults, particularly elderly patients.

The GP curriculum and vasomotor rhinitis

The GP curriculum has several statements relevant to vasomotor rhinitis (VR) and assisting with the management of the patient's experience. **Curriculum statement 15.4: ENT and facial problems** states that GPs should be able to;

- Manage primary contact with patients who have an ear, nose and throat (ENT) or facial problem
- Utilize knowledge of the relative prevalence of ENT problems to assist diagnosis
- Demonstrate appropriate use of time as a diagnostic tool for ENT conditions
- Demonstrate effective strategies for dealing with parental concerns regarding ENT conditions
- Empower patients to adopt self-treatment and coping strategies where possible
- Demonstrate a thorough knowledge of the scientific backgrounds of symptoms, diagnosis and treatment, particularly with respect to ENT interventions of dubious efficacy

Rhinitis is included in the list of common ENT conditions for which case-based discussions may be profitable.

What is meant by vasomotor rhinitis?

Rhinitic symptoms can be due to allergy, infection or non-allergic non-infectious causes (Fig. 1). It is useful to subdivide non-allergic non-infectious rhinitis according to whether there is tissue eosinophilia. Non-allergic rhinitis is

an umbrella term for a heterogeneous group of disorders, which includes VR (see Fig. 1).

VR is the most common type within this group and is a chronic and year-round (perennial) problem for patients. Since the symptoms can be aggravated by seasonal changes in humidity and ambient temperature, they may have a relapsing–remitting pattern that may suggest an allergic rhinitis. However, rhinorrhoea is the predominant symptom

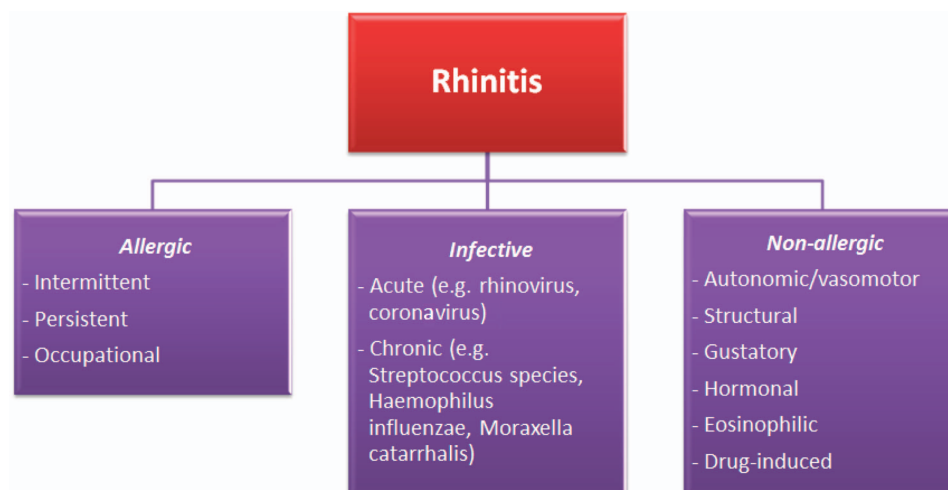


Figure 1. Classification of rhinitis.

in non-allergic rhinitis, while sneezing and conjunctival symptoms are less marked than in allergic rhinitis.

The causes of non-allergic rhinitis

The more common forms of non-allergic non-infectious allergic rhinitis seen in primary care are summarized in Table 1. While the underlying causes are diverse, the patient experiences are similar, with extremely distracting nasal symptoms that may impact on the patient’s appearance, concentration, social interactions and sleep but are often perceived as minor by health professionals.

Vasomotor rhinitis

Relatively little is understood about the aetiology of VR. It is triggered in susceptible individuals by physical and chemical agents, such as cold air, smoke and certain smells.

The nose is a highly vascular organ and acts as both a heat exchanger and a filter. Vascular tone is under autonomic control with sympathetic innervation, which drives vasoconstriction, decreased secretion and increased nasal patency. Parasympathetic innervation leads to vasodilatation, increased secretion and congestion.

