

Allergic rhinitis - Impact on quality of life

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Abstract

Background: Allergic rhinitis is a universal health problem that affects people of all ages group, and has significant impact on quality of life. Allergic rhinitis (AR) is an IgE mediated hypersensitivity of the mucous membrane of the nasal airways characterized by nasal symptoms, such as nasal congestion, rhinorrhoea, sneezing and itchy nose. The most currently available therapeutic measures are both medical and surgical. **Aim:** To study the prevalence and management of allergic rhinitis and its impact on the quality of life of the selected patients. These patients were managed both medically and surgically in this study. **Materials and Methods:** A prospective study of 60 patients for a period of one year from 2017 June to 2018 June in department of ENT in Sree Balaji Medical College and Hospital, Chennai, India. The allergic skin prick test was done for all patients in the study population. Medical Management was included allergen avoidance and intranasal corticosteroid therapy in this study population. Partial inferior turbinectomy surgery was done in patients not responding to medical management. **Result:** The study showed male predominance in age group of 15-40yrs which is about 73% of population 30% of the study population belonged to manual labourers category. Majority of the patients (79%) showed improvement in symptoms with medical management. About 22% of study population showed improvement with surgical intervention with successive follow up. **Conclusion:** Current recommendations of allergic rhinitis include avoidance of allergens, pharmacotherapy, immunotherapy and surgery. Management should be significant to improve the quality of life of the patients. The study population showed improvement with medical management which includes intranasal steroid therapy. Those patients who were not responded to medical management, showed improvement with surgical intervention in the study population. Allergen avoidance was advised for all patients in this study population. The study showed improvement in the quality of life in patients with allergic rhinitis. The global warming and increase in industrialization, will affect the future prevalence of allergic rhinitis. Education of community about the increasing trends of disease, the importance of early and regular treatment to allergic rhinitis is necessary. **Key Words:** Allergic rhinitis; quality of life; corticosteroids; tubinectomy.

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INTRODUCTION

Allergic Rhinitis (AR) is defined as inflammation of the membranes lining the nose, and is characterized by nasal congestion, rhinorrhea, sneezing, itching of the nose and/or post-nasal discharge.¹ Allergic rhinitis is often

considered as a trivial disease which can significantly affect the quality of life (QOL) by causing fatigue, headache, sleep disturbances and cognitive impairment.² The global burden of allergic rhinitis was estimated to be about 500 million³, The prevalence of AR among all age groups varies from 10% to 40% in the Western countries.⁴ In India, studies have reported a prevalence ranging from 10% to 15%.⁵ Overall, the prevalence has increased over the recent decade probably due to changes in lifestyle, industrialization, and increase in air pollution.⁵ Allergic rhinitis is usually classified as seasonal or perennial. Patients with seasonal allergic rhinitis exhibit symptoms in response to exposure to pollen (such as from trees in spring, grasses in spring and summer, and weeds in autumn, although this depends on geographic location). Patients with perennial allergic rhinitis typically exhibit symptoms throughout the year.

Common perennial allergens include dust mites, cockroaches, molds, animal dander, and occupational allergens. Many patients may be sensitive to both seasonal and perennial allergens. Each type of allergic rhinitis may include a non allergic component precipitated by irritants such as tobacco smoke, temperature, or weather changes. Allergic rhinitis is classified into two different types as seasonal or perennial. Patients with seasonal allergic rhinitis have symptoms in response to exposure to pollen such as from trees in spring, grasses in spring and summer, and weeds in autumn, although this depends on geographic location. Perennial allergic rhinitis typically exhibit symptoms throughout the year. Common perennial allergens include dust mites, cockroaches, molds, animal dander, and occupational allergens. patients may be sensitive to both seasonal and perennial allergens. Each type of allergic rhinitis may include a non allergic component precipitated by irritants such as tobacco smoke, temperature, or weather changes. The Allergic Rhinitis and its Impact on Asthma (ARIA) Initiative Workshop Expert Panel, in collaboration with the World Health Organization, proposed guidelines for the management of allergic rhinitis based on data from randomized, controlled trials.^{6,7} Recommendations include allergen avoidance, pharmacologic treatment, specific immunotherapy, education, and surgery. It has been suggested that allergic rhinitis treatment should be approached in a stepwise fashion based on symptom severity, with pharmacotherapeutic agents comprising the main stay of treatment.^{6,7} Allergic rhinitis is now a recognized global health problem and affects the Quality of Life (QOL) in adults^{[8].⁹} in context of work productivity. Though rhinitis is often considered as a trivial condition, the overall impairment on work productivity may be similar to the health conditions that have been traditionally considered as being more severe from a medical perspective.¹⁰ The disease affects both children and adults, but data regarding its burden in adults and risk factors particularly in India is limited. The aim of the present study was to study the prevalence and management of allergic rhinitis in adults. Allergic rhinitis was primarily treated by allergen avoidance, medical treatment and surgical intervention in this study population.

