

Review article

Primary care: the cornerstone of diagnosis of allergic rhinitis

Allergic rhinitis (AR) is a very common disease with over 600 million people (200 million of them with concomitant asthma) worldwide suffering from it. The majority of patients who seek medical advice are seen in primary care. Although there is a selection of guidelines focused on the management of AR, there is a paucity of guidance on how best to identify patients who would most benefit from treatment. The aim of this paper was to review the best practice for primary care with respect to the diagnosis of AR within that clinical environment.

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Objective

There is a selection of guidelines focussed on the management of allergic rhinitis (AR) but a paucity of guidance on how best to identify patients who would most benefit from treatment. The aim of this paper was to review the best practice for primary care with respect to the diagnosis of AR within that clinical environment. The diagnosis and diagnostic approach are analysed from the perspective of

the epidemiology and disease burden of AR in the primary care population, the definition of AR, and the diagnostic yield of history taking, followed by physical examination and further testing. It is important to recognize that this 'best practice' has to be translated to local circumstances and population characteristics, including the healthcare system regulations under which primary care has to operate. Management of AR is not part of this review.

Epidemiology and impact of allergic rhinitis

Allergic rhinitis is the commonest chronic recurrent disease of the developed world and is increasingly

Abbreviations: AR, allergic rhinitis; ENT, ear, nose and throat; GP, general practitioner; IgE, immunoglobulin E; NAR, nonallergic rhinitis; ORL, otorhinolaryngology; SIgE, specific IgE; SPT, skin prick test.

important in developing countries. An estimated 600 million people worldwide suffer from AR, 200 million of them suffering concomitantly from asthma (1) with a further large number suffering from nasal hyperreactivity to nonallergic stimuli – nonallergic rhinitis (NAR) (2, 3). Prevalence is increasing in all populations throughout the world (4, 5) of which a part remains unrecognized and thus undiagnosed (6).

In primary care, a prevalence of AR of 10/1000 is reported (with an annual incidence of 2/1000) (7, 8). This confirms that AR, as with (most) other health problems, is open to the ecology of medical care (9), with only a proportion of patients consulting their general practitioner (GP) leaving substantial numbers applying self care of their AR, not all of which is appropriate.

Allergic rhinitis has an impact on daily functioning (including school and work) and quality of life (10, 11), a

direct consequence of the associated sleep disturbance (12–14). Allergic rhinitis is not only a burden for the patients themselves, but also their family members, and influences social life (15). This impact can be underestimated, and symptoms trivialized by health care professionals and patients.

To understand the impact of AR, the relation to other respiratory morbidity should be taken into account (16), in particular asthma (Fig. 1), as up to 80% of patients with asthma have concomitant AR (17–19).

Allergic and nonallergic rhinitis

Allergic rhinitis is defined by the presence of sneezing, nasal discharge, postnasal drip, itchy nose and bilateral nasal obstruction (Fig. 2) (20, 21). Allergic triggers – most commonly pollens, house dust mite, animal dander, insects (cockroaches) and moulds – are causal factors, although these may differ by country and region. The frequency with which these symptoms are present are described in Fig. 3, as most sufferers do not have the full range of symptoms. Figure 4 summarizes the immunoglobulin E (IgE)-mediated mechanisms of triggering factors and the role of the mast cells in this process (22, 23).

Allergic rhinitis is a part of the spectrum of IgE-mediated allergic disease. Figure 1 illustrates the complex nature of co-morbidity due to the common causal pathway again highlighting the link between the upper and lower airways (17, 18, 24). The direct link between the upper and lower airways is perhaps more obvious given that the mucous membranes of the upper and lower airways are contiguous and very similar. The mediators

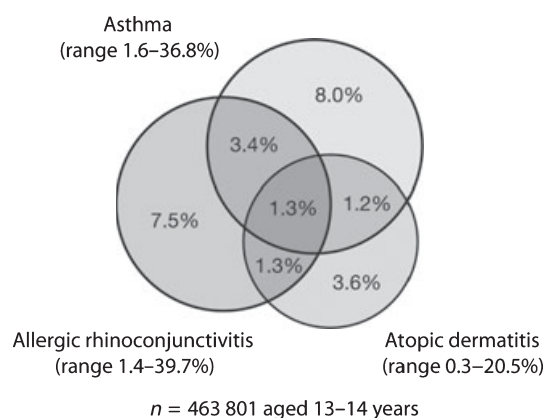


Figure 1. Allergic disease co-morbidities (5).

