

Exploring the Co-occurrence of Allergic Conjunctivitis in Patients Diagnosed with Allergic Rhinitis

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Abstract:

Background: Common clinical manifestations of Allergic conjunctivitis (AC) include itching, tearing, and redness of the eyes, collectively referred to as total ocular symptom scores (TOSS). Despite its prevalence, AC often goes undiagnosed in individuals with confirmed allergic rhinitis (AR). This study aimed to determine the incidence of AC