MATERIALS AND METHODS

A prospective analysis of total of sixty patients of both sex in the age group of 15–60 years suffering from symptoms of Allergic Rhinitis visiting the OPD of department of ENT in Sree Balaji Medical College and Hospital, Chennai, India. The consent of all the patients for intranasal corticosteroid therapy and surgery was

obtained. A questionnaire was developed based on ARIA guidelines to diagnose allergic rhinitis in adults. The questionnaires were used to document relevant information regarding demographic profile, symptoms and risk factors of Allergic Rhinitis such as smoking status; environmental tobacco smoke exposure; occupational exposure to dust/smoke/gas and history of clinical allergy.

Allergic Skin Prick Tests: The allergic skin prick test was done in for all patients in the study population. Normal saline solution and histamine were used as negative and positive controls. After 20 minutes, the wheal diameter was measured by adding the largest diameter and its perpendicular diameter and dividing the sum with two the mean wheal diameter for each control and allergen were calculated. The test result was considered as positive if the mean wheal diameter was > 3mm.

Absolute eosinophil count (AEC): AEC was calculated both before and 3 months after the intranasal corticosteroid therapy and surgery for all patients study population.

Medical management: Intranasal fluticasone propionate nasal spray (two sprays per nostril per night, i.e., 100 mcg) was used for 3 months by all the patients in this study.

Surgical management (inferior Turbinectomy): The Surgical intervention was done in patients not responding to medical management in this study. Isolated inferior turbinate surgery was done for the patients with chronic nasal obstruction due to hypertrophy of inferior turbinate and was refractory to medical treatment. Inferior turbinate surgery is commonly performed for numerous conditions which cause nasal obstruction. Different techniques of inferior turbinectomy surgery includes Partial inferior turbinectomy (PIT) Inferior turbinoplasty (IT) Cryoturbinectomy (CT) and Laser turbinectomy (LT). Partial inferior turbinectomy (PIT) technique was employed for selected patients for partial removal of hypertrophied inferior turbinate. Thorough history, clinical examination and relevant investigations were carried out. All the patients were admitted on the previous day of surgery. Surgery was carried out under General anaesthesia (GA).

Partial inferior turbinectomy (PIT) technique: Angled turbinate scissors were used for this procedure. One blade was inserted beneath the inferior turbinate and the other on top of it after fracturing the turbinate medially. Resection includes the turbinate mucosa and bone. The extent of the resection depends upon the degree of hypertrophy.

Adjusted odds ratio: Adjusted Odds Ratio (aOR) was calculated by analysis for each potential explanatory

variable like age, sex, overcrowding, cross ventilation, environmental tobacco smoking, occupational exposure, clinical allergy, family history of allergic disorders in the study population.

Quality of life (QOL): The Quality of life (QOL) of the patients was calculated by using the Mini RQLQ questionnaire. Overall, QOL score was estimated from the mean score of all items.

Statistical analysis: Chi square test was applied to find out the association of different factors with allergic rhinitis.

