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Original Research Article

A study on therapeutic management of allergic conjunctivitis and assessment of quality of life in patients

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ABSTRACT

Background: Allergic conjunctivitis (AC) is a common ocular condition triggered by exposure to allergens. The primary objective of this study was to evaluate the therapeutic management of patients suffering from allergic conjunctivitis and to determine the prevalence of AC among patients attending an allergy center.
Methods: A retro-prospective, interventional study was conducted, for a six-month period from March to August 2024. Total of 260 patients diagnosed with AC were included from total of 1,523 individuals attending the center. Inclusion criteria focused on patients of all ages undergoing treatment for AC, excluding those with infectious conjunctivitis or other ocular pathologies. Patient data were collected using structured forms that included demographic information, presenting symptoms, other allergic conditions etc. Treatments were categorized into pharmacological, personalized and supportive therapy.
Results: Among all the 1,523 patients, 263 were diagnosed with AC, indicating a prevalence of 17.26%. Allergen testing revealed that dust mites were the leading triggers, followed by pollens. Coexisting allergic conditions were highly prevalent, particularly allergic rhinitis and dermatitis. Pharmacological therapy, like antihistamines and topical corticosteroids, was administered to 86 patients, while 105 patients received personalized treatments. A statistically significant improvement in post-treatment symptom scores was observed, with an effect size of 1.62, indicating high treatment efficacy.
Conclusions: This study highlights the need for early diagnosis, comprehensive allergen evaluation and targeted management in allergic conjunctivitis. The study contributes to the scientific understanding of AC by providing real-world data on allergen prevalence and treatment outcomes.

Keywords: Allergic conjunctivitis, Antihistamines, Supportive therapy, Topical corticosteroids

INTRODUCTION

Allergic conjunctivitis, commonly referred to as "red eye," is an inflammation of the conjunctiva, which is the clear tissue lining the white part of the eyes and the inside of the eyelids. This condition arises due to allergens present in the environment, including pollens, house dust mites, pet dander, insect allergens and certain foods. Allergic conjunctivitis is usually self-diagnosed and self-treating, although in severe cases, it can persist for months or even years. Pollens are considered the most common allergens, particularly during certain seasons when they are prevalent

in the air.[1] Other significant allergens include both indoor and outdoor substances, such as mold spores and pet dander, which are capable of triggering symptoms. In some individuals, specific foods may also cause allergic reactions, further complicating the condition.

The symptoms of allergic conjunctivitis vary in severity but are usually quite characteristic. They include redness of the eyes, itching, excessive tearing or watery eyes, burning sensations, swelling of the eyelids, sensitivity to light and puffy or swollen eyes. These symptoms often appear rapidly after exposure to allergens and can be quite bothersome, significantly impacting daily activities and quality of life.[11] The condition is often linked to seasonal allergic rhinitis or hay fever, as both share common triggers and symptoms. While mild cases can resolve on their own with basic management, more severe or chronic cases require medical attention to prevent complications.

Diagnosing allergic conjunctivitis involves a thorough assessment of the patient's medical history and clinical symptoms, along with specialized tests to identify the offending allergens. Physicians begin by examining the eyes for visible signs of redness, swelling and discharge. For more definitive identification of allergens, an Allergen Skin-Prick Test is often conducted.[13] This test involves applying small drops of allergen solutions to the patient's forearm or back and using a sterile lancet to prick the skin at the designated areas. After 20 to 25 minutes, the areas are observed for any inflammatory reactions, such as redness or swelling, which indicate hypersensitivity to the specific allergens.

Other diagnostic methods include the specific IgE blood test, which measures the levels of IgE antibodies produced in response to particular allergens and the Conjunctival Provocation Test, wherein suspected allergens are applied directly to the conjunctiva under controlled conditions to observe any allergic response.[3] The Patch Test is another method used, particularly for diagnosing delayed hypersensitivity reactions and involves placing allergen-coated patches on the skin for an extended period to monitor reactions.[14]

Treatment for allergic conjunctivitis is categorized into non-pharmacological and pharmacological measures, with the primary aim being symptom relief, prevention of complications and improving the patient's overall quality of life. Non-pharmacological treatments focus on lifestyle modifications and symptomatic relief. Identifying and avoiding known allergens is a critical first step.[15]

Maintaining good hygiene, such as frequently washing hands and refraining from rubbing the eyes, helps reduce exposure and prevents exacerbation of symptoms. Artificial tears are often recommended to flush out allergens and soothe the eyes. Applying cold compresses is another effective method to alleviate swelling, redness and itching. Additionally, patients are advised to avoid expired or contaminated eye products and cosmetics that could potentially irritate the eyes.[4] Pharmacological treatments provide more targeted relief, especially in moderate to severe cases. Antihistamines, such as oral cetirizine and loratadine, are commonly prescribed to address itching and other allergic symptoms. For localized treatment, topical antihistamine eye drops, such as ketotifen, are effective, especially in managing severe eye inflammation.

