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A NARRATIVE REVIEW ON ALLERGIC RHINITIS

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ABSTRACT

Allergic rhinitis (AR) is an immunoglobulin E (IgE)-mediated inflammatory disorder of the nasal mucosa that follows exposure to inhaled allergens and is characterised by sneezing, nasal itching, rhinorrhoea and nasal obstruction. It affects several hundred million people worldwide, impairs sleep, school and work performance, and frequently coexists with asthma and allergic conjunctivitis. This narrative review summarises current knowledge on the epidemiology, risk factors, pathophysiology, clinical features, classification, diagnosis and management of AR, and examines the place of homoeopathy in its management. Relevant guidelines, reviews and clinical studies were identified through searches of Google Scholar, and remedy indications were drawn from Boericke's *Materia Medica* and read in the light of Hahnemann's *Organon of Medicine*; the material was synthesised narratively. The literature shows that AR is a systemic airway condition rather than an isolated nasal complaint, that diagnosis rests mainly on a careful history supported by allergen-specific testing, and that management combines allergen avoidance, pharmacotherapy (intranasal corticosteroids, antihistamines and combination products), allergen immunotherapy and patient education. Classical homoeopathic texts list remedies for acute coryza and hay fever, but Hahnemann's method requires a remedy to be chosen on the totality of the individual patient's symptoms rather than on the disease name. The few clinical trials of homoeopathy in AR are small and varied, and several tested allergen preparations rather than individualised prescribing, so the

evidence is not yet sufficient to support its use. Recent guidelines emphasise a structured, evidence-graded and patient-centred approach. Further work is needed on phenotype-specific treatment, long-term disease modification and strategies for primary prevention.

KEYWORDS: Allergic rhinitis; IgE; ARIA; intranasal corticosteroids; antihistamines; allergen immunotherapy; homoeopathy.

INTRODUCTION

Allergic rhinitis is a symptomatic disorder of the nose induced, after allergen exposure, by an IgE-mediated inflammation of the membranes lining the nose^[1]. The cardinal symptoms are sneezing, watery nasal discharge, nasal itching and nasal blockage, and these are often accompanied by ocular symptoms such as itching and watering of the eyes^[1,2]. Recent reviews and consensus statements describe AR as a heterogeneous, type 2-driven disease of the upper airway and set its diagnosis and treatment within an evidence-based framework^[3-5].

AR is among the most common chronic conditions worldwide. The Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update estimated that more than 600 million people of all ages and ethnic groups are affected^[1]. The prevalence of allergic diseases has been rising as societies adopt Western lifestyles^[6]. Although AR is rarely life-threatening, it carries a marked burden: it affects quality of life, sleep, concentration, school attendance and workplace productivity, and it generates considerable direct and indirect costs^[6,7]. Reported prevalence varies widely with age, region and case definition, with estimates ranging from roughly 10% to 40%^[3,4], so any single worldwide figure should be read as approximate.

In India, the Global Asthma Network Phase I survey of 127,309 children and adults found AR in 7.7% of children aged 6–7 years, 23.5% of adolescents aged 13–14 years and 9.8% of adults, with a slight decline over two decades among children and adolescents^[8]. A narrative review of Indian data describes a rise in allergic diseases over the past two decades, wide variation in prevalence between regions and a large absolute burden in a population of more than 1.3 billion, while noting that the Global Asthma Network data show a recent decrease in children^[9].

AR is also important because of its links with other conditions. Both AR and asthma are regarded as inflammatory diseases of the airways that often coexist in the same patient, and evidence of systemic immunological and inflammatory changes in AR supports the concept

of a united airway^[1,10,11]. Early and accurate recognition of AR is therefore relevant to primary care physicians, paediatricians, otolaryngologists and allergists alike. Population-based data show that rhinitis is associated with asthma in both atopic and non-atopic individuals^[12].

The aim of this narrative review is to provide a concise, up-to-date overview of the epidemiology, aetiology, pathophysiology, clinical presentation, diagnosis and conventional management of allergic rhinitis, drawing on major international guidelines and key reviews, and to examine the place of homoeopathy in its management by describing remedy indications in a classical materia medica, the principle of individualised prescribing, and the clinical trial evidence available.