RESULTS AND OBSERVATIONS

Baseline characteristics of the study population: Age, sex and symptoms: Among 60 patients in this study, 46 patients had sneezing, 45 patients had nasal obstruction, 36 patients had running nose, 20 patients had itching most common was among male young patients of age group 15-30 yrs. Majority of the patients were male (73%) among which mostly were manual labourers constituted, while females constituted 28% of the study population. The mean age of the study population was 32.45 years (± 11.01).

Prevalence of allergic rhinitis among study population: A majority of the study subjects were working as manual laborers (31%), followed by those that were skilled laborers (23%), students (3%), professionals (7%), and self-employed (6%).

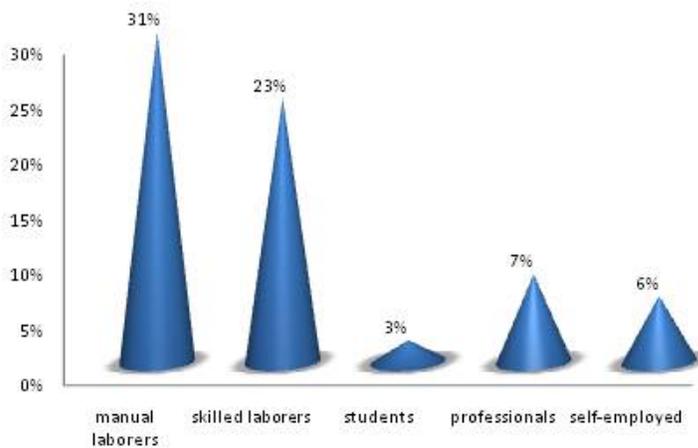


Figure 3: Prevalence of allergic rhinitis among study population

Allergic Skin Prick Tests

Almost all the patients (94%) were positive for allergic skin prick in the study. Most common allergen that gave a positive skin prick test was dust (57%) followed by pollen (39%) and mites (32%). In this study, we found 36% reported a positive family history of allergy

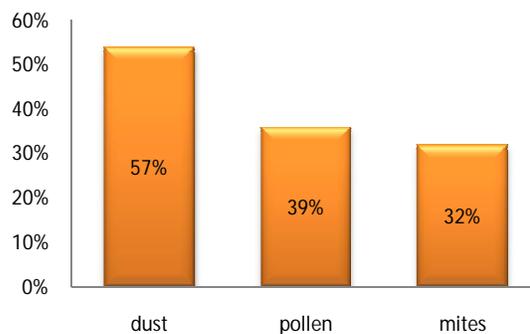


Figure 4: Allergic Skin Prick Tests

ADJUSTED ODDS RATIO: Overcrowding (aOR = 2.3), absence of cross-ventilation (aOR = 2.5), occupational exposure to dust/ smoke (aOR = 6.5), tobacco smoking (aOR = 2.1), family history of allergic diseases (aOR = 2.7) and clinical allergy (aOR = 10.2) were found calculated in the study population.

Absolute eosinophil count values: AEC was measured calculated both before and 3 months after the intranasal corticosteroid therapy and surgery for all patients. The mean AEC before the treatment was 516.65 (± 73.41). The mean AEC value was reduced to 321.71 (± 53.69) 3 months after the intranasal corticosteroid therapy and surgery. This difference was found to be statistically significant (0.001).

Allergen avoidance: Allergen avoidance counseling was done for all patients in the study population.

Quality of life scores (QOL): Quality of life scores (QOL) both before and after the intranasal corticosteroid therapy and surgery was calculated in this study. The mean QOL scores was 2.621 (± 0.441) before and after the treatment. The mean QOL scores reduced to 2.029 (± 0.384) before and after the intranasal corticosteroid therapy and surgery.

Treatment: A total number of 46 patients showed improvement medical management. 14 patients refractory to medical management improved. The study showed improvement in Quality of Life in the patients with both medical and surgical management.