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), like ketorolac, may be used to manage pain and inflammation. Topical Corticosteroids are reserved for short-term use in severe cases where rapid symptom control is necessary, but their prolonged use is avoided due to potential side effects.[5] For patients with chronic and severe allergic conjunctivitis, Topical Cyclosporins, such as cyclosporine A, offer immunomodulatory benefits, reducing inflammation and stabilizing the immune response.

In cases where conventional treatments are insufficient, advanced therapies like sublingual immunotherapy (SLIT) are considered. SLIT is an innovative approach primarily used for patients who have undergone allergen identification through the allergen skin-prick test. This therapy involves administering small, controlled doses of the specific allergen sublingually, either in liquid or tablet form. By exposing the immune system to these controlled doses, SLIT helps the body develop tolerance to the allergen, reducing the severity of allergic reactions over time.[6] This therapy is particularly useful for managing chronic or severe allergic conjunctivitis caused by allergens like pollens or dust mites.[7] It not only enhances the immune system's response but also offers a long-term solution to allergen sensitivity.

Allergic conjunctivitis, though not life-threatening, can significantly impact a patient's comfort and productivity, particularly during periods of high allergen exposure. Early diagnosis and management are crucial to prevent complications and improve outcomes. A combination of preventive measures, symptom-focused treatments and advanced therapies like SLIT can help patients effectively manage the condition. With proper care, individuals with allergic conjunctivitis can experience substantial relief and lead a normal, allergy-free life.[8]

The main aim was to study the therapeutic management of patients who are suffering from allergic conjunctivitis. The primary objective of this study is to analyse the therapeutic management of patients suffering from allergic conjunctivitis. It aims to determine the prevalence of allergic conjunctivitis among patients visiting the Bengaluru allergy centre and assess its impact on their quality of life. Additionally, the study seeks to identify the proportion of cases with coexisting allergic conditions, such as allergic rhinitis (AR), allergic dermatitis (AD), allergic nasal bronchitis (ANB) and allergic urticaria (URA). It also focuses on observing and documenting the symptoms experienced by patients with allergic

conjunctivitis and identifying the most affected age group and gender among them.

METHODS

Study design and participants selection

This was a retro-prospective, interventional study that include 260 patients for a period of 6 months between March, 2024 to August, 2024 at Bengaluru Allergic Centre, Jayanagar, Bengaluru, Karnataka. The study was approved by Kshema Independent Ethics Committee. The 2 case files from the Bengaluru Allergy Centre (BAC) provided detailed information about the patients' symptom patterns and the overall percentage of patients undergoing treatment.

Data was meticulously collected from patient case files using a self-validated and carefully designed data collection form. This form included details on demographics, current complaints, past medical and medication history, social and occupational habits, laboratory results from allergy skin prick tests, allergen information, SLIT (sublingual immunotherapy) treatment data, other prescribed pharmaceutical treatments and monitoring parameters.

Paired T-test was performed on the data collected from rhinoconjunctivitis quality of life questionnaire (RQLQ) after patients had undergone a minimum of 3 months of sublingual immunotherapy (SLIT) treatment. The questionnaire comprehensively assessed eight domains, including sleep, non-hay fever symptoms, practical problems, nasal and eye symptoms, activity limitations due to eye, nose or ear issues, emotional well-being and sinus problems.

Data collected includes patient of all age group and genders, also patients who are diagnosed with allergic conjunctivitis and those who are undergoing treatment of allergic conjunctivitis. But the study excludes the patients with infectious conjunctivitis and patients who were terminally ill and those who are pregnant.

Statistical analysis

The data from 260 patients was divided into two groups, representing scores before and after therapy, which followed patient counselling and pharmacological interventions. Paired T-test was done and the Standard deviation, pooled standard deviation, p values and t-values were calculated to evaluate the study's significance level.

Cohen's d value was then determined to quantify the effect size. This analysis highlighted significant differences between the two data sets, demonstrating the effectiveness of SLIT in reducing symptom severity in patients with allergic conjunctivitis (AC).

RESULTS

17.07% of the 1523 patients that attended the Bengaluru allergy center (BAC) were estimated to be research participants or the prevalence of the study founded to be 17.07%. Males comprised 65% of all patients that attended the facility, with females making up the remaining 35%. Furthermore, the age range of 11 to 20 years was shown to be the most usually impacted, suggesting that those under the age of 31 were more likely to experience the symptoms of allergic conjunctivitis.

