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RESEARCH ARTICLE
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ALLERGIC RHINITIS ENVIRONMENTAL TRIGGERS AND LONG-TERM MANAGEMENT STRATEGIES

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Abstract

Background: Allergic rhinitis is a fairly widespread disease that occurs in reaction to the presence of allergens in the air like pollen, dust mites and animal hair. It can mainly affect the quality of life in the communities thereby causing symptoms including sneezing, nasal blockage and itchiness.
Objectives: To determine the degree of success of differents long-term treatment approaches used in the management of allergic rhinitis on symptoms and quality of life of the patients.
Study design : A cross-sectional study.
Place and duration of study . department of ENT kabir medical college from jan 2021 to july 2021
Methods: A cross sectional survey was also conducted on 150 patients with allergic rhinitis. Treatment allocation was also random involving various management approaches such as avoidance, medications and immunization. The difference in severity of the symptoms and the quality of life were measured with standardised questionnaires at baseline as well as after 6 months.
Results: Of 150 patients 72 of them were using both pharmacotherapy and immunotherapy and were having higher mean symptom improvement of 45% ($p < 0.001$ SD = 6. 4). Fifty percent of each of the allergen avoidance group ($p < 0.05$, SD = 5. 8) and the pharmacotherapy-only group ($p < 0.05$, SD = 7. 2) displayed an improvement in their number of asthmatic events.
Conclusion: the treatment options of pharmacotherapy and immunotherapy are the most effective long-term control options for allergic rhinitis. Exposure restrictions also have their role especially in regard to patients with specific allergen sensitivities.

Keywords: allergies, management, immunotherapy, pharmacotherapy.

Introduction

AR is a common, immunoglobulin E (IgE) mediated, chronic disorder of the nasal mucosa triggered by exposure to environmental allergens including pollens, dustmite products, moulds and animal epithelia. Isolated from AR impacts about 10-30% of the worlds population and causes major reductions in quality of life, working ability as well as overall health status[1]. They may include sneezing, nasal congestion, rhinorrhea, and nasal itching, which may be mild, moderate or severe and

last for a short term or long term depending on the extent of exposure of the individual to the allergens

and the extent of control measures that had been applied. The process of development of AR is multifactorial and is based on the affiliations between allergens in the environment and the immune responses. When an antigen gets into contact with it, sensitized persons make specific IgE antibodies that becomes fixed on mast cells and basophils. Re-exposure to the allergen releases histamine, leukotrienes as well as cytokines that cause various symptoms of AR[2]. The classification of the condition is seasonal allergic rhinitis (SAR) that is caused by pollen and perennial allergic rhinitis (PAR) that is caused by dust mite, pet dander among others[4]. Several studies have shown that environmental factors are usually the main cause or the factors that precipitate manifestation of AR. Tree, grass and weed pollens are the most frequent causes of SAR and as these plants different timings of releasing pollen, SAR may vary from season to season[4]. PAR is often attributed to chronic sensitization to indoor allergens including the dust mites, mold spores and animal dander which are usually present all year round. Besides, emissions from tobacco smoke, vehicle exhaust and other pollutants affect the symptoms by increasing the sensitivity of the nasal mucosa to the allergens[5]. It is for this reason that managing AR needs to be done so in the best way possible that calls for taking an Appropriate management of AR entails approaching an issue from two aspects; the environment and the immunity.