DISCUSSION

The mean age of the study population was 32.45 years (± 11.01). Our series showed a male preponderance with 73% males and 28% females. The age of the study subjects ranged between 15 to 60 years. Two third of the study subjects were in the age group 32 to 50 years and 8.3% were above 50 years of age. Out of the total study subjects. More women had rhinitis compared to men (men: Women ratio 0.72).¹¹ A total of 695 workers participated in the study and 66.6% were females. The mean age was 34 years (range 18–59 years).¹² In our study, 46 patients had sneezing, 45 patients had nasal obstruction, 36 patients had running nose and 20 patients had itching sensation of nose and eyes. Watery runny nose was the most common symptom present in 128 subjects (97%), followed by nasal itching (88%), nasal obstruction (74%) and sneezing (33%) in the study of Sinha.¹¹ A majority of the study population belonged to the category of manual laborers. Majority of the study subjects were literate. Among the men, 95% were employed, mostly in professional/semi-professional work (26%) or, clerk/shopkeeper/farmer (31%) or, semi/unskilled work (23%). Eighty percent of the women were housewives.¹¹ A majority of the study subjects were

working as professionals (30%), followed by those that were self-employed (24%), students (22%), manual laborers (31%), and skilled laborers (23%).¹³ The present study 94% patients showed positive for allergic skin prick. This observation was similar with study done by others which showed that the majority of the study populations were positive for “allergic skin pricks tests” (94%). Most common allergen that gave a positive “skin prick test was dust (57%) followed by mites (32%) and pollen (39%).¹³ The analysis of adjusted odds ratio (aOR) is compared with study done by Sinha.¹¹ Zeynep Tamay had also analysed adjusted odds ratio (aOR) in his study.¹⁴ The eosinophil is a multifunctional leukocyte playing a central role in the mediated allergic diseases, parasitic killing and tissue repair.¹⁵ Among the noninfectious diseases associated with eosinophilia are allergic diseases, including allergic rhinitis, conjunctivitis, and asthma, eosinophils are present in involved tissues as well as often being increased in blood. [16]. Absolute eosinophil count values (AEC) was measured both before and 3 months after the intranasal corticosteroid therapy and surgery for all the study subjects receptively in the present study. The mean AEC value was reduced to 321.71 (± 53.69) 3 months after the intranasal corticosteroid therapy and surgery in this study. This observation was similar with study done by Soumya Rao and Ravi Ramalingam.¹³ Based on the results presented in the study, there is a significant increase in eosinophil count percentage in patients as compared with controls. eosinophil counts could be helpful for the diagnosis of allergic rhinitis, and all patients should be made these tests.¹⁷ The prevalence of allergic rhinitis has increased over the past decade¹⁸, and it has substantial negative effects on work productivity, cognitive performance, self-perception, and quality of life.^{19,20} As the condition is not life-threatening and does not require emergency room care or hospital admission, it is often considered by many healthcare professionals as bothersome or trivial.¹⁹ Allergic diseases also constitute an economic burden, as they affect quality of life and work life.²¹ Quality of life scores (QOL) both before and after the intranasal corticosteroid therapy and surgery was analysed in this series. The mean QOL scores was 2.621 (± 0.441) before and after the treatment. The mean QOL scores reduced to 2.029 (± 0.384) before and after the intranasal corticosteroid therapy and surgery. The analysis of Quality of life scores is compared with study done by others.¹³ The Allergic Rhinitis and its Impact on Asthma (ARIA) Initiative Workshop Expert Panel, in collaboration with the World Health Organization, proposed guidelines for the management of allergic rhinitis based on data from randomized, controlled trials.^{7,22} Recommendations include allergen avoidance,

