

Nasobronchial Allergy or Allergic Rhinobronchitis; The Unified Concept: A Review with a Special Reference to India

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ABSTRACT

The close and constant association of allergic rhinitis (AR) and asthma, both in children and adults, is hardly mentioned in medical textbooks. Proper treatment is delayed, as these patients are often seen in rotation by chest physicians, allergy experts, otolaryngologists, general physicians and paediatricians. Even then treatment is directed mainly towards asthma with little attention being paid to associated rhinitis, often lying unrecognised in adults. The clinical pattern of asthma in children and adults differs in our country. Unless AR is treated simultaneously with asthma, recurrent AR will result likely in suboptimal control of asthma. Proof and argument is brought forward to recognise the unified concept of nasobronchial allergy or rhinobronchitis for proper management.

Key words : Allergic rhinitis, Asthma, Allergic sinusitis, Unified concept, Nasobronchial allergy.

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INTRODUCTION

Asthma and allergic rhinitis (AR) may develop concurrently or even sequentially and have similar natural histories and exacerbation¹. It may thus be compared to a coin, with two different sides and argument is put forward for the unified concept of nasobronchial allergy or allergic rhinobronchitis^{1,2}. The concept will benefit the management³⁻⁵, which at present runs into the domain of several categories of medical personnel *viz*, chest physicians, allergy experts, otolaryngologists, general physicians and paediatricians. It, thus, results in confused therapy with some unintended but considerable delay in proper management. AR and asthma are now treated on the recommendations by

two separately issued guidelines by two international committees^{3,5}.

CLINICAL PATTERN OF ASTHMA AND ALLERGIC RHINITIS IN EASTERN INDIA

Childhood asthma, mostly being of extrinsic type in our country⁸, is predominated by allergic rhinitis (AR) initially and in early stages and has a history of strong familial atopy^{2,4}. Similar observations has been recorded in children by other workers, reporting 88.2% with AR⁷ and with 83.3% atopy in family⁸. Allergic rhinitis often leading to allergic sinusitis⁹⁻¹¹ may be associated together with perennial asthma, as

recorded in India also^{12,13}. Ocular allergy, rhinitis, sinusitis, and asthma may exist together or may follow one another in succession¹⁴⁻¹⁷.

In an earlier report on 316 children (1998-1999) from Eastern India², the clinical presentation of asthma was nearly identical in 98% cases. In all these extrinsic asthma cases, rhinitis ('cold', as mentioned by parents) was followed in a day or two by cough, bronchospasm and was often followed by fever. Presumed viral infection occurred in 1-2% cases only. In another series⁶, the pattern gradually changed in over 89.3%, as the child grew older while having treatment. Rhinitis became subdued in nearly one third of cases, though intermittent nasal block persisted⁶ with post-nasal drip, as evidenced by subconscious and frequent, irritating, throat clearing sounds. In a 10-year follow-up of 118 cases of a series of over 700 children⁶, sinusitis (affecting usually maxillary and frontal sinuses) gradually developed in 45% of cases. It was shown clinically by frontal heaviness, headache and feeling of dragging sensation below eyes. Attacks of acute bronchospasm followed, with recurrence of symptoms of rhinitis especially with change of seasons in 87% of cases^{4,9}. This was also seen in a report from Jaipur¹². Nearly one in eight children had visited otolaryngologists for various surgical operations (sinus drainage, correction of deviated nasal septum, removal of swollen, inferior turbinates, mistaken as polyps, tonsils and adenoids etc.) with no permanent relief^{4,6}. Almost a similar number were erroneously treated for tuberculosis, for reasons described elsewhere^{4,9}.

In 1637 adults in Eastern India, earlier referred to (during 1998-1999)² and over 6000 adults in an earlier series⁶, the pattern of asthma was different⁶. Nearly 93% with matrilineal inheritance gave a history of typical childhood attacks. Some cases had associated probable initial childhood viral infections. Nearly 30% got mild remissions during pubescence⁶, though allergic rhinitis persisted in subdued form with symptomatic post-nasal drip. Symptoms of sinusitis and rhinitis became more frequent, followed by seasonal exacerbation of asthma. It was seen usually in winter and in rains in 91%

of the patients in our earlier series of 7208 cases⁶. Similar high incidence of rhinitis in seasonal exacerbation has also been noticed from Jaipur in Rajasthan¹². Nearly 61% of 1637 cases, referred to earlier, had evidence of chronic sinusitis, both radiologically and clinically².

EPIDEMIOLOGICAL DATA

In a long-term study of college-students, allergic rhinitis (AR) and asthma were found to be closely linked¹⁴. In another oft-quoted earlier report¹⁷, 40% of AR cases had associated asthma, while 30-80% of asthmatics had AR. These figures appear to be considerable underestimates, as noted by us² and also by Kapsali and Colleagues¹⁸. Nearly 99% of their 475 cases had exacerbation of allergic asthma and AR at the same time of the year. A new terminology of 'chronic allergic total airways disease syndrome' was coined by them. In another population survey report, the same frequent association was observed¹⁹.

One of the markers of allergy in blood (IgE) was raised in our cases with rhinitis only, as compared to the control population²⁰. Allergic rhinitis associated with asthma had even higher levels than AR alone²⁰. The level of IgE was statistically related to the duration of AR and asthma, even the so-called intrinsic variety of asthma showed high levels by other workers^{20,21}.

The incidence of both AR and asthma is rising, both seasonal and perennial, especially in UK, USA, Sweden and Australia²²⁻²⁷. However, the distinction between childhood and adult asthma and the role of AR and their proper management^{4,22} have not been highlighted so far by most of the textbooks on respiratory diseases and medicine^{28,29}. A textbook in India is somewhat non-committal on this issue³⁰, although rising incidence of AR and asthma is commented upon^{30,31}.