MATERIALS AND METHODS

This work is a narrative review. The conventional literature was searched using Google Scholar . Search terms included “allergic rhinitis”, “hay fever”, “ARIA”, “pathophysiology”, “diagnosis”, “intranasal corticosteroids”, “antihistamines” and “allergen immunotherapy”, used alone and in combination. The homoeopathic literature was searched separately by combining “homoeopathy”, “homoeopathic”, “homeopathy” and “homeopathic” with “allergic rhinitis”, “hay fever”, “pollinosis” and “*Galphimia glauca*”.

Articles published in English were considered. Priority was given to international guidelines, consensus reports, systematic reviews and authoritative narrative reviews, supplemented by selected clinical studies that addressed the topics covered. Articles were selected by the authors on the basis of relevance to the topics covered, recency, publication in a peer-reviewed journal or by a recognised guideline group, and the strength of the study design.

For homoeopathic therapeutics, two classical texts were consulted: Boericke’s Pocket Manual of Homoeopathic Materia Medica with Repertory^[13], for remedy indications, and Hahnemann’s Organon of Medicine^[14], for the principles of case-taking and remedy selection. Five remedies are described: *Allium cepa*, *Sabadilla*, *Ambrosia artemisiaefolia*, *Nux vomica* and *Natrum muriaticum*. They were chosen because Boericke’s entries for them centre on sneezing, watery coryza or hay fever-like symptoms, which are the dominant features of AR. The selection is illustrative rather than exhaustive and does not rank the remedies by efficacy. Because this is a narrative rather than a systematic review, no formal

quality appraisal or meta-analysis was performed, and the findings were synthesised descriptively under thematic headings.

RESULTS AND DISCUSSION

Epidemiology and burden

AR affects people of all ages and ethnic groups, and its prevalence has increased in many regions as populations urbanise and adopt Western lifestyles^[1,6]. A systematic review of the burden of allergic respiratory disease highlighted the substantial effects of AR on sleep, daily functioning, work and school performance, and healthcare costs^[7]. The condition is frequently under-diagnosed and under-treated because patients and clinicians may regard it as a trivial complaint^[1,2]. Repeat ISAAC surveys of children documented marked variation between regions and rising symptom prevalence of allergic rhinoconjunctivitis in many centres^[15]. Surveys of adults in the United States, Latin America and the Asia-Pacific region found that a substantial proportion of respondents reported that their nasal allergy symptoms interfered with daily life^[16], and a review in adolescents likewise documented effects on sleep, school performance and quality of life^[17]. Rhinitis also reduces work productivity, mainly through reduced performance while at work (presenteeism) rather than absence from work^[18], and seasonal AR has been associated with poorer examination performance in teenagers^[19].

Aetiology and risk factors

Risk factors for AR are well recognised. Indoor allergens (such as house dust mites, animal dander, moulds and cockroach), outdoor allergens (such as grass, tree and weed pollens) and occupational agents can all provoke rhinitis and other allergic diseases^[1]. A personal or family history of atopy is an important predisposing factor, and environmental changes associated with Western lifestyles have been linked to the rising prevalence of sensitisation^[2,6]. Exposure to non-allergic triggers such as tobacco smoke, strong odours and air pollution may aggravate symptoms in sensitised individuals^[2]. Historical analyses indicate that hay fever was uncommon before the nineteenth century and became increasingly frequent with industrialisation and urbanisation^[20], and the hygiene hypothesis arose from the observation that hay fever was less frequent in children from larger families^[21].

Pathophysiology

AR begins with sensitisation, in which allergen-specific IgE is produced and becomes bound to high-affinity receptors on mast cells and basophils in the nasal mucosa. On re-exposure,

allergen cross-links the bound IgE and triggers release of preformed and newly formed mediators, including histamine and cysteinyl leukotrienes, producing the early-phase symptoms of sneezing, itching, rhinorrhoea and vasodilatation-related congestion^[2]. A later phase, occurring several hours afterwards, is characterised by recruitment of eosinophils and other inflammatory cells and is associated with persistent congestion and nasal hyperreactivity^[2,11]. The cellular events underlying this response, including the central role of mast cells and of IgE, have been reviewed in detail^[22]. The sequence of events is summarised in Figure 1.