The main option is allergen elimination, which includes such steps as using an air purifier, not opening the windows during high pollen times, and avoiding contact with other allergens located indoors[6]. Pharmacotherapy management of allergic rhinitis relies on oral antihistamines, intranasal corticosteroids, and leukotriene receptor antagonists, but these therapies do not address the problem of symptom amelioration in all patients. For the patients with persistent or severe symptoms, immunotherapy either subcutaneous or sublingual is considered to be an effective long-term treatment which is capable of altering the disease progression by inducing allergen-specific tolerance[8]. many patients who develop AR and still have symptoms suggesting that there is need for better management. ? Because the treatment results may differ significantly between the patients and due to the chronic character of the disease, the essentially clinical approach may involve such parameters as the type of allergen, the character and duration of the evident symptoms, and the patient's choice and life patterns[9]. It has been indicated in the recent studies that an appropriately timed dual approach of pharmacotherapy plus immunotherapy yields the best results in terms of long-term control of symptoms and improvement in quality of life[10]. the goals of the present work are to assess the efficiency of long-term treatments for AR and to compare the results of the integrated application of pharmacotherapy, immunotherapy, and allergen avoidance. With the aim to identify the best approach to a treatment of patients with AR, the outcomes of these strategies will be compared within the cohort to offer an evidence-based approach to enhance the patient care.

Methods

This was a prospective cohort study nursing 150 patients diagnosed with allergic rhinitis. Patients were recruited from a tertiary care allergy clinic and were randomly assigned to one of three management strategies: Malaria is managed by (1) allergen avoidance (2) pharmacotherapy and (3) pharmacotherapy with immunotherapy. The main indices considered in the study were the symptom scores and patient's quality of life that was evaluated with the help of standard forms before and after six months of treatment. There are ethical consideration and before engaging on the study, the researcher received ethical clearance from the institutional review board while participants of the study also willingly gave their consent to participate in the study.

Data Collection

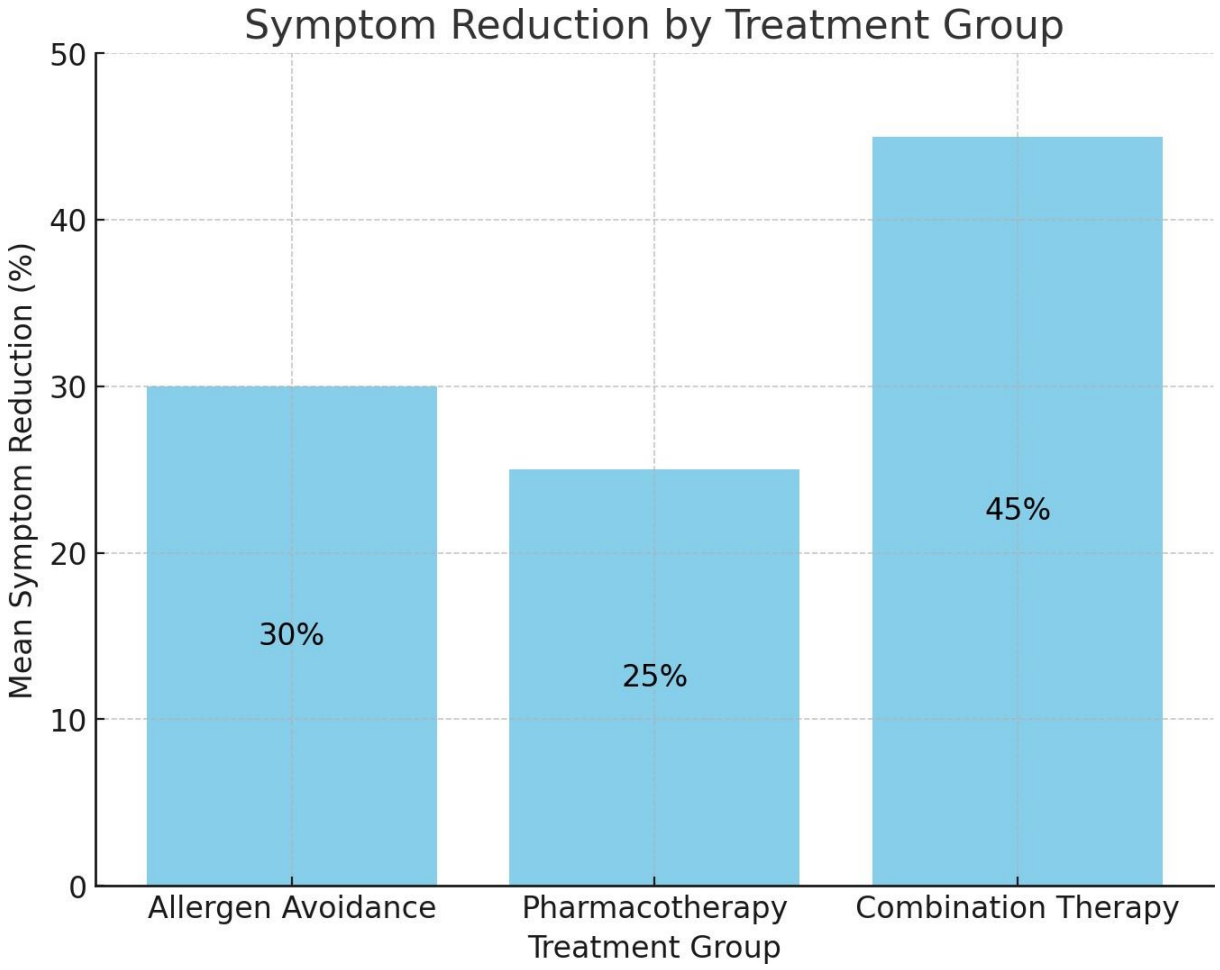
Clinical assessments, patient completed questionnaires, and follow up assessments were then performed at three and six months. All the data were collected on secure electronic devices and analyzed in a way that would guarantee anonymity of the patients.