Heat exchange is achieved by drawing air across vascular beds deep to the mucous membrane. When exposed to cold, these vascular beds become engorged, increasing the amount of blood flow for heat exchange and limiting airflow. When there is instability of vascular tone, venous engorgement occurs in response to relatively small changes in air temperature or humidity, leading to the clinical picture of VR.

Gustatory and food-related rhinitis

Gustatory and food-related rhinitis occur without the associated gastrointestinal, dermatological or systemic

manifestations seen in patients with food allergy. The typical symptom of food related rhinitis is copious rhinorrhoea after the ingestion of food, particularly hot and spicy foods. The response is mediated by the vagus nerve.

Non-allergic rhinitis with eosinophilia syndrome

Non-allergic rhinitis with eosinophilia syndrome (NARES) is a clinical syndrome comprising symptoms of allergic rhinitis without any allergy being demonstrable on formal testing (skin prick testing or specific IgE) but with more than 20% eosinophils on nasal cytology analysis. Anosmia is a prominent feature of NARES but is rare in allergic rhinitis.

The pathophysiology of NARES is poorly understood, but a key component is a self-perpetuating, chronic eosinophilic nasal inflammation resulting in polyps. NARES is also a risk factor for the development of aspirin/non-steroidal anti-inflammatory drug (NSAID) sensitivity and for obstructive sleep apnoea.

Differential diagnosis

Symptoms resembling rhinitis may arise from structural and mechanical factors as well as from inflammatory and immunologic factors. In adults, nasal polyps may be associated with asthma and sensitivity to aspirin/NSAIDs (known as the aspirin triad or Samter’s triad). Nasal polyps in children should raise concern about cystic fibrosis.

Differentiating between types of rhinitis

VR is often a diagnosis of exclusion. It is important to differentiate from nasal symptoms caused by allergy and to exclude any other significant pathology.

Table 1. Causes of non-allergic rhinitis

Type of rhinitis	Comment
VR	Non-allergic non-infectious rhinitis with chronic nasal symptoms that are not driven by infections or inflammatory mechanisms and are not associated with nasal eosinophilia. Caused by abnormal vascular responses.
Drug-induced rhinitis	Can be caused by several drug classes, including beta-blockers, angiotensin-converting enzyme inhibitors and aspirin/NSAIDs Recreational use of cocaine may also produce rhinitis
Hormonal rhinitis	Seen during pregnancy and puberty and in patients on hormone replacement therapy or the oral contraceptive pill. Also occurs in hypothyroidism and acromegaly.
Gustatory and food-related rhinitis	Copious watery rhinorrhoea occurring after eating, particularly with hot and spicy foods.
NARES	Patients have rhinitis with eosinophilia in nasal discharge but no allergens demonstrable. Anosmia prominent feature. Other complications include nasal polyposis and obstructive sleep apnoea.
Structural	Polyps, foreign bodies, nasal tumours and adenoidal hypertrophy

These symptoms can also be due to infection, typically with common cold viruses (e.g. rhinovirus or corona viruses) or bacteria (e.g. *Streptococcus* species, *Haemophilus influenza* or *Moraxella catarrhalis*). Where neither allergic nor infective aetiology are identified the diagnosis is termed non-allergic rhinitis, of which VR is the most common form (Fig. 1).

Do the symptoms suggest an allergic basis?

If nasal congestion, rhinorrhoea and cough (secondary to postnasal drip) are accompanied by sneezing and itchy nose, palate or throat, this is suggestive of an allergic aetiology.

To distinguish between allergic and non-allergic rhinitis, it is important to take a detailed history. Focus on the pattern and seasonality of symptoms, the duration of suffering, comorbidities, occupational exposures and patient identified precipitants. Also, document previous medication use, how it was used (regularly or as required and using what technique for nasal steroid sprays) and how effective it has been.

VR persists all year-round, is more common in middle age and tends to be worse in the mornings. A clear rhinorrhoea is usually associated with VR except following trauma or surgery where it may indicate the leak of cerebrospinal fluid.

Do the symptoms suggest an infective aetiology?

It is important to exclude an infective aetiology, where rhinorrhoea is usually green and an allergic cause, where rhinorrhoea is more often yellow.

Does physical examination have a role?

