

Case Report

Curcumin in the patient with perennial allergic rhinitis with chronic episodic allergic asthma

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ABSTRACT

A 24-year-old man presented with history of severe wheezing in the last 5 days. He had a history of skin allergy since childhood. He had a strong family history of similar complaints present in mother and other sibling. He was diagnosed with allergic rhinitis. He regularly uses ICS/LABA inhaler and fluticasone nasal spray, tablet bilastine 20 mg once daily and oral bronchodilators frequently. Bioavailable curcumin was added to his usual treatment regimen. Bio AV curcumin tab 500 mg (from Edence Life Sciences Pvt Ltd) twice daily was prescribed for 2 months. Curcumin was added to his usual treatment regimen. Curcumin Bio AV tab 500 mg twice daily was prescribed for 2 months followed by once daily dosing regimen which he continued even at 4 months follow up. After giving curcumin his oral steroids requirements reduced significantly while he continues the inhaled medications. Curcumin has potent anti-inflammatory and anti-allergic effects. Curcumin relieves the symptoms of both asthma and allergic rhinitis. Curcumin was found to exert diverse immunomodulatory effects in these disorders. Curcumin can have a place in the management of allergic rhinitis and asthma.

Keywords: Allergic rhinitis, Asthma, Curcumin

INTRODUCTION

Allergic rhinitis (AR) is often encountered in clinical practice. AR is an immunoglobulin E-mediated disease occurring in response to allergens. In India, perennial allergic rhinitis is often seen in clinical practice. The symptoms associated with AR include Symptoms include sneezing, rhinorrhea, and nasal congestion, obstruction, and pruritus. Asthma is another disorder associated with an allergic disposition. Inadequate treatment of AR can increase the risk of development of asthma in the future.

The treatment approach to AR includes allergen avoidance and pharmacotherapy. The treatment regimen includes intra-nasal corticosteroids as first-line therapy for persistent symptoms.¹ In patients with more severe

disease not responding to intranasal corticosteroids must be treated with antihistamines, decongestants, leukotriene receptor antagonists, cromolyn, and nasal irrigation, if needed.

Subcutaneous or sublingual immunotherapy is a treatment option for inadequately controlled patients and in patients with allergic asthma.¹ The management of AR continues to pose challenges due to inadequate response of the patient, patient adherence to treatment and impaired quality of life of the patients.¹

CASE REPORT

A 24-year-old man presented with history of severe wheezing in the last 5 days.

Past history

He had a history of similar episodes present since his childhood when he was in school. He gave an associated history of sneezing, running nose more so on dust exposure. He had a history of skin allergy since childhood.

Family history

He had a strong family history of similar complaints present in mother and other sibling.

Past treatment

He regularly uses ICS/ LABA inhaler and fluticasone nasal spray, Tablet bilastine 20 mg once daily and oral bronchodilators frequently.

Recently his need for oral prednisolone increased, which resulted in weight gain.

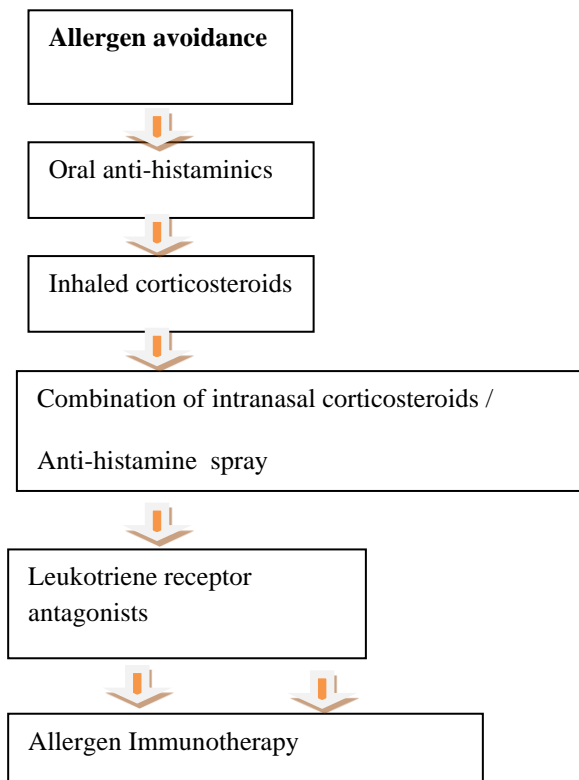


Figure 1: Step wise management of allergic rhinitis.

Examination findings

Signs that were suggestive of allergic rhinitis were observed such persistent mouth breathing, rubbing at the nose, an obvious transverse nasal crease, frequent sniffing or throat clearing, and allergic shiners.