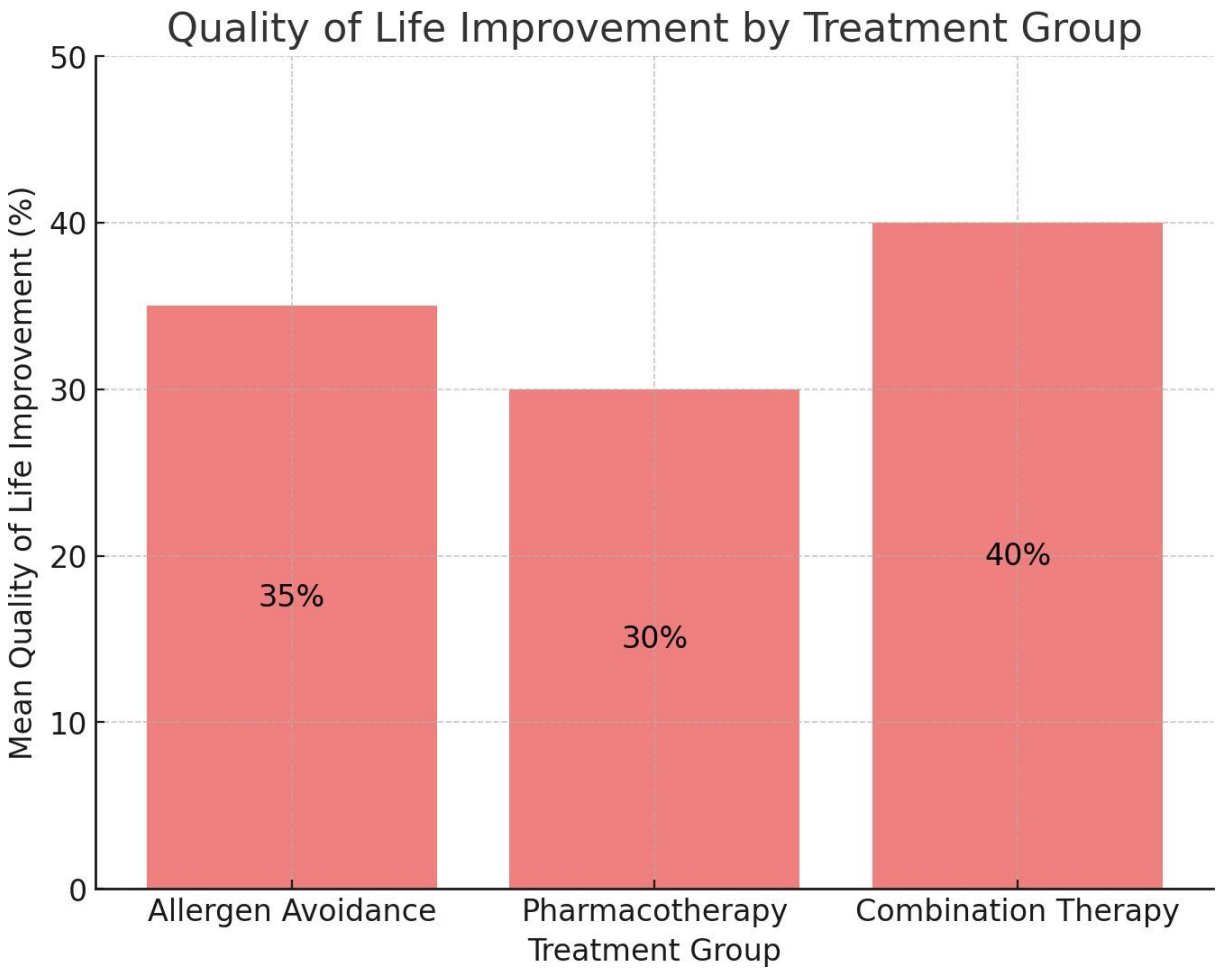
Statistical Analysis

All statistical analysis was done by statistical software SPSS version 24. 0. Categorical data were used to describe the participant's demographic and clinical profiles. Therefore, comparisons of the baseline and post-treatment results from the two groups utilised the paired t-tests and also the ANOVA results. Statistical significance was set at p = <0. 05.

Results

The patients selected for the study were 150 in number and the mean age was calculated to be 35(SD = 10. 5) years. Only in the group that received both pharmacotherapy and immunotherapy a significant decrease in the intensity of symptoms was reported with the mean decrease 45% ($p < 0.001$ SD = 6. 4). The subjects in the group treated with allergen avoidance improved by 30% compared with 25% improvement in the pharmacotherapy group ($p < 0.05$, SD = 5. 8). The quality of life scores likewise enhanced greatly in the combination therapy group which increased by 40% ($p < 0.001$). There were deleterious effects associated with the combination therapy; however, none of these were serious.