In VR, the role of examination in primary care is to exclude differential diagnoses rather than confirm VR. Examination of the anterior part of the nose (anterior rhinoscopy) using a nasal speculum allows assessment of the nasal mucous membranes, patency of nasal passages, quantity and quality of nasal discharge, presence of foreign bodies, some anatomical abnormalities and tumours.

Nasal rhinoscopy or endoscopy is required to visualize the rest of the upper respiratory tract. Referral to a specialist for these procedures should be reserved for equivocal cases or patients with 'red flag' signs and symptoms (unilateral blood stained discharge) or suspicion of tumour or systemic diseases like Wegener's granulomatosis. Cerebrospinal fluid leakage as a cause of nasal discharge is extremely rare, but if suspected, it can be confirmed by testing for beta 2 transferrin. Otoscopy may identify middle ear effusions, which could be suggestive of nasal mucosal hypertrophy, blocking the Eustachian tube orifice, a tumour of the paranasal sinus, polyps or Eustachian tube dysfunction.

Are there any useful diagnostic tests?

Because VR is a diagnosis of exclusion, testing for sensitivity to specific allergens can help exclude an allergic basis to the nasal symptoms. Skin prick testing for IgE-mediated sensitivities to common and suspected potential allergens is useful to assist in the exclusion of allergic rhinitis, but the results require careful interpretation.

Alternatively blood tests for allergen-specific IgE could be used. This test tends to be performed when skin prick testing is unavailable. The blood tests are more expensive but provide comparable results to skin prick tests.

Whether *in vivo* or *in vitro* allergy tests are used, it is important to remember that a positive result indicates sensitivity but not necessarily clinically relevant allergy. The benefit to the patient undergoing either of these investigations is mainly about saving those with non-allergic rhinitis from the financial and social costs associated with inappropriate allergen avoidance. This is discussed in greater detail in a previous *InnovAiT* article (Smith, 2012).

There is no value in measuring total serum IgE or peripheral blood eosinophil counts. These are neither sensitive nor specific for identifying either an allergic aetiology or an NARES.

Management of VR

Management should include trigger avoidance, where applicable, medication and education:

- Avoidance of triggers and precipitants—by definition, there are no allergens to be avoided but avoidance of recognized triggers and irritants can help
- Medications—the choice of medication must take into account the type of rhinitis: oral antihistamines are generally ineffective in non-allergic rhinitis and allergic immunotherapy is not relevant.

Treatment should focus on symptom control tailored to the patient's experience of the disease. A quality of life assessment should be undertaken before and after a reasonable trial period in order to assess treatment success. Despite the different aetiology, pharmacotherapy is similar to that used for allergic rhinitis.

Topical decongestants (e.g. xylometazoline) are often effective but should only be used for short periods, either to improve nasal patency prior to administering topical steroids or prior to special events such as an exam or a wedding. Otherwise, the nose tends to become tolerant of the drug, developing a rebound vascular congestion that will not respond to medication; this is called 'rhinitis medicamentosa'.

Both antihistamines and topical steroids tend to be more effective in treating allergic rhinitis than VR. Antihistamines are a first-line therapy. Second-generation antihistamines such as loratadine, desloratadine and fexofenadine are preferable to first-generation antihistamines such as chlorphenamine as they are less likely to induce sedation or cause anticholinergic side effects.

Intra-nasal antihistamines, such as azelastine, may be trialled. They have been found to be as efficacious as second-generation oral antihistamines in the treatment of seasonal allergic rhinitis. They have a rapid onset of action, within 15 minutes, and therefore tend to be used as a rescue

therapy for nasal symptoms. Unfortunately, due to systemic absorption, they are also associated with sedation.

Topical steroids are better at reducing congestion than antihistamines and should be combined with antihistamines when stepping up therapy. Intra-nasal corticosteroids (such as fluticasone, mometasone or betamethasone) can be useful at reducing symptoms of VR but are often applied incorrectly. Nasal drops tend to be applied incorrectly more often than nasal sprays and, as such, are thought to carry a greater risk of systemic side effects. Instructions for the correct use of nasal sprays and drops are illustrated in Fig. 2.