pharmacologic treatment, specific immunotherapy, education, and surgery.^{7,22} The ARIA Workshop Expert Panel guidelines^{7,22} strongly advise allergen avoidance for people with allergic rhinitis. However, although reducing exposure to dust/dust mites, pets, and high pollen counts or staying in a controlled climate may reduce allergen exposure, avoiding allergens has limited benefit and is impractical for many patients. In the present study 46 patients showed improvement in symptoms with medical management and 14 refractory to medical management showed improvement in symptoms with surgical intervention during successive follow up. Intranasal corticosteroids are the mainstay of treatment of allergic rhinitis. They act by decreasing the influx of inflammatory cells and inhibiting the release of cytokines, thereby reducing inflammation of the nasal mucosa.²² Many studies have demonstrated that nasal corticosteroids are more effective than oral and intranasal antihistamines in the treatment of allergic rhinitis^{23,24,25}. Corticosteroids also results in quality-of-life improvements.²⁶ Many surgical options exist for the treatment of allergic rhinitis, directed primarily at the underlying nasal obstructive component. Much of the literature has focused on reduction of the inferior turbinate for symptomatic improvement in patients afflicted with allergic rhinitis. Endoscopic sinus surgery and septoplasty play little role in the management of allergic rhinitis, unless when seen in conjunction with other conditions such as rhinosinusitis.²⁷ Allergic rhinitis is a very common condition, and the surgical objective is to augment the nasal airway by primarily reducing turbinate tissue, thereby alleviating the most common complaint of nasal obstruction. The inferior turbinate has proven to be the most important contributor to nasal obstruction and dynamic compliance of the nasal cavity in allergic rhinitis patients. Various technologies and many surgical procedures exist for addressing the inferior turbinate, but no single modality has evolved as the gold standard. Therefore, it is very important for the surgeon to be familiar and facile with a number of approaches.²⁸ However, it is difficult to generalize the results of this study and therefore to know the country-wide variation in prevalence of allergic rhinitis or to understand the complex inter-relationship of different socio-demographic and environmental factors, similar studies preferably multi-centric, should be conducted in different communities.

CONCLUSION

Current recommendations of allergic rhinitis include avoidance of allergens, pharmacotherapy, immunotherapy and surgery. Management should be significant to improve the quality of life of the patients. The study

population showed improvement with medical management which includes intranasal steroid therapy. Those patients who were not responded to medical management, showed improvement with surgical intervention in the study population. Allergen avoidance was advised for all patients in this study population. The study showed improvement in the quality of life in patients with allergic rhinitis. The global warming and increase in industrialization, will affect the future prevalence of allergic rhinitis. Education of community about the increasing trends of disease, the importance of early and regular treatment to allergic rhinitis is necessary.

REFERENCE

1. International Consensus Report on the Diagnosis and Management of Rhinitis. International Rhinitis Management Working Group. *Allergy* 1994; 49(Suppl):1-34.
2. Bousquet J, Khaltaev N, Cruz AA, Denburg J, Fokkens WJ, Togias A, *et al.*; World Health Organization; GA(2)LEN; AllerGen. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA (2) LEN and AllerGen). *Allergy* 2008;63(Suppl 86):8-160
3. Bousquet J, Khaltaev N, Cruz AA, Denburg J, Fokkens WJ,
4. Togias A, *et al.* Allergic rhinitis and its impact on asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA (2) LEN and AllerGen). *Allergy* 2008;63 Suppl 86:8-160
5. Dykewicz MS, Fineman S. Executive summary of joint task force practice parameters on diagnosis and management of rhinitis. *Ann Allergy Asthma Immunol* 1998; 81(5 Pt 2):463-8
6. Gaur SN, Gupta K, Rajpal S, Singh AB, Rohtagi A. Prevalence of bronchial asthma and allergic rhinitis among urban and rural adult population of Delhi. *Indian J Allergy Asthma Immunol* 2006; 20:90-7. Bousquet J, Van Cauwenberge P, Khaltaev N; Aria Workshop Group; World Health Organization. Allergic rhinitis and its impact on asthma. *J Allergy Clin Immunol.* 2001; 108:S147-S334
7. Bruce M. Prenner, MD Allergic Rhinitis: Treatment Based on Patient Profiles *The American Journal of Medicine* (2006) 119, 230-237
8. Bousquet J, Bullinger M, Fayol C, Marquis P, Valentin B, Burtin B. Assessment of quality of life in patients with perennial allergic rhinitis with the French version of the SF-36 Health Status Questionnaire. *J Allergy Clin Immunol* 1994;94:182-8.
9. Juniper EF, Thompson AK, Ferrie PJ, Roberts JN. Validation of the standardized version of the rhino conjunctivitis quality of life questionnaire. *J Allergy Clin Immunol* 1999; 104:364-9.
10. Vandenplas O, D'Alpaos V, Van Brussel P. Rhinitis and its impact on work. *Curr Opin Allergy Clin Immunol* 2008; 8:145-9.
11. B Sinha Allergic Rhinitis: A neglected disease - A community based assessment among adults in Delhi

