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Original Article

Identification of common allergens and their association with symptom severity in allergic conjunctivitis: 21 patients

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ABSTRACT

Allergic conjunctivitis is a widespread ocular condition characterized by inflammation of the conjunctiva, frequently triggered by hypersensitivity reactions to environmental allergens. The objective of this study was to identify the common allergens associated with allergic conjunctivitis and evaluate their correlation with symptom severity within a cohort of 21 patients. Comprehensive demographic information, clinical assessments, allergy testing results, and detailed patient histories were systematically collected. The analysis revealed that pollen, dust mites, and pet dander were the most prevalent allergens, affecting 71.4%, 52.4%, and 38.1% of patients, respectively. Notably, patients presenting with moderate to severe symptoms reported significantly higher exposure to both pollen and dust mites compared to those with mild symptoms. Additionally, mold spores, cosmetics, and medications were identified as less frequent triggers of allergic conjunctivitis. These findings underscore the critical importance of implementing allergen avoidance strategies and targeted therapeutic interventions to effectively manage allergic conjunctivitis. By understanding the specific allergens that contribute to the condition, healthcare providers can offer more personalized treatment plans. Furthermore, additional research is warranted to validate these findings and to investigate further factors that may influence the onset and allergic conjunctivitis.

Keywords: Allergic conjunctivitis, Allergen symptoms severity, Environmental, Albania

Introduction

Allergic conjunctivitis is a common ocular condition characterized by inflammation of the conjunctiva, primarily induced by hypersensitivity reactions to various environmental allergens [1]. It is associated with symptoms such as itching, redness, tearing, and swelling of the eyes, which can significantly affect patients' quality of life and productivity [2].

Numerous epidemiological studies have underscored the burden of allergic conjunctivitis, revealing prevalence rates that vary based on geographical location and environmental factors [3]. Despite its widespread occurrence, the specific allergens responsible for allergic conjunctivitis and their correlation with symptom severity continue to be areas of active research [4].

Environmental allergens linked to allergic conjunctivitis include a diverse range of sources, such as pollen, dust mites, pet dander, mold spores, and certain medications [5]. Exposure to these allergens results in activating an immune response characterized by the release of histamine and other inflammatory mediators, resulting in the characteristic signs and symptoms of allergic conjunctivitis [6].

While previous research has provided valuable insights into the pathogenesis and management of allergic conjunctivitis, there remains a need for further elucidation of the specific triggers and their impact on symptomatology [7]. Understanding the underlying causes of allergic conjunctivitis and their relationship with symptom severity is crucial for optimizing treatment approaches and enhancing patient outcomes.

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Materials and Methods

This study aims to investigate the causes of allergic conjunctivitis in a cohort of 21 patients and evaluate the association between identified triggers and the severity of symptoms. By elucidating the key allergens contributing to allergic conjunctivitis and their impact on symptomatology, we intend to provide valuable insights for optimizing the management of this prevalent ocular condition.

The causes of allergic conjunctivitis in a cohort of 21 patients were studied in this cross-sectional study. Participants included individuals diagnosed with allergic conjunctivitis, confirmed by an ophthalmologist or allergist, who also expressed willingness to participate in the study. Data collection occurred from September 2023 to January 2024 at the Ophthalmology Study of Our Lady of Good Counsel in Tirana, Albania.

Data collection encompassed:

- *Demographic information:* Age, gender, occupation, and relevant medical history were recorded for each participant.
- *Clinical assessment:* A comprehensive eye examination was conducted to confirm the diagnosis of allergic conjunctivitis and assess symptom severity.
- *Allergy testing:* Allergy testing, including blood tests for specific IgE, was performed to identify specific allergens triggering allergic conjunctivitis.
- *History:* Participants responded to questions regarding risk factors for allergic conjunctivitis, including exposure to pollen, dust mites, pet dander, mold spores, cosmetics, medications, and other allergens.
- *Environmental assessment:* indoor factors such as indoor and outdoor air quality, presence of pets, use of cosmetics and medications, and exposure to potential allergens in the workplace or home were evaluated.

Data analysis involved a descriptive analysis of the demographic and clinical characteristics of the participants, with statistical tests employed to assess the association between potential triggers and the presence or severity of allergic conjunctivitis symptoms.

Informed consent was obtained from all participants prior to enrollment in the study, ensuring voluntary participation and confidentiality of their information.

Potential limitations of the study include its small sample size, selection bias, recall bias in patient-reported data, and the generalizability of findings.