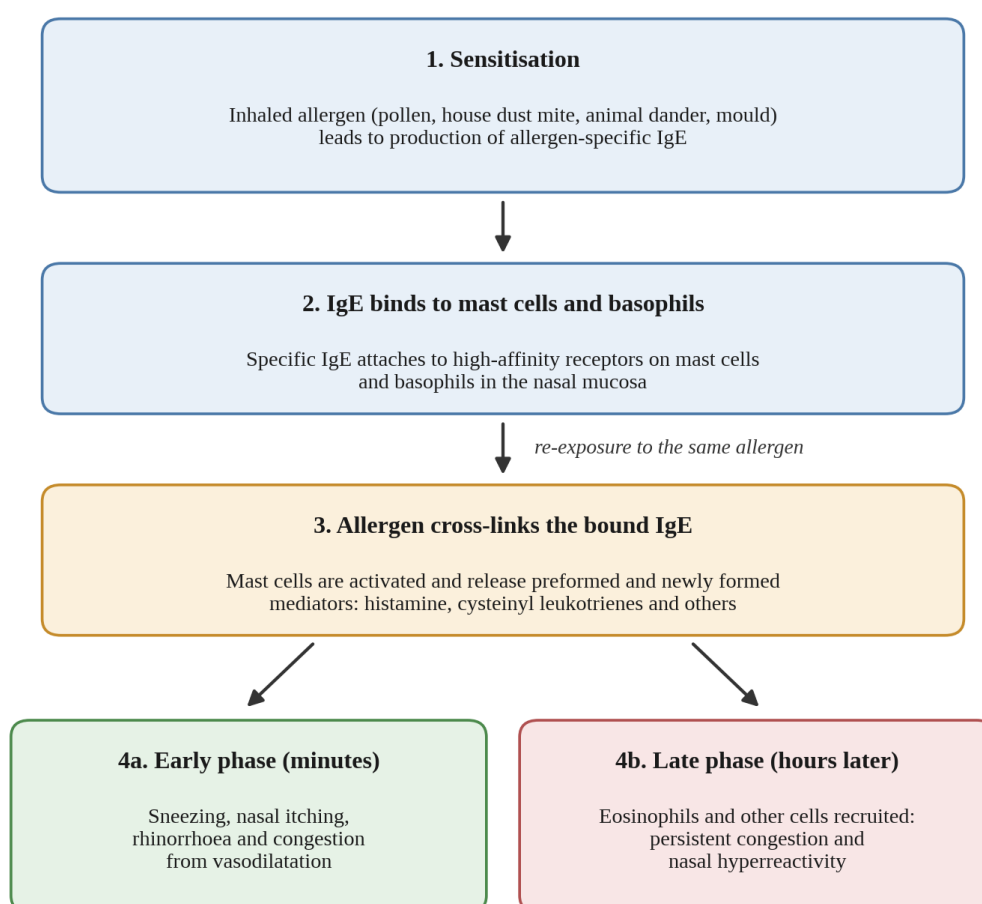


Figure 1. Sequence of events in the allergic reaction in allergic rhinitis. Schematic prepared by the authors from the mechanisms described in the text^[2,11,22].

Importantly, patients with AR show evidence of systemic immunological involvement, such as raised numbers of circulating eosinophils and basophils that correlate with symptom severity, supporting links between the upper and lower airways^[11]. More recently, rhinitis has been described in terms of distinct phenotypes and endotypes, an approach intended to allow

more individualised management^[23]. Current mechanistic models also emphasise the contribution of the nasal epithelium and of type 2 cytokine-driven inflammation^[24].

Clinical features and classification

The typical presentation comprises paroxysmal sneezing, watery rhinorrhoea, nasal itching and nasal obstruction, often with itchy, red, watery eyes, throat itching and postnasal drip^[2]. Sleep disturbance, fatigue and impaired concentration are common and may be more troublesome than the nasal symptoms themselves^[2,7].