A total of 260 patients were diagnosed with various conditions, with 40.30% being allergic conjunctivitis (AC). Other conditions included allergic rhinitis (34.60%), allergic nasal bronchitis (15.70%), allergy dermatitis (5.30%) and allergic urticaria (3.80%). The majority of patients had both AC and URA, indicating a diverse range of conditions.

When it comes to the eye symptoms itching were highly observed in patients (88.50%) followed by redness (84.20%) and watery eyes (74.20%).

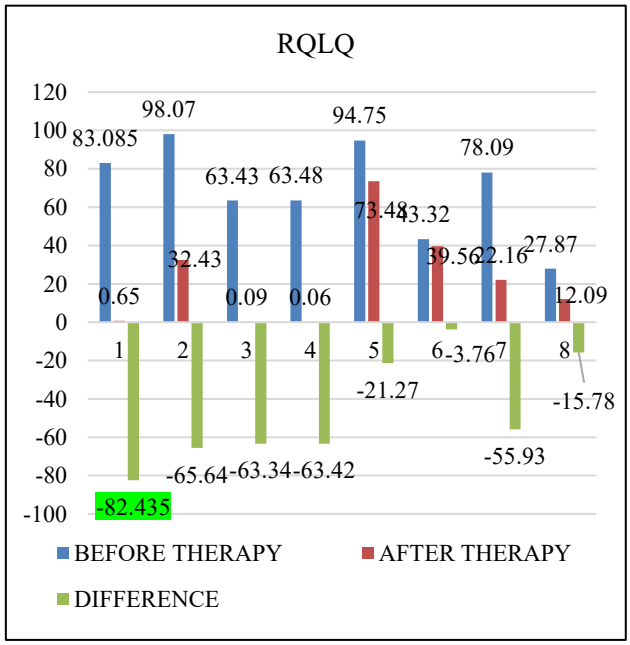

Figure 1: Result interpreted by paired T- test from the data collected from RQLQ questionnaire of pre- and post-treatment results.

The allergens mainly responsible for AC were found to be house dust mites (60.30%), followed by pollens (23%) and insects (18.10%). In the house dust mite category, the primary allergens were der farinae (96.80%) and der pteromyssinus (94.30%).

All the patients diagnose with AC has undergone SLIT therapy (sublingual immunotherapy) after a skin-prick test. Among these, 84% received SLIT once daily (SLIT-OD), while 16.15% received SLIT twice daily (SLIT-BD). Of all

patients, 95.38% were also treated with antihistamines, 32% received topical corticosteroids and 23.46% were given artificial tears. All 260 patients (100%) received supportive therapy.

Among all the individual who visited the center people of age group 21-60 visited the most i.e., 51.15% with male the highest (65%). Most of them were students (44.23) followed by working individuals (49.61).

Table 1: Classification based on allergic conjunctivitis diagnosis and their co-morbidities.

S. no.	Diagnosis	No. of the patients	%
1	Allergic conjunctivitis (AC)	105	40.30
2	Allergic conjunctivitis+allergic rhino conjunctivitis (AC+ARC)	90	34.60
3	Allergic conjunctivitis+allergic nasal bronchitis (AC+ANB)	41	15.70
4	Allergic conjunctivitis+allergic dermatitis (AC+AD)	14	5.30
5	Allergic conjunctivitis+allergic urticaria (AC+URA)	10	3.80

Table 2: Distribution based on allergic conjunctivitis symptoms.

S. no.	Symptoms	No. of the patients	%
1	Redness	219	84.20
2	Watery eyes	193	74.20
3	Itching	230	88.50
4	Abnormal sensation in the eye	56	21.50
5	Dryness	12	4.60
6	Eyelid swelling	71	27.30
7	Eye pain	1	0.40
8	Blurred vision	1	0.40

Table 3: Distribution of allergens causing allergic conjunctivitis.

S. no.	Allergens	No. of the patients	%
1	Pollen	59	23
2	House dust mites	157	60.30
3	Insects	47	18.10

Table 4: Distribution of treatment given to the allergic conjunctivitis patients.

S. no.	Treatment	No. of the patients	%
1	Slit-sublingual immunotherapy	260	100
	Slit- OD	218	84
	Slit- BD	42	16.15
2	Antihistamines	248	95.38
3	Topical corticosteroides	83	32
4	Artificial tears	61	23.46
5	Supportive therapy	260	100

Table 5: Result interpreted by paired T-test from the data collected from Rhino conjunctivitis quality of life questionnaire (RQLQ) of pre and post-treatment results.