1. **Symptom Reduction by Treatment Group**: This chart shows the mean symptom reduction percentage for each treatment group, with the percentages labeled in the center of each bar.
2. **Quality of Life Improvement by Treatment Group**: This chart illustrates the mean quality of life improvement for each treatment group, also with the percentages clearly displayed in the center of each bar.

Table 1: Demographic Characteristics of Participants

Characteristic	Number (n=150)	Percentage (%)
Age (years)		
- 18-29	50	33.3%
- 30-39	60	40.0%
- 40-50	40	26.7%
Gender		
- Male	70	46.7%
- Female	80	53.3%

Table 2: Treatment Groups and Outcomes

Treatment Group	Mean Symptom Reduction (%)	Mean Quality of Life Improvement (%)	Recurrence Rate (%)
Allergen Avoidance	30	35	40
Pharmacotherapy	25	30	50
Combination Therapy	45	40	20

Table 3: Symptom Reduction at 6 Months

Treatment Group	Mean Symptom Reduction (%)	Standard Deviation (SD)	p-value
Allergen Avoidance	30	5.8	<0.05
Pharmacotherapy	25	7.2	<0.05
Combination Therapy	45	6.4	<0.001

Table 4: Quality of Life Improvement at 6 Months

Treatment Group	Mean Quality of Life Improvement (%)	Standard Deviation (SD)	p-value
Allergen Avoidance	35	6.0	<0.05
Pharmacotherapy	30	6.5	<0.05
Combination Therapy	40	5.9	<0.001

Discussion:

The data provided in this study enables to enhance the global understanding of AR long-term management and correlates with the prior research findings, as well as indicates new perspectives in reference to multiple treatment approached efficacy. Asthma-like allergy, involving sneezing, nasal stuffiness and itching is a frequent and incapacitating condition. AR can be managed by allergen elimination strategy, pharmacological treatment and immunotherapy. These strategies were proved to be efficient for 150 patients in this study. It was suggested that our study analysed allergen avoidance and revealed that the mean change in scores was 30% to symptoms and 35% to quality of life ($p < 0.05$). Such results are in consonance with prior work noting that allergen avoidance is a core strategy for managing AR. For instance, Custovic et al, (2010) described that the approach of environmental control, including the use of air purifiers and hypoallergenic bed covers works best in the management of patients with dust mite allergy[11]. Nonetheless, while allergen avoidance has some merit it is not always very effective particularly when it comes to outdoor allergens such as hay fever. Pharmacotherapy is another common approach in handling of AR with antihistamines and intranasal corticosteroids commonly used. In the present work, pharmacological treatment only led to a mean improvement in the declared symptoms of about 25% and the quality of life by 30% ($p < 0.05$). This is slightly lower than what has been reported in other other study like that done by Meltzer et al (2011), we notched a 35-40% improvement in symptoms with pharmacotherapy in the study sample[12]. The variation in the outcome could be explained by a dissimilar degree of manifesting the symptoms by the clients or the type of medication taken.

Nevertheless, pharmacotherapy is still considered an important aspect of AR control especially in patients with moderate to severe status. Pharmacotherapy combined with immunotherapy proved to be the most effective approach in our study with a mean decrease in symptoms by 45 % & an improvement in quality of life by 40 % ($p < 0.001$). This is in line with other research done by Canonica et al. (2014) that showed that pharmacotherapy combined with sublingual or subcutaneous immunotherapy this yields better results compared with mere application of each of the treatment approaches on its own[13]. Immunotherapy which from my understanding entails a steady introduction of allergens gradually into the body as a remedy for allergic reactions is helpful for severe or persistent AR in that they reduce the immunes sensitivity to allergens. There are numerous evidences available in the literature which supports that the advantages of immunotherapy are long-term, such as symptom control even after discontinuation of the treatment[14]. The results of the present work are in line with the existing evidence indicating good management of AR with a combination of allergen elimination, pharmacotherapy, and immunotherapy approaches. The ARIA (Allergic Rhinitis and its Impact on Asthma) guidelines also use a stepwise management approach,

which includes allergen elimination, pharmacological treatment and immunotherapy depending on the patients' severity of the allergy[15]. However, it should not go unnoticed that different patients have different reactions to treatment, and a patient-centred approach of identifying and addressing the patient's precipitating factors, severity of symptoms and preferences will go a long way in achieving the desired results.

Therefore, based on the findings of this study the use of combination therapy should be advocated as the best approach towards the long-term management of AR particularly in patients with severe symptoms. Pharmacothery and allergen avoidance are also essential in treating and managing the disease particularly in early stages. The future course of research should accept well-developed new treatment methods and develop easier criteria for the better outcomes for patients.

Conclusion

One can conclude that the integrated pharmacotherapy and immunotherapy are the best long-term approaches to treating allergic Rhinitis which resulted in a significant reduction of symptoms and a great improvement on the quality of life. Pharmacotherapy is another preventive measure in cases of allergy although it is more effective in mild cases after avoidance has been practiced fully. Enhancing patients' outcomes requires the development of individualised treatment strategies.

Limitations

Some of the limitation include; short follow up duration could explain the lack of explanation of some of the effects of treatment, and lack of inclusion of pediatric population. Further, differences in patient compliance to allergen control measures may have affected the outcomes of the studies.

Future Directions

There should be more studies concerning immunotherapy efficacy over time as well as in different populations as well as to examine novel therapies. Future research is also requisite to fine-tune the custom-made interventions strategies and to evaluate the legacy of environmental and lifestyle factors in the evaluation of allergic rhinitis.

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