The older division into seasonal and perennial disease has been supplemented by the ARIA classification. Rhinitis is described as intermittent or persistent according to symptom duration, and as mild or moderate-to-severe according to its effect on sleep, daily activities, school and work^[1,10]. This classification relates more closely to treatment decisions than the earlier scheme. Common comorbidities include asthma, allergic conjunctivitis, rhinosinusitis and sleep-disordered breathing, and their presence should be sought in every patient with AR^[1,2].

Diagnosis

The diagnosis of AR is based chiefly on a careful history and examination, supported by evidence of allergen sensitisation. The history should explore the pattern and timing of symptoms, likely triggers, family history of atopy, comorbid conditions, and the effect on sleep and daily life. Anterior rhinoscopy may show pale or bluish, swollen turbinates with watery secretions. Allergy testing, by skin prick testing or measurement of serum allergen-specific IgE, is used to confirm sensitisation and to identify relevant allergens, and tests should be interpreted in the light of the clinical history because sensitisation alone does not establish disease. Other causes of nasal symptoms, including non-allergic rhinitis, infective rhinosinusitis, structural abnormalities and medication-induced rhinitis, should be considered in the differential diagnosis^[2,25]. Skin prick testing, performed with standardised extracts and with positive (histamine) and negative controls, remains the most widely used method of demonstrating sensitisation^[26]. Graded, evidence-based recommendations on the diagnostic work-up are available in an international consensus statement^[27].

Management

Management of AR rests on four elements: allergen avoidance and environmental measures, pharmacotherapy, allergen immunotherapy, and patient education^[1,2,25]. Where a clinically

relevant allergen has been identified, reasonable avoidance measures may be advised, although the evidence for single measures is limited and their benefit can be modest^[2,25]. Stepwise treatment algorithms based on symptom severity are also set out in national guidance^[28]. The main options are compared in Table 1.

Pharmacotherapy is selected according to symptom severity and predominant complaints. Intranasal corticosteroids are the most effective single class of agents for controlling the full range of nasal symptoms and are recommended as first-line treatment for moderate-to-severe disease. Second-generation oral antihistamines are effective for sneezing, itching and rhinorrhoea and are widely used for mild or intermittent symptoms, whereas intranasal antihistamines act rapidly and can be combined with intranasal corticosteroids when monotherapy is inadequate^[25,29,30]. Leukotriene receptor antagonists are generally considered less effective than intranasal corticosteroids and are usually reserved for selected patients, such as those with coexisting asthma^[25,30]. Topical decongestants provide short-term relief of blockage but should not be used continuously because of the risk of rebound congestion^[2,25]. Randomised trials and systematic reviews indicate that intranasal corticosteroids control nasal symptoms better than oral antihistamines^[31], that a fixed-dose combination of intranasal azelastine and fluticasone is more effective than either component alone^[32], and that antileukotriene agents are less effective than intranasal corticosteroids^[33]. First-generation antihistamines are best avoided because of sedation and impaired performance^[34].

Allergen immunotherapy, given by the subcutaneous or sublingual route, is the only treatment that can modify the underlying allergic response and may produce benefit that persists after treatment is stopped. It is considered for patients whose symptoms are inadequately controlled by pharmacotherapy or who prefer to avoid long-term medication, provided the symptoms are clearly linked to a demonstrated sensitisation^[2,25,35]. Each route has its own practical advantages and risks, and the choice should be individualised^[35]. Meta-analyses of randomised trials show that both subcutaneous and sublingual immunotherapy reduce symptoms and medication use in AR^[36,37]. Long-term benefit after discontinuation has been demonstrated for grass pollen immunotherapy^[38,39], and a 10-year follow-up of children treated for seasonal rhinoconjunctivitis suggested a lasting preventive effect on the development of asthma^[40]. Evidence-based guidance on patient selection, products and schedules is available^[41].

Guideline development has itself been evolving. The ARIA group has moved from consensus-based recommendations towards guidelines developed with the GRADE approach, and more recent proposals incorporate real-world evidence, including data from digital tools used by patients, to support treatment strategies that are both evidence-based and patient-centred^[29,42]. The 2010 revision of the ARIA guidelines was an early step in this direction, applying the GRADE approach to treatment recommendations^[43]. Patient education about the chronic nature of the disease, correct use of nasal sprays and realistic expectations of treatment is an essential companion to any drug regimen^[2,25].