The use of any nasal steroid can lead to thinning of the nasal mucosa leading to epistaxis in around 10% of patients although there is some evidence that this can be reduced by correct technique. Patients with raised intraocular pressure should be monitored for glaucoma while using intra-nasal steroids. Patients should be warned that, although the onset of action is within 6–8 hours of application, it may take up to a fortnight before maximal effects are achieved.

If symptoms are severe or prior to a special event, a short course of oral steroids can be highly effective and should be considered in combination with a nasal corticosteroid.

Anti-leukotriene drugs (montelukast) can be effective in both allergic and non-allergic rhinitis and are particularly useful in those patients who are sensitive to aspirin.

Ipratropium bromide (Rinatec spray) is useful against watery rhinorrhoea regardless of allergic status. It should be used three times a day and, in order to be best targeted to the symptom, this should be applied within a relatively short time period over the course of the morning. Treatment of NARES consists mainly of intra-nasal corticosteroids, with the optional addition of second-generation antihistamines and/or leukotriene receptor antagonists.

Prognosis and complications

VR has a less favourable course than allergic rhinitis. Opinion is divided as to whether early diagnosis is important. Exclusion of potentially serious differential diagnoses definitely is important and good control of symptoms may reduce the likelihood of asthma development and improve quality of life.

VR tends to be persistent and complete cure is rare. As such, it is considered a chronic condition, requiring a reasonably intensive management strategy, which may not be acceptable to all patients. As with any chronic illness, patients should be prepared for lifelong management of their condition.

Complications of rhinitis include sinusitis, otitis media and the development of polyps, which can worsen symptoms by

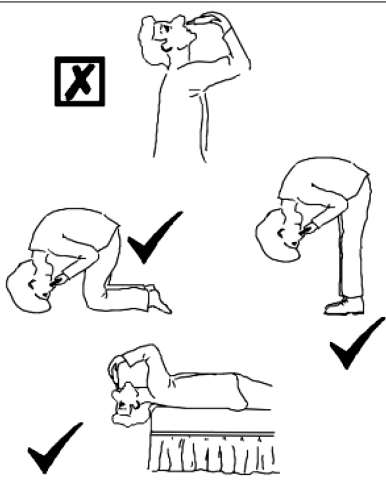
Nasal Spray	Nasal Drops
	
Blow your nose and shake the bottle Tilt head forward Hold spray bottle upright Insert tip of spray bottle just inside one nostril. Close the other nostril with your other hand and apply one or two sprays as directed Breathe in gently as you spray, do not sniff hard Repeat in other nostril	Blow your nose gently Take one of the three positions illustrated above Drop the required number of drops into each nostril Stay in position for two minutes after putting in the drops Replace lid on bottle
Illustrations reproduced with permission from Patient UK	

Figure 2. Correct techniques for administering nasal sprays and drops.

reducing nasal patency. Polyps respond poorly to intra-nasal steroids and surgical treatment is generally required.

Patient education

Patients may be concerned about long-term consequences secondary to using nasal steroids, but it is extremely rare for these medications to cause local or systemic side effects, even if used regularly for many years. Systemic absorption is minimal when using mometasone or fluticasone and modest for all other available preparations apart from dexamethasone and betamethasone, which are well absorbed systemically and should only be used for short periods. No single nasal steroid is more likely to induce epistaxis than another, but some patients are more prone to this side effect than others, in which case all nasal steroids are likely to cause trouble. It is important to provide adequate advice regarding the application of intra-nasal medication.

Focus on the chronicity of the condition and shared management. Patients may feel frustrated either by the frequency with which medications are required or with their seeming inefficacy, both of which can reduce compliance. This is even more pertinent in children.

Management in children

In children with symptoms of rhinitis, care must be taken to exclude other diagnoses. Mucociliary dysfunction may predispose to the development of rhinitis and the possibility of cystic fibrosis should be considered, especially if there are polyps. Structural malformations including cleft palate, adenoidal hypertrophy or functional problems such as laryngeal reflux may also be causative factors and should be excluded.