IMMUNOPATHOLOGICAL CHANGES

Both upper and lower respiratory tracts behave similarly under allergenic assault with

minor differences¹. In asthma, epithelial injury with disorganisation of its structure, loss of cilia and subepithelial collagen deposition are always noted^{32,33}. In contrast, epithelial shedding and disorganisation to that extreme is not common in allergic rhinitis. When airway epithelial cells (AEC) are damaged, allergens and inhaled chemicals penetrate deep in the submucosa³⁴.

After immunological challenge, there is recruitment from blood and tissues and subsequent activation of the CD4+ helper cells with TH2 phenotype and effector cells like eosinophils, basophils and mast cells in upper and lower respiratory tracts.

Barnes³² suggests insignificant role of mast cells in AR, while others believe that degradation of preformed granules (in mast cells in nose), following allergen-challenge, initiates the immunohistological changes both in AR and asthma^{22,35}.

PHYSIOLOGICAL CHANGES

Singh and Co-workers³⁶ from India have demonstrated that frictional resistance of forced breathing through partially blocked nostril helps to maintain the nasal obstruction and inflammation in allergic rhinitis. Frictional stress similarly becomes very high in narrowed airways in asthmatics; even higher, during coughing due to similar mechanism^{37,38}.

Nasal challenge with environmental stimuli as cold air inhalation or chemical stimuli as histamine or methacholine may lead to bronchoconstriction, even when the subject has only allergic rhinitis, as was shown earlier by Thiruvengadam and Co-workers from India^{39,40}. Bucca and Colleagues⁴¹ have shown that concurrent extrathoracic airway hyperresponsiveness and bronchial hyperreactivity become evident in 40.6% cases, when manifest AR was present with a normal spirometry.

The response of nasal challenge can be blocked by using local anaesthetics (which suppresses the afferent arc) or by abolishing the afferent arc through anti-cholinergics^{42,43}. It has

been postulated recently that during the processing and conditioning of inhaled air through nose and upper respiratory tract, the allergenic activity of inhaled allergens may be increased⁴⁴.

ACTION OF PHARMACOLOGICAL AGENTS AND THERAPY

There are some similarities as also differences in the action of certain drugs in upper and lower airways : (a) β_2 adrenergic agonist drugs have no action on allergic rhinitis (AR) but these are good bronchodilators in asthma³ and (b) alpha-adrenergic receptors and pseudoephedrine act as an active vasoconstrictor in AR¹ but shows little effect on asthma^{5,22}. However, other drugs like oral and inhaled corticosteroids, inhaled sodium cromoglycate and ipratropium bromide act similarly and are used for treatment of both asthma and rhinitis^{3,5}.

Inhaled steroids given for AR alone also seems to be somewhat effective on asthma without entering the LRT⁴⁵. Radiolabelled beclomethasone dipropionate (BDP) spray in nose showed little evidence of entering the lungs. Moreover, the mean size of the inhalant nasal spray particles are about 30 μ m in size, which cannot travel to lower airways⁴⁶.

Though some workers have demonstrated good effect in AR, even when steroid MDIs are administered to LRT⁴⁷ alone, our clinical experience has been the opposite⁹. Recurrence of AR in our cases was frequent, even with controlled asthma⁴⁸. We advocate the use of all drugs and MDI for AR, as recommended by the consensus committee^{4,5}, in addition to the therapy for asthma simultaneously^{3,4,9}. These procedures, however, need intense patient cooperation and compliance through patient education programme^{49,50}.

As stated earlier, antihistamines (the second generation, non-sedating drugs like fexofenadine or loratadine) has good effect on AR but has no effect on established or chronic asthma as such⁵¹, though seasonal asthma may show some improvement⁴⁵. However, inhaled

steroids are stated to be more effective than antihistamines in all counts of sneezing, itching, nasal watering and nasal block, as has been shown by a recent meta-analysis by Weiner *et al*¹⁵. We, in contrast, are impressed by the rapid action of suitable antihistamines in our cases in AR. Theophylline, a drug under renewed interest and often used for asthma, has been found useful for AR also⁵². No large scale trial of theophylline in AR has been undertaken so far. Another new drug cisteinyl leucotriene modifiers has been investigated for use in asthma and also for AR⁵³.

PROGNOSIS

Allergic rhinitis (AR) is easily treatable but recurrence is very common because of unfettered access of allergens through inspired air. Even patients with controlled asthma get frequent occurrence of AR⁴⁸. This appears quickly during a comprehensive therapy for bronchial asthma alone, if AR remains untreated^{4,9}. Persistent AR and sinusitis are responsible for morbidity in 59.3% of our adult asthmatics⁵⁴. Nearly 33% of our untreated asthmatic adults complain bitterly of these problems and state these to be as incapacitating, as that of an attack of asthma⁹. Relief is not quick like use of relievers in asthma. Persistent headache, nose block, sneezing, frequent throat-clearing sounds, mouth-breathing, irritability, feeling of exhaustion, loss of sleep and other problems of AR and sinusitis may affect the quality of life⁵⁵. Similar observations have been made by other workers⁵⁶. Treatment of sinusitis alone often gives considerable relief of asthma⁵⁷. Surgical help is needed in some cases of sinusitis^{13,56}, but rarely for AR alone. Both AR and asthma are benefitted to a variable extent by current treatment and may be considered together instead of two separate entities^{1,3,5}.

CONCLUSION

In conclusion, concurrent nasobronchial allergy must be remembered by clinicians for treatment of asthma and rhinitis simultaneously to get the maximum benefit^{1,2}. The two

separately issued guidelines for AR and asthma management may somewhat confuse the issue but drugs prescribed are the same except the use of bronchodilators in asthma and decongestants and antihistamines in allergic rhinitis.

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