Examination of the nose typically revealed swelling of the nasal mucosa and pale, thin secretions. An internal

endoscopic examination of the nose for structural abnormalities excluded the presence of nasal septal deviation, nasal ulcerations, and nasal polyps. Chest examination revealed bilateral wheezing.

X ray chest was normal. Eosinophils were 14%, AEC 1450, IgE 1020 initially. On subsequent follow up, the values were Eosinophils 9%, Absolute eosinophil count (AEC) 720, IgE 640. Though they were not normalized, there was a significant reduction after initiating the treatment. X Ray PNS showed turbinate hypertrophy.

Investigation findings

Raised eosinophils, elevated IgE, PFT: moderate airway reversible obstruction, allergy testing showed allergies to HDM, pigeons, parthenium grass, cockroach, egg, peanuts, tur daal and cow milk.

Diagnosis

A diagnosis of perennial allergic rhinitis with chronic episodic allergic asthma was made.

Treatment

Curcumin was added to his usual treatment regimen. Curcumin Bio AV tab 500 mg twice daily was prescribed for 2 months followed by once daily dosing regimen which he continued even at 4 months follow up. After giving curcumin his oral steroids requirements reduced significantly while he continues the inhaled medications which also, we are planning to reduce the dosage. The patient was advised to avoid allergens that trigger his attacks.

Outcome of treatment

The patient reported reduced wheezing and episodes of sneezing and rhinorrhea after 2 months of ingestion of curcumin. He has not used oral steroids since the past 2 months. He continues to use the inhaler and nasal spray, and he has been advised to reduce the dose of the inhaler and nasal spray.

He also noticed that his skin allergy had totally disappeared over past 2 months. Investigations done 2 weeks ago showed reduction in eosinophils and IgE values. Lung function also showed mild improvement and his quality of life improved as well with no nocturnal wheeze.

He was advised to continue curcumin for another 3 months while continuing to try to reduce the oral medication and then the dose of inhaled medicine.

DISCUSSION

Epidemiological studies have indicated that allergic rhinitis and asthma often occur together due to the shared

common physiology. This concept is called as the united airway disease. The presence of allergic rhinitis is a risk factor for development of asthma. Patients with asthma and rhinitis have increased bronchial hyperresponsiveness and reactivity to diverse stimuli. Immunopathology of allergic rhinitis involves a predominance of T-helper type 2 inflammation and tissue eosinophilia. The united airway theory has been

explained by the local airway inflammation which can lead to a systemic inflammatory response.¹ But, the current drugs to treat asthma and allergic rhinitis do not have disease-modifying efficacy. Therefore there is an essential need to develop new drugs that might be of additional benefit in clinical settings. The use of corticosteroids for anti-inflammatory effects is common in asthma and allergic rhinitis (Figure 1).²