S. no.	Domains	RQLQ (before treatment)	RQLQ (after treatment)	Difference
1.	Sleep	83.085	0.65	-82.435
2.	Non-hay fever symptoms	98.07	32.43	-65.64
3.	Practical problems	63.43	0.09	-63.34
4.	Nasal problems	63.48	0.06	-63.42
5.	Practical Symptoms	94.75	73.48	-21.27
6.	Limited activities	43.32	39.56	-3.76
7.	Emotional	78.09	22.16	-55.93
8.	Sinus symptoms	27.87	12.09	-15.78

Table 6: Demographic characteristics of the study population (n=260).

Variable	Category	Number of patients (N)	%
Age group (in years)	0–10	52	20.00
	11–20	63	24.23
	21–60	133	51.15
	>60	12	4.61
Gender	Male	169	65.00
	Female	91	35.00
Occupation	Working	129	49.61
	Student	115	44.23
	Domestic Spouse	16	6.15

DISCUSSION

In the 1523 patients who visited the Bengaluru Allergy Centre (BAC), the prevalence of allergic conjunctivitis (AC) was 17.00%. House dust mites (60.30%) were the allergens most responsible for AC, followed by pollens (23%), insects (18.10%). Der. pteromyssinus (94.30%) and Der. farinae (96.80%) were the main allergens in the category of home dust mites. The distribution of allergens responsible for allergic conjunctivitis showed a standard deviation of approximately 18.86%, indicating a moderate spread in allergen prevalence among dust mites, pollens and insects. Which is similar to the findings of Kosriukvongs P et al.[2]

A total of 260 patients were diagnosed with various conditions, with 40.30% being allergic conjunctivitis (AC). Other conditions included allergic rhinitis (34.60%), allergic nasal bronchitis (15.70%), allergy dermatitis (5.30%) and allergic urticaria (3.80%). The majority of patients had both AC and URA, indicating a diverse range of conditions. In this group of patients, 40.30% solely had allergic conjunctivitis, 34.60% also had allergic rhinitis, 15.70% also had allergic nasal bronchitis and 5.30% also had allergic dermatitis.[10]

Watery eyes (74.20%), redness (84.20%) and itching (88.50%) were the most frequently reported symptoms of AC. The standard deviation of the symptom percentages among patients with allergic conjunctivitis is approximately ±38.40%, indicating a wide variation in the frequency of reported symptoms which lined up with information found in Kausar A et al, study.[9]

The allergens mainly responsible for AC were found to be house dust mites (60.30%), followed by pollens (23%) and insects (18.10%). The number of patients affected by different allergens showed a standard deviation of approximately ±60.34, indicating a notable variation in allergen exposure among the patient group. In the house dust mite category, the primary allergens were der. farinae (96.80%) and der. pteromyssinus (94.30%). A study conducted by Bielory L et al, also shows similar findings to our study, i.e. every individual suffering with AC underwent skin prick testing and then sublingual immunotherapy (SLIT).[12] Out of them, 84% took SLIT once a day (SLIT-OD) and 16.15% took SLIT twice a day (SLIT-BD). Of the total patients, 23.46% were given artificial tears, 32% were given topical corticosteroids and 95.38% were additionally treated with antihistamines. 100% of the 260 patients got supportive treatment which also been discussed in the study Bielory et al.[12]

By comparing pre- and post-treatment data, this study evaluated the effect of therapy on Rhinoconjunctivitis Quality-of-Life Questionnaire (RQLQ) ratings. A considerable impact size (Cohen's d=1.62), together with a statistically significant improvement in posttreatment ratings (p-value=0.0025) were found in the research. These findings suggest that the course of therapy significantly improved the quality of life for those with allergic conjunctivitis.[8]

While this study sheds light on allergic conjunctivitis in Bengaluru, more investigation is necessary to determine the long-term effects of the illness and the efficacy of different treatment approaches. Improving the quality of life for patients with allergic conjunctivitis requires a fuller understanding of the condition's prevalence, risk factors and management techniques.

The limitations faced was firstly, a language barrier existed between the healthcare providers and some patients, which may have affected the accuracy of symptom reporting and understanding of treatment instructions, especially in the pediatric and geriatric populations. Secondly, the therapeutic management included personalized medication regimens tailored to individual patient needs and comorbidities, which may limit the generalizability of the findings.