As in adults, if left untreated, rhinitis is associated with an increased risk of nasal polyps, sinusitis and otitis media. In addition, children are at risk of oral and facial abnormalities and behavioural problems. Parents should be made aware of these possibilities and how to recognize them.

Treatment is with nasal steroids and antihistamines as for adults. Ipratropium bromide may also be useful in managing refractory rhinorrhoea. Preference should be given to nasal steroids with a low level of systemic absorption and these should be prescribed at the lowest possible dose that provides symptom relief. Efficacy is likely to be greater if both parent and child are shown how to administer nasal medication. In children, this is with the child laying flat with head tilted backwards. If treatment is prolonged, the child's growth should be monitored.

Treatment should be provided to manage symptoms in the way most acceptable to the patient as compliance is likely to be an issue, due to the chronicity of the illness. Explain to parents the need for the regular application of medications and work together in order to develop an effective therapeutic alliance.

Management in pregnancy

Pregnancy may induce rhinitis due to hormonal changes or people with VR may become pregnant with subsequent worsening of their pre-existing symptoms. Rhinitis (in all its forms) affects at least 20% of pregnancies and can occur at any stage.

Pregnancy-associated rhinitis is thought to be due to nasal vascular engorgement and the effects of placental growth hormone. As most medications cross the placenta, interventions should be restrained and minimized; nasal douching (gentle irrigation of the nasal cavity with salt water) and beclometasone, budesonide and fluticasone have been found to be safe. Loratadine, cetirizine and chlorphenamine may also be used but decongestants are not recommended. If possible, medication use should be avoided within the first trimester as this is the period of organogenesis during which the foetus is most susceptible to congenital malformation. Antihistamines are selectively concentrated in breast milk and should be avoided while nursing.

When should specialist referral be considered?

Referral to specialist services should be considered if the disease history does not fit the typical presentation described. Further investigations may be required outside primary care. Should symptoms fail to resolve with the application of topical steroids, or if polyps are suspected, referral should be made to the ENT specialists for investigation. Chronic purulent or bloodstained nasal discharge should prompt urgent referral. It is important to bear each individual's risk factors in mind when considering the urgency of requests for review.

Key points

- Rhinitis leads to a reduction in quality of life and predisposes sufferers to asthma
- VR is the commonest form of non-allergic rhinitis and has a poorer prognosis than the allergic variant. As with any chronic illness, patients need to be prepared to manage their symptoms for the long term
- VR is diagnosed by history and specific investigations. Skin prick testing for common and suspected potential allergens is useful and can prevent patients incurring unnecessary expenditure
- First-line treatment is with antihistamines and nasal steroids. Correct application of nasal steroids improves efficacy and may reduce the risk of epistaxis. Ipratropium bromide nasal spray is effective against rhinorrhoea
- Children with rhinitis should be managed with the lowest possible dose of intra-nasal steroid. However, failure to adequately control symptoms can lead to oral and facial abnormalities and behavioural difficulties
- During pregnancy, treatment options are restricted although certain steroid and antihistamine preparations are suitable for use

REFERENCES AND FURTHER INFORMATION

- Garay, R. (2004). Mechanisms of vasomotor rhinitis. *Allergy*, 59 (Suppl 76), 4–9. doi:10.1111/j.0108-1675.2004.00388.x
- RCGP Curriculum statement 15.4: ENT and facial problems. Retrieved from: www.rcgp-curriculum.org.uk/PDF/curr_15_4_ENT_and_facial_problems.pdf
- Scadding GK., Durham SR., Mirakian R., Jones NS., Leech SC, Farooque S, . . . Nasser SM (2008) BSACI guidelines for the management of allergic and non-allergic rhinitis. *Clinical and Experimental Allergy*, 38, 19–42. doi:10.1111/j.1365-2222.2007.02888
- Smith, H.E. (2012). Hayfever and allergic rhinitis. *InnovAiT*. 5 (4): 220–225 doi:10.1093/innovait/inr082

Prof. Helen Smith

Chair of Primary Care, Brighton and Sussex Medical School, East Sussex

E-mail: h.e.smith@bsms.ac.uk

Dr Simon Glew

Academic Clinical Fellow, General Practice Trainee ST2, Brighton and Sussex Medical School, East Sussex