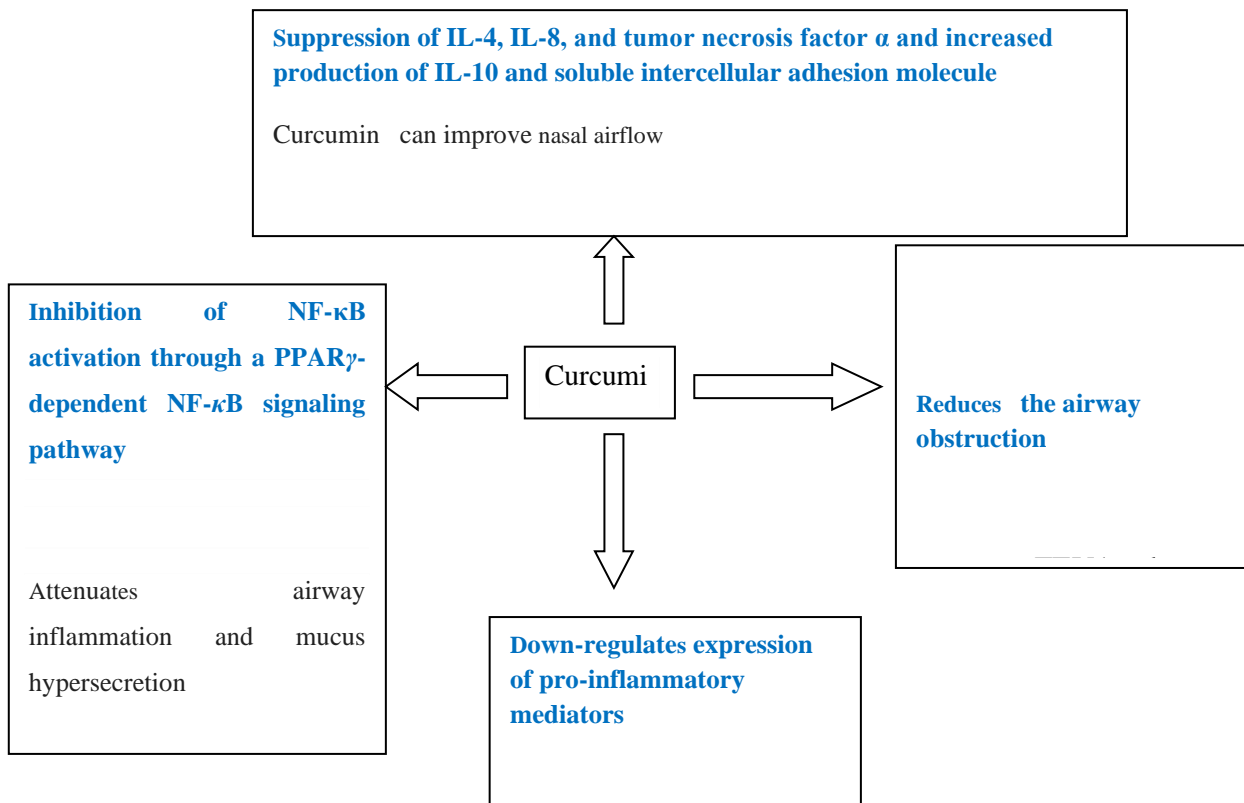


Figure 2: Properties of Curcumin that can help in allergic rhinitis and asthma.

Curcumin, is a phytochemical found in turmeric, the rhizome of *Curcuma longa*. Curcumin has diverse pharmacological properties such as anti-inflammatory, anti-allergic and anti-asthmatic properties.³ Curcumin has beneficial effects in inflammatory conditions such as asthma and allergy due to its properties of modulating the immune system.⁴ Curcumin can modulate the activation of T cells, B cells, macrophages, neutrophils, natural killer cells, and dendritic cells. Curcumin can downregulate the expression of pro-inflammatory cytokines such as TNF, IL-1, IL-2, IL-6, IL-8, IL-12 by inactivation of the transcription factor NF-kappaB.⁵

Curcumin protects against asthma by its action on mitogen-activated protein kinase (MAPK)/NF-κB signaling pathways.⁵ Curcumin inhibits airway inflammation, airway hyper-responsiveness and bronchoconstriction.⁶

Curcumin modulates its effects on the airways through the modulation of the PPARγ-dependent NF-κB signaling pathway.⁷ In preclinical studies, curcumin attenuated

airway inflammation and mucus hypersecretion through a PPARγ-dependent NF-κB signaling pathway.⁸ Curcumin can help in improving the airway obstruction and leads to a significant improvement in the mean FEV1 values. Curcumin also improves hematological parameters. Curcumin is well tolerated as an add-on therapy for the treatment of bronchial asthma.⁹ Zeng et al demonstrated that Curcumin inhibited the proliferation of airway smooth muscle by upregulating the expression of caveolin-1 and blocking the extracellular signal-regulated kinase (ERK) pathway activation.¹⁰ Biswas et al illustrated that curcumin can down-regulate expression of pro-inflammatory mediators, matrix metalloproteinases, adhesion molecules and growth factor receptor genes.¹¹

In allergic rhinitis, curcumin relieves nasal symptoms (sneezing and rhinorrhea) and nasal congestion through reduction of nasal airflow resistance. Curcumin exerts a wide range of immunomodulatory effects, such as suppression of IL-4, IL-8, and tumor necrosis factor α and increased production of IL-10 and soluble intercellular adhesion molecule. Curcumin can improve

nasal airflow and modulating immune response in patients with allergic rhinitis¹² (Figure 2).

This extensive anti-inflammatory evidence of curcumin in allergic rhinitis and asthma lends credence to finding a place for curcumin in the management of allergic rhinitis and asthma. Can curcumin reduce the use of corticosteroids remains to be studied? But one aspect of curcumin to consider is the fact that its bioavailability is low and this can adversely affect its clinical efficacy. The bioavailability of curcumin can be enhanced by several methods that increases the bioavailability by as much as 100-fold as compared to native curcumin.¹³ Improved bioavailability of formulated curcumin products is due to improved solubility, stability and possibly low first-pass metabolism.¹³

CONCLUSION

Curcumin has potent anti-inflammatory and anti-allergic effects. Curcumin relieves the symptoms of both asthma and allergic rhinitis. Curcumin was found to exert diverse immunomodulatory effects in these disorders. Curcumin can have a place in the management of allergic rhinitis and asthma.

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Ethical approval: Not required

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