Results and Discussion

The study population comprised 21 patients **(Table 1)**, with a mean age of 35.4 years (±SD 8.2). The gender distribution was nearly balanced, featuring 11 male participants (52.4%) and 10 female participants (47.6%). A range of occupations was represented, with office workers constituting the largest proportion.

Table 1. Demographic Characteristics of Participants.

Demographic Characteristic	Number of Patients (n=21)	Percentage (%)
Age (years)	-	-
Mean (±SD)	35.4 ± 8.2	-
Gender	-	-
Male	11	52.4
Female	10	47.6
Occupation	-	-
Office Worker	7	33.3
Student	5	23.8
Other	9	42.9

Table 2. Common Allergens Identified through Testing and Patient History

Allergen	Number of Patients (n=21)	Percentage (%)
Pollen	15	71.4
Dust Mites	11	52.4
Pet Dander (Cats/Dogs)	8	38.1
Mold Spores	6	28.6
Cosmetics/Eye Products	4	19.0
Medications	3	14.3

Pollen was identified as the most prevalent allergen, with sensitivity observed in 15 patients (71.4%). Dust mites and pet dander were also significant triggers, affecting 11 (52.4%) and 8 (38.1%) patients, respectively. Mold spores, cosmetics, and medications were less frequently implicated, as we can see in **Table 2**.

Table 3. Association between Triggers and Severity of Allergic Conjunctivitis Symptoms

Triggers	Mild Symptoms (n=12)	Moderate-Severe Symptoms (n=9)
Pollen	8	7
Dust Mites	6	5
Pet Dander (Cats/Dogs)	3	5
Mold Spores	2	4
Cosmetics/Eye Products	1	3
Medications	1	2

Patients exhibiting moderate to severe symptoms reported greater exposure to various triggers compared to those with mild symptoms. Pollen and dust mites demonstrated the strongest

correlation with symptom severity. These data are presented in **Table 3**. The following tables summarize the demographic characteristics of the study population, the common allergens identified, and the association between triggers and the severity of allergic conjunctivitis symptoms.

Allergic conjunctivitis is a common ocular condition characterized by conjunctival inflammation, primarily triggered by hypersensitivity reactions to environmental allergens [8]. The findings of our study enhance the understanding of specific allergens associated with allergic conjunctivitis and their correlation with symptom severity.

The identification of pollen, dust mites, and pet dander as the predominant allergens in our study population is consistent with previous research highlighting the significance of these triggers [2, 3]. These environmental allergens are prevalent and known to provoke immune responses in susceptible individuals, resulting in the characteristic signs and symptoms of allergic conjunctivitis [4, 5].

Furthermore, our study demonstrated a relationship between certain allergens, specifically pollen and dust mites, and the severity of allergic conjunctivitis symptoms. Patients experiencing moderate to severe symptoms reported higher exposure to these allergens compared to those with mild symptoms [6]. This finding emphasizes the importance of allergen avoidance strategies and targeted interventions in managing allergic conjunctivitis.

The prevalence of mold spores, cosmetics, and medications as triggers of allergic conjunctivitis within our study population underscores the diverse range of potential allergens implicated in this condition [9]. Although less common, these allergens may still significantly contribute to allergic reactions in susceptible individuals.

It is important to recognize the limitations of our study, including its small sample size and reliance on patient-reported data, which may introduce biases. Additionally, the cross-sectional design restricts our ability to establish causality between allergen exposure and symptom severity.

Further research is necessary to validate our findings in larger, prospective studies and to investigate additional factors influencing allergic conjunctivitis, such as genetic predisposition and environmental factors [10, 11]. Eye diseases can adversely affect patients' quality of life [12], thus eye allergies should not be underestimated.

Moreover, longitudinal studies assessing the impact of allergen avoidance measures and treatment interventions on symptom control are required to effectively guide clinical practice. The economic burden of allergic conditions may also impact patients [13, 14], and this aspect warrants further exploration.

In summary, our study offers valuable insights into the causes of allergic conjunctivitis and their relationship with symptom severity. By identifying the key allergens contributing to allergic conjunctivitis and their effects on symptomatology, we aim to inform personalized management approaches and enhance patient outcomes.

Conclusion

In conclusion, our research contributes significantly to the understanding of allergic conjunctivitis, emphasizing the role of specific allergens and their correlation with symptom severity. The findings advocate for targeted allergen avoidance strategies and personalized management approaches, which are essential for improving patient outcomes. Future research should focus on larger, long-term studies to further explore the implications of allergen exposure and to develop more effective treatment modalities.

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Conflict of interest: None

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Ethics statement: Patients were asked for written consent for the data and results for research purposes.

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