- Journal of Postgraduate Medicine 2015, Vol 61(3), P169-175
12. Fang Lee Lim, Asthma, Airway Symptoms and Rhinitis in Office Workers in Malaysia: Associations with House Dust Mite (HDM) Allergy, Cat Allergy and Levels of House Dust Mite Allergens in Office Dust, PLOS ONE | DOI:10.1371/journal.pone.0124905 April 29, 2015.
 13. Soumya Rao, Ravi Ramalingam. Impact of surgery and intranasal corticosteroid therapy on quality of life of patients with allergic rhinitis Indian Journal of Allergy, Asthma and Immunology | Jan-Jun 2016 • Volume 30 • Issue 1
 14. Zeynep Tamay. Dietary Habits and Prevalence of Allergic Rhinitis in 6 to 7-Year-Old Schoolchildren in Turkey Allergology International. 2014; 63:553-562.
 15. Venge P: Review article: Monitoring allergic inflammation. Allergy, 2004; 59: 26-32.
 16. Kovalszki A, Sheikh J, Weller PF. Eosinophils and Eosinophilia. In Clinical Immunology, principle and practice, 2013; 4(2): 304.
 17. Suaad A. Brakhas. study of total ige levels and eosinophil count according to age and gender in patients with allergic rhinitis wjpr, 2015; vol 4, issue 1: 295 -303
 18. Salib RJ, Drake-Lee A, Howarth PH. Allergic rhinitis: past, present and the future. Clin Otolaryngol Allied Sci. 2003;28:291-303.
 19. Fireman P. Treatment of allergic rhinitis: effect on occupation productivity and work force costs. Allergy Asthma Proc. 1997;18:63-67.
 20. Kremer B, Den Hartog HM, Jolles J. Relationship between allergic rhinitis, disturbed cognitive functions and psychological well-being. Clin Exp Allergy. 2002;32:1310-1315.
 21. B. Leynaert, C. Neukirch, R. Liard, J. Bousquet, and F. Neukirch, "Quality of life in allergic rhinitis and asthma: a population based study of young adults," The American Journal of Respiratory and Critical Care Medicine, vol. 162, no. 4, part 1, pp. 1391-1396, 2000.
 22. Bousquet J, Van Cauwenberge P, Khaltaev N; Aria Workshop Group; World Health Organization. Allergic rhinitis and its impact on asthma. J Allergy Clin Immunol. 2001;108:S147-S334.
 23. Weiner JM, Abramson MJ, Puy RM. Intranasal corticosteroids versus oral H1 receptor antagonists in allergic rhinitis: systematic review of randomized controlled trials. BMJ. 1998;317(7173):1624-1629.
 24. Yáñez A, Rodrigo GJ. Intranasal corticosteroids versus topical H1 receptor antagonists for the treatment of allergic rhinitis: a systematic review with meta-analysis. Ann Allergy Asthma Immunol. 2002; 89(5):479-484.
 25. DENISE K. SUR, MD. Treatment of Allergic Rhinitis American Family Physician. 2010; Volume 81, Number 12:1140-1446
 26. Ciprandi G, Canonica WG, Grosclaude M, Ostinelli J, Brazzola GG, Bousquet J. Effects of budesonide and fluticasone propionate in a placebo-controlled study on symptoms and quality of life in seasonal allergic rhinitis. Allergy. 2002; 57:586-591.
 27. Nipun Chhabra. Surgical options for the allergic rhinitis patient, Current opinion in otolaryngology and head and neck surgery. April 2012; 20(3):199-204
 28. Lim M Y Allergic rhinitis: evidence-based practice, Singapore Med J 2010; 51(7): 542.

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