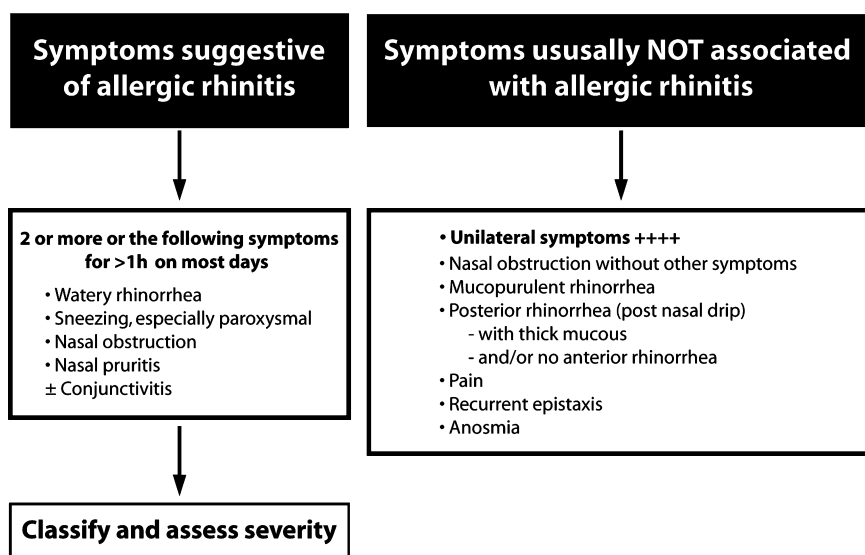


Figure 2. Pharmacy diagnosis of allergic rhinitis (43).

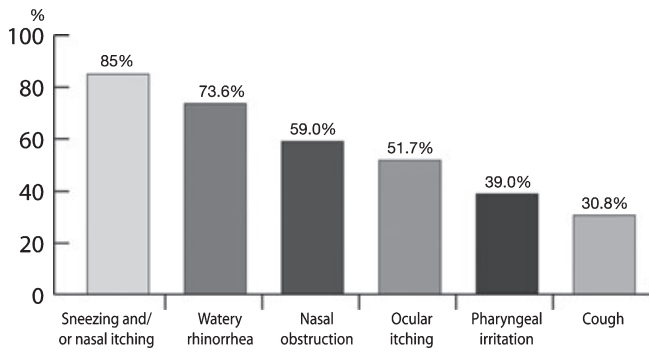


Figure 3. Frequency of symptoms in allergic rhinitis in the primary care population (13).

involved are also similar in upper and lower airways (25) but the adjacent anatomical structures differ, leading to differing expression of symptoms. This overlap of pathophysiology of upper and lower airway disease makes it imperative to include information of lower airways symptoms and their trigger factors in the diagnosis of AR.

Patients with rhinitis may suffer from either allergic or nonallergic rhinitis (Table 1). Nonallergic rhinitis is not a single entity but a common denominator for rhinitis symptoms not caused by allergen or infection (25). Nonallergic rhinitis on one hand can be based on a number of triggers and causes, like drugs, environmental triggers, hormones, exercise and stress. On the other hand, a patient with AR can also suffer from symptoms triggered by nonallergic stimuli like smoke, temperature differences and odours. Clinical features are similar, and patients may suffer from both types at the same time. This may explain the patient-reported triggers in population surveys (Fig. 5) (26). NAR is more common in females, is more persistent in nature and more often associated with headaches (27). NAR is triggered by odours, smoke, temperature changes and spicy foods (28), infections, drugs and hormones (29). Exposure to triggers at work and during hobbies should be considered explicitly when

Table 1. Allergic and nonallergic rhinitis

Possible causes of nonallergic rhinitis	Differences with allergic rhinitis
Infectious: Viral or bacterial (including acute rhinosinusitis). These may cause symptoms very similar to allergic rhinitis	Duration (shorter)
Structural: deviated nasal septum, polyps, turbinate hypertrophy	Unilateral symptoms Abnormal findings on ENT examination
Medication: aspirin, NSAIDs, antihypertensives, nasal vasoconstrictors	Symptoms only after exposure Rhinitis medicamentosa
Culinary: spices, especially chillis, dietary salicylates	
Emotional: anger, sexual arousal	
Exercise, cold air	
Alcohol due to vasodilation of the mucous membranes causing stuffiness	
Drugs related (cocaine)	
Irritative, e.g. induced by smoke, air particulates, high ground level ozone concentration	Exacerbate underlying rhinitis

evaluating NAR. Occupational rhinitis – defined as work-related sneezing, nasal discharge and nasal obstruction (30) – exemplifies the mixed nature of AR and NAR, as it involves physical, chemical or biological trigger factors. Proteins from animals or plants can cause AR whereas low molecular mass substances, such as industrial chemicals cause nonallergic rhinitis symptoms (31).

Identifying triggers and avoiding them may aid considerably when it comes to patient management. Allergic rhinitis responds better to anti-allergic treatment than NAR (3). This suggests that a basic allergy assessment, including, when needed, skin prick testing (SPT) and/or specific IgE (SIgE) is important to differentiate between AR and NAR. Even though NAR does not respond to medication as well as AR, it is especially useful in terms of patient management to recognize the nonallergic nature of this disorder and to attempt to identify its aetiology.

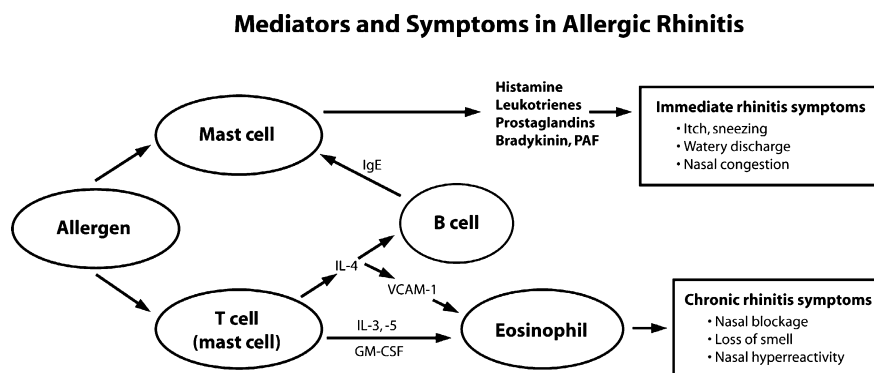


Figure 4. Mechanisms of allergic rhinitis (22, 23).

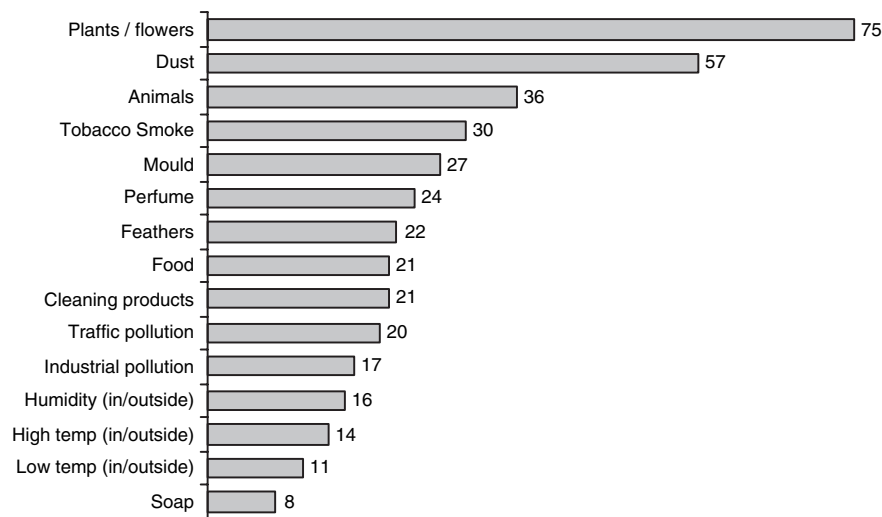


Figure 5. Reported triggers of nonallergic rhinitis (26).

Signs and symptoms of allergic rhinitis

Rhinitis symptoms are frequently presented in general practice. Blocked or runny itchy nose, sneezing, heavy head, impaired sleep, snoring, fatigue and a pervading feeling of being miserable are recognized as symptoms of the common cold. Everyone has suffered from this condition at some stage of their lives and can empathize with fellow sufferers. Allergic rhinitis can in its presentation resemble the ‘common cold’ in the symptoms it causes – important diagnostic differences are sneezing bouts, profuse bilateral anterior rhinorrhea, longer duration and persistent or recurrent nature of the symptoms and the presence of eye symptoms (Table 2). This semblance of a cold may lead to the impact of AR being trivialized, dismissed or misdiagnosed as a ‘prolonged common cold’, in particular in the winter season. One of the lay terms for seasonal AR is ‘summer cold’ (32). Figure 6 (7) presents the

seasonal distribution of new diagnoses of AR in general practice and illustrates that patients may present symptoms throughout the year, with a peak in Spring and Summer.

Allergic rhinitis during the Winter and early Spring is caused in Southern Europe by house dust mite and cypress pollen and in Northern Europe by house dust mite, furred animals and deciduous tree pollen allergy. Local, regional and country-specific information and knowledge of aero allergens aids recognition and diagnosis of AR as these may differ substantially from place to place.

Presentation of AR in general practice

Table 3 summarizes patients’ reasons for contacting their GP at presentation of AR (33). Along with typical

Table 2. Is it a cold or an allergy?

	Cold	Allergic rhinitis
Runny nose	Common	Common
Stuffy nose	Common and often severe	Common and variable in severity
Sneezing	Usual	Common
Itchy nose	Never	Usual
Nasal pain	Usual	Never
Itchy eyes	Rare or never	Common
Cough	Common	Often
Fever	Rare	Never
General aches, pain	Slight	Never
Fatigue, weakness	Slight	Sometimes slight
Sore throat	Common	Never
Itchy palate and throat	Never	Sometimes
Duration	3–14 days	Weeks to months

Source: National Institute of Allergy and Infectious Diseases. Adapted from: <http://www3.niaid.nih.gov/healthscience/healthtopics/allergicDiseases/PDF/ColdAllergy.pdf>.

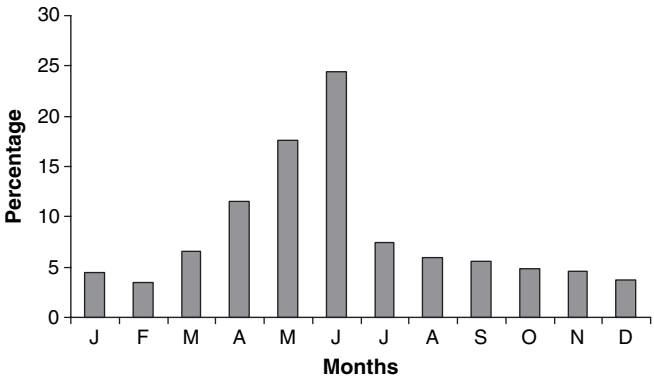


Figure 6. New cases of allergic rhinitis. Annual distribution of new cases of allergic rhinitis diagnosed in general practice in the Nijmegen Continuous Morbidity Registration (7, 8). This will of necessity vary from region to region and country to country.

symptoms of sneezing and nasal congestion, and medication requests for symptom relief, a (tentative) self-diagnosis by the patient is among the most frequent reason for presentation. Allergic rhinitis is often recognized by patients from pattern recognition of their symptoms (26, 28, 29), emphasizing the importance of eliciting patients' own observations as to what possible triggers they have identified, and stresses the importance of enquiring after what the patient has already tried by way of medication or advice before proposing AR management.

Patients recognize the burden that AR places on them (10–14, 34) but it is important to realize that this burden can be equally significant in unrecognized or undiagnosed disease (35). There is evidence that AR with more severe or frequent AR symptoms increases the likelihood of seeking formal medical care; these patients also exhibit a greater preponderance of allergic co-morbidities such as asthma and eczema (36).

Table 3 lists a large variety of other less specific presentations, illustrating the fact that the diagnosis of AR can be difficult and requiring more detailed history taking, physical examination and, where appropriate, SPT or SIgE antibody testing and/or specialist support.

Healthcare provision and diagnosis of AR

Healthcare systems vary worldwide with differing access to primary and specialist care. Although there is a general trend to strengthen the role of integrated primary care, in some countries paediatricians still provide all health care to children, or patients have direct access to an allergist or ENT surgeon or there little or no access to specialist care at all. These variations in health care delivery – both in terms of expertise and development – require that general recommendations have to be tailored to local circumstances.

Table 3. Presentation of signs and symptoms before diagnosis of allergic rhinitis by their GP (34)

Patients' reason for consulting	Frequency (%)	Cumulative (%)
Hay fever, allergic rhinitis	32	32
Sneezing/nasal congestion	19	51
Request for medication	15	66
Upper respiratory infection	7	73
Cough	3	76
Other symptoms nose	3	79
Advice, health education	2	81
Eye symptoms	2	83
Shortness of breath	2	85
Medical examination	1	86
Symptoms throat	1	87
Symptoms sinus	1	88
Headache	1	89

Data from the Amsterdam Transition Project.

Nevertheless, there are more similarities than differences, when looking at the clinical content of primary care. The model of the 'ecology of medical care' (9) provides a frame of reference that is helpful to delineate the diagnosis of AR. This model states that (i) only a minority of individuals who experience health problems will contact medical care, virtually always the GP; and (ii) most of these are managed by their GP. Thus supporting and strengthening both the role and capacity of primary care is strategically important. This should both be disease specific – in this case AR – and at the same time holistic, acknowledging the integrated generalist nature of general practice, to be successful (37–39).

For this to be achieved, it is important that knowledge and skills in the management of AR *in the primary care setting* are developed, and implemented in routine practice. Interface management between primary care physicians and secondary care allergy specialists is an integral part of this process. There is evidence of much room for improvement (40), but experience from Finland (in asthma management), the UK and The Netherlands present valuable lessons (40–42).

From the ecology model it follows that it is even more important to provide information for patients to aid self-diagnosis and management and advice of when to contact their GP. This requires collaboration of all providers in the community and in particular inclusion of community pharmacists (43).

Patients seek advice from many sources (Fig. 7) (15) and it is important that this advice is valid, structured and focussed. When needed additional appropriate diagnostic undertakings should be encouraged (15). In this context it is important to emphasize that upper and lower airways diseases frequently appear together and understanding their triggers and the whole allergy picture of the patient may be beneficial for the appropriate diagnosis.

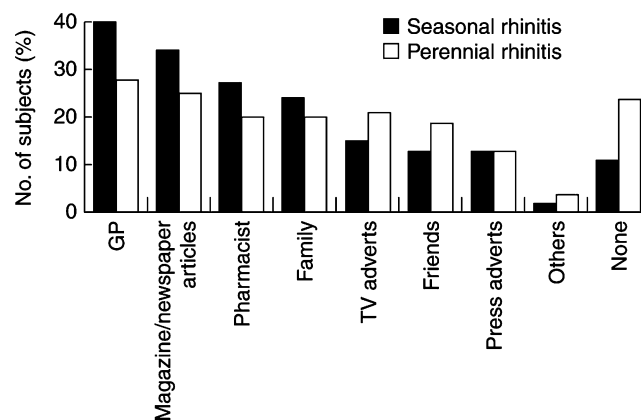


Figure 7. Sources of information for patients for diagnosis and management of allergic rhinitis (15).

Diagnosis in primary care

History taking – Sir William Osler's adage 'Listen to the patient: He is telling you the diagnosis' – is the key to diagnosing AR. Patients will often spontaneously report symptoms as summarized in Figs 2 and 3, or reveal them after prompting. Important in the history taking is to establish the nature and duration of the symptoms, which is the most reliable way to distinguish from acute upper respiratory tract infections. Another dimension of history taking is establishing the *severity* and the *impact* of the symptoms, in gauging interference with sleep and daily social, school and work activities. Symptom triggers (Fig. 5) (26, 28, 29, 44) have often already been observed by the patient. When the history is not clear in this respect, it can be helpful to invite the patient to keep a diary correlating symptoms and triggers. Frequently the patient's presentation facilitates ready diagnosis (Fig. 2) of AR. When the history is not as clear it can be helpful to resort to a structured approach as provided by an AR questionnaire (Table 4) (45) which also assists in the assessment of severity.

An important aspect of history taking is to establish appropriate signs and symptoms that permit confirmation of AR while identifying those signs and symptoms that are incompatible with the diagnosis of AR. These should be flagged, diagnosed appropriately and, when indicated, considered for referral (see paragraph 'red flags' below).

Specific points of attention in history taking. Patients will often have noticed triggers but may also have used medication purchased over the counter that may have (partly) suppressed symptoms. It is therefore important to ask after self-medication and how this was used especially as to whether they were taken regularly or intermittently. The family physician should be acquainted with the most important allergic trigger factors present in the community in which they work – including work and hobby related triggers. This knowledge will guide if and which additional tests, including SIgE antibody tests, may be appropriate.

Cough is a symptom generated from the lower airways and may suggest the co-existence of asthma (46). Dysfunction of taste or smell may also be features of AR (47–49).

Next to symptoms and triggers, the presence of allergic co-morbidity will strongly support diagnosis. This can be asked for, but is often already available in the medical records of the GP:

- A personal history, in particular asthma, but also eczema;
- A family history of eczema, asthma or AR.

Physical examination

A number of findings on physical examination can support the diagnosis:

- A small skin crease just proximal to the tip of the nose due to constant wiping of the nose;
- Nasal polyps – with a grey mucousy colour in contrast with the bright red normally seen with hypertrophied turbinates (Fig. 8). Polyps may indicate aspirin sensitivity.

External examination may lead to suspect deviation of the nasal septum (Fig. 8). This finding is in itself unrelated to AR, but can explain unilateral preponderance of symptoms.

Findings suggestive of other diagnoses. Choanal polyps are the most common polyp in children. They are benign lesions arising from the mucosa of the maxillary sinus, which grow into the maxillary sinus and reach choana causing unilateral nasal obstruction (50). Although in primary care the finding of nasal polyps is very rare in children, multiple nasal polyps are *highly suggestive of cystic fibrosis*; this finding in children should lead to consideration of this condition and *not* be regarded a pointer to AR. Thus it is recommended that the finding of nasal polyps in children should prompt referral.

Table 4. Questionnaire for diagnosis and impact of allergic rhinitis (47)

During the past year, have you had daytime blocked nose, an itchy nose, mucus secretion in throat, sneezing and a runny nose/rhinorrhea – or at night – a blocked nose, sleep disorder, awakenings during the night with symptoms, which do not seem to be caused by a common cold?	☐ Yes	☐ No
Do these symptoms restrict your regular activities at home or at work, your hobbies or your sleep?	☐ Yes	☐ No
When do the symptoms mentioned above occur?	☐ Winter ☐ Spring ☐ No clear variation, the symptoms are persistent	☐ Summer ☐ Autumn
For how long do the symptoms occur?	☐ Less than 4 days a week or less than 4 weeks in a year (intermittent) <i>or</i> ☐ More than 4 days a week or more than 4 weeks in a year (persistent)?	

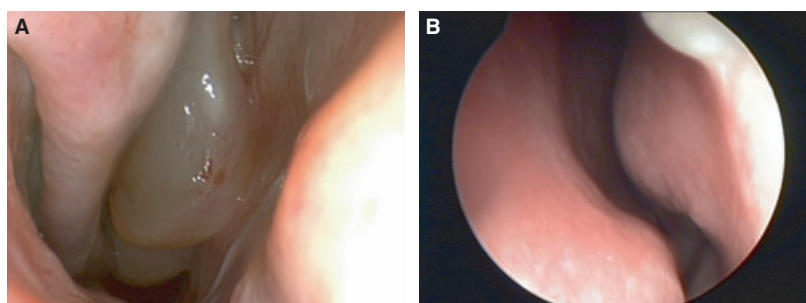


Figure 8. The features of nasal polyps in allergic rhinitis (A) and septum deviation (B). Courtesy of Prof. W Fokkens.

It is important to stress that normal findings on physical examination do not rule-out AR.

Additional testing

The diagnosis can be supported by the performance of SPT or allergen SIgE testing of blood serum (previously referred to as radioallergosorbent test). Many allergens are available to be used in SPT or SIgE testing. In this context it is important to note that although a positive finding certainly indicates atopy (i.e. that the patient has been sensitized to the allergen) this finding does not confirm allergy.

A common reason to pursue additional testing (SIgE or SPT) is when the patient's history is difficult to interpret. This is particularly the case with persistent symptoms, where correlation with triggers is often less obvious. SIgE testing should be directed at allergens prevalent in the patients' and practices' geographical area, such as pollens, house dust mite, cat, relevant moulds. Such testing would of course be guided by knowledge of the important prevalent aeroallergens. Another reason for testing is failure of (self) medication. This should lead to reconsideration of the diagnosis.

When specific information about possible underlying allergy is essential and the patient suffers from severe eczema or reactive skin (dermatographism) SIgE tests are preferred to skin tests. It should be noted that several classes of medications, including anti-histamines and possibly systemic steroids, make the performance of skin tests inaccurate. Detailed information about the sensitization profile may be beneficial in the management of AR, when immunotherapy is to be considered.

Indications for referral

If diagnosis is difficult or unclear it is advised to refer or seek advice from a specialist. If nasal obstruction is the only symptom, diagnoses other than AR should be considered: nasal polyps, deviated nasal septum and in children hypertrophy of the adenoids. These may be referred routinely.

Red flag signs: urgent referral

Patients presenting with a recent or new symptom of bloody and/or unilateral nasal discharge should be referred urgently for ENT (ORL) assessment to rule out a neoplastic disorder.

Recent onset of unilateral signs of nasal obstruction in children most likely points to a foreign body and this is often accompanied by foul smelling discharge.

Cerebrospinal fluid rhinorrhea

Clear, watery discharge, usually unilateral, sometimes after history of head trauma. Typical is that the watery discharge goes on during sleep (patients wakes up with watery stain on pillow). Diagnosis is made by beta-transferine measurement of the secretion.

Children presenting with nasal polyps should be tested for cystic fibrosis and referred accordingly.

Therapeutic reasons for referral or specialist advice. Allergic rhinitis can be classified on the basis of the occurrence

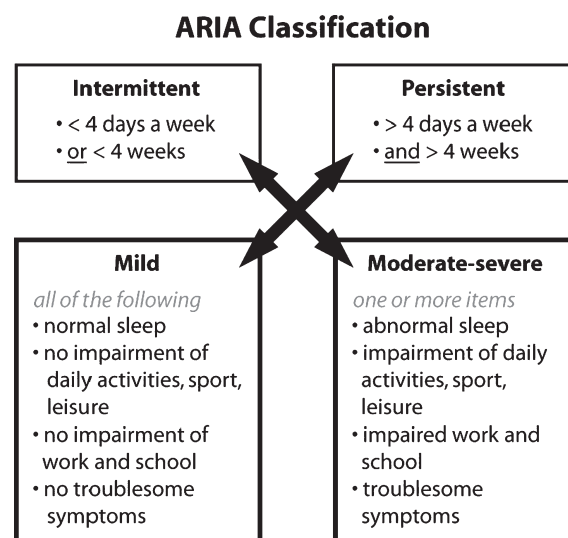


Figure 9. ARIA classification of severity of allergic rhinitis (20).

of symptoms as intermittent or persistent, and on their impact as in mild or moderate to severe (Fig. 9, Table 4) (15, 51).

Patients failing to respond to standard treatment should be considered for referral, in order to determine whether the correct diagnosis has been made and if so to seek treatment management optimization.

Patients with a firm diagnosis, who do not respond to standard therapy in whom symptoms are persistent and/

or disabling, merit referral for consideration of Immunotherapy.

Conclusion

Allergic rhinitis is a common disease of which the severity impact is underestimated. A structured assessment at presentation can facilitate diagnosis and assist in optimizing outcomes.

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