Table 1. Comparison of treatment options for allergic rhinitis.

Treatment option	Main role and effect	Limitations and cautions
Allergen avoidance and environmental measures	Advised when a clinically relevant allergen has been identified ^[1,2,25]	Evidence for single measures is limited and benefit can be modest ^[2,25]
Second-generation oral antihistamines	Effective for sneezing, itching and rhinorrhoea; widely used for mild or intermittent symptoms ^[25,29,30]	Control nasal symptoms less well than intranasal corticosteroids ^[31]
Intranasal corticosteroids	Most effective single class for the full range of nasal symptoms; first-line for moderate-to-severe disease ^[25,29,30]	Correct use of the spray and realistic expectations need patient education ^[2,25]
Intranasal antihistamines, alone or combined with a corticosteroid	Act rapidly; combination with an intranasal corticosteroid when monotherapy is inadequate; azelastine with fluticasone more effective than either alone ^[25,29,30,32]	Combination is used when monotherapy gives inadequate control ^[25,29,30]
Leukotriene receptor antagonists	Reserved for selected patients, such as those with coexisting asthma ^[25,30]	Generally less effective than intranasal corticosteroids ^[25,30,33]
Topical decongestants	Short-term relief of nasal blockage ^[2,25]	Not for continuous use because of rebound congestion ^[2,25]
First-generation antihistamines	Best avoided	Sedation and impaired performance ^[34]
Allergen immunotherapy (subcutaneous or sublingual)	Only treatment that can modify the underlying allergic response; reduces symptoms and medication use; benefit may persist after stopping ^[2,25,35-37]	Needs symptoms clearly linked to demonstrated sensitisation; considered when pharmacotherapy is inadequate or long-term medication is unwanted; each route has its own risks ^[2,25,35]

Treatment option	Main role and effect	Limitations and cautions
Homoeopathic remedies	Chosen on the individual symptom picture in Hahnemann's method; some trials used allergen-based preparations (see Homoeopathic therapeutics)	Evidence not yet sufficient: trials are few, small and varied in design

Homoeopathic therapeutics

Allium cepa is described for coryza in which the nasal discharge is acrid while the lachrymal discharge is bland, often with laryngeal involvement (singers' cold). The complaints are worse in a warm room and in the evening and better in the open air, and the remedy is said to suit phlegmatic persons and colds that follow damp, cold weather^[13].

Sabadilla is described as acting on the nasal mucous membrane and the lachrymal glands and as producing a coryza that resembles hay fever, which is the basis of its homoeopathic use. The picture includes chilliness with sensitivity to cold, spasmodic sneezing with a running nose, severe frontal headache with red, watering eyes, and a copious watery nasal discharge^[13].

Ambrosia artemisiaefolia is recommended for hay fever with watering of the eyes and intolerable itching of the eyelids. Other features listed are watery coryza with sneezing, nosebleed, a stuffed-up feeling in the nose and head, and irritation of the trachea and bronchial tubes with asthmatic attacks and a wheezy cough^[13].

Nux vomica is described for a coryza that is fluent by day but blocked at night and outdoors, or that alternates between the nostrils. Bleeding in the morning and an acrid discharge accompanied by a stuffed-up feeling are also noted^[13].

Natrum muriaticum is described for a violent, fluent coryza lasting one to three days before turning into nasal obstruction with difficult breathing. The discharge is thin and watery, like raw egg white, and the sneezing is violent. The text also lists loss of smell and taste, internal soreness and dryness of the nose, and traditionally recommends the remedy for cutting short a cold that begins with sneezing^[13].

The remedies above are grouped under a disease heading only for convenience of reference, because in Hahnemann's method a remedy is not prescribed for a disease name. The

physician records the whole symptom picture of the patient, in mind and body, as seen by an unprejudiced observer (Organon §6); the totality of the symptoms is the sole guide to the choice of remedy (§18); and in choosing among candidate remedies the striking, singular, uncommon and peculiar (characteristic) symptoms of the case carry the most weight (§153)^[14]. Two patients with the same diagnosis of allergic rhinitis may therefore need different remedies, and one remedy may suit patients with different diagnoses. The indications given above are starting points for comparison with the patient's own modalities, general symptoms and mental state, not a fixed prescription.