Additionally, patient counselling regarding the timing of drug administration and the correct sublingual technique was variable in effectiveness across different age groups and literacy levels. Furthermore, the study was conducted at a single center with a limited sample size, which may not reflect broader population dynamics. Future studies involving multicentric designs and standardized treatment

protocols are recommended to validate and extend these findings.

CONCLUSION

This study underscores the clinical burden and multifactorial complexity of allergic conjunctivitis (AC), a condition frequently coexisting with other atopic disorders such as allergic rhinitis, dermatitis and urticaria. The findings emphasize that accurate allergen identification particularly of predominant triggers like dust mites is critical for tailoring effective therapeutic strategies. Notably, the integration of pharmacological treatments with personalized interventions such as sublingual immunotherapy (SLIT) resulted in significant symptomatic improvement, demonstrating the value of individualized, multi-modal care in optimizing patient outcomes.

The observed prevalence of AC in a specialized allergy care setting, alongside the high rate of comorbid allergic conditions, highlights the need for early recognition and comprehensive management. This study advocates for the routine inclusion of allergen testing and immunomodulatory therapies in clinical protocols to improve diagnostic precision and therapeutic success.

By providing real-world data on therapeutic efficacy and allergen profiles in AC, this research contributes valuable insights toward the development of evidence-based, patient-centered approaches in ocular allergy care. Future multicentric and longitudinal studies are warranted to validate these findings across broader populations and healthcare settings, ultimately guiding best practices in the management of allergic conjunctivitis.

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REFERENCES

1. Palmares J, Delgado L, Cidade M, Quadrado MJ, Filipe HP. Allergic conjunctivitis: a national cross-sectional study of clinical characteristics and quality of life. European J Ophthalmol. 2010;20(2):257-64.
2. Kosrirukvongs P, Visitsunthorn N, Vichyanond P, Bunnag C. Allergic conjunctivitis. Asian Pacif J Aller Immunol. 2001;19(4):237.
3. Bielory L, Meltzer EO, Nichols KK, Melton R, Thomas RK, Bartlett JD. An algorithm for the management of allergic conjunctivitis. InAller Asth Proceed. 2013;34(5):408-20.
4. Del Cuvillo A, Sastre J, Montoro J, Jáuregui I, Dávila I, Ferrer M, et al. Allergic conjunctivitis and H. J Investig Allergol Clin Immunol. 2009;19(1):11-8.
5. Baig R, Ali AW, Ali T, Ali A, Shah MN, Sarfaraz A, et al. Prevalence of allergic conjunctivitis in school children of Karachi. J Pakistan Med Assoc. 2010;60(5):371.
6. Bielory L. Allergic conjunctivitis and the impact of allergic rhinitis. Curr Aller Asthama Rep. 2010;10:122-34.
7. Figus M, Fogagnolo P, Lazzeri S, Capizzi F, Romagnoli M, Canovetti A, et al. Treatment of allergic conjunctivitis: results of a 1- month, single-masked randomized study. European J Ophthalmol. 2010;20(5):811-8.
8. Parys W, Blockhuys S, Janssens M. New trends in the treatment of allergic conjunctivitis. Docum Ophthalmolog. 1992;82:353-60.
9. Kausar A, Akhtar N, Akbar N. Epidemiological Aspects of Allergic Conjunctivitis. J Ayub Medical College Abbottabad-Pakistan. 2022;1;34(1):869.
10. Memariani H, Memariani M, Ghasemian A. Quercetin as a Promising Antiprotozoan Phytochemical: Current Knowledge and Future Research Avenues. BioMed Res Int. 2024;29;264.
11. Belfort R, Marbeck P, Hsu CC, Freitas D. Epidemiological study of 134 subjects with allergic conjunctivitis. Acta Ophthalmologica Scandinavica. 2000;78:38-40.
12. Bielory L, Delgado L, Katelaris CH, Leonardi A, Rosario N, Vichyanoud P. ICON: diagnosis and management of allergic conjunctivitis. Ann Aller, Asthma Immunol. 2020;124(2):118-34.
13. Vazirani J, Shukla S, Chhawchharia R, Sahu S, Gokhale N, Basu S. Allergic conjunctivitis in children: current understanding and future perspectives. Current Opin Aller Clin Immunol. 2020;20(5):507-15.
14. Kuruvilla M, Kalangara J, Lee FE. Neuropathic pain and itch mechanisms underlying allergic conjunctivitis. J Investig Allergol Clin Immunol. 2019;29(5):349-56.
15. Ridolo E, Montagni M, Caminati M, Senna G, Incorvaia C, Canonica GW. Emerging drugs for allergic conjunctivitis. Expert Opinion on Emerging Drugs. 2014;19(2):291-302.

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