Clinical research on homoeopathy in allergic rhinitis is limited and heterogeneous, and most of it does not test individualised prescribing. Three of the controlled trials tested preparations made from allergens: homoeopathic dilutions of pollen in hay fever^[44], a 30c preparation of the principal inhalant allergen in perennial rhinitis^[45], and a preparation of common regional allergens in seasonal rhinitis^[46]. Hahnemann distinguished homoeopathy, which treats with a substance whose action on the healthy resembles the disease, from isopathy, which treats with the very agent or product that causes the disease (Organon §56, footnote)^[14]. Allergen-based preparations of this kind are therefore closer to isopathy than to the individualised prescribing described above, and these trials cannot be taken as evidence for individualised prescribing. The meta-analysis of *Galphimia glauca* in pollinosis^[47] concerned a single remedy used for a diagnosis rather than for an individual symptom picture. The large cohort of patients treated in routine homoeopathic practice found allergic rhinitis among the commonly treated conditions^[48] but, being an uncontrolled cohort, cannot show that the treatment caused any improvement.

The results of the trials were not always consistent between objective and subjective outcomes. In the trial of Taylor et al.^[45], 51 patients with perennial rhinitis received either an oral 30c preparation of the principal inhalant allergen or placebo. Nasal inspiratory peak flow improved significantly more with homoeopathy than with placebo (mean difference 19.8 l/min, 95% confidence interval 10.4 to 29.1), but on average the symptom visual analogue scores did not differ significantly between the groups, and initial aggravation of symptoms was more common with homoeopathy (30% against 7%). A symptom benefit was reported only when these results were pooled with those of three earlier trials in the same series^[45]. The trial of regional allergen preparations^[46] was small, and its authors regarded their findings as preliminary.

The evidence is therefore not yet sufficient to support the use of homoeopathic treatment for allergic rhinitis, whether individualised or allergen-based. The trials are few, small and varied in design, their effects differ between objective and subjective measures, and they have been the subject of methodological debate. Larger, rigorously designed trials, including trials of individualised prescribing as defined above, are needed before conclusions about effectiveness can be drawn.

Limitations and gaps in knowledge

As a narrative review, this work is subject to selection bias, and the studies included were not formally appraised for quality. Searching was limited to a single database (Google Scholar), so relevant papers may have been missed. The remedy descriptions rest on one classical materia medica, and the five remedies described are a selection and not a complete list. Important gaps remain, including the long-term effectiveness of treatment strategies tailored to specific phenotypes and endotypes, standardised outcome measures and comparative data on different forms of immunotherapy^[49], strategies to prevent the onset of sensitisation^[50] and the progression of rhinitis to asthma^[51], better management of uncontrolled disease that overlaps with chronic rhinosinusitis^[52], and the validation of digital, real-world approaches to care^[53].

CONCLUSION

Allergic rhinitis is a common, chronic and often underestimated IgE-mediated disease of the upper airway that has a considerable impact on quality of life, productivity and healthcare use and is closely linked to asthma and other airway disorders. Diagnosis relies on a thorough history supported by allergen-specific testing. Effective management combines allergen avoidance, appropriately selected pharmacotherapy, allergen immunotherapy where indicated, and sustained patient education. Classical homoeopathic texts list remedies for acute coryza and hay fever, and Hahnemann's method requires a remedy to be chosen on the totality of the individual patient's symptoms rather than on the disease name. The clinical evidence for homoeopathy in allergic rhinitis is not yet sufficient to support its use: the available trials are few, small and varied in design, and several tested allergen preparations, which are not individualised prescribing in Hahnemann's sense. Evidence-graded, patient-centred guidelines now provide a clear framework for care, but further research is needed on phenotype-specific treatment, disease modification and prevention, and on individualised homoeopathic prescribing in particular.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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AUTHOR CONTRIBUTIONS

Conceptualisation: Aathesh.S. Literature search and data collection: Abhiram.V.R. Writing, original draft: Adithyalalkrishna. Review and editing: Afra.S. Supervision: Sibin.R.A. All authors read and approved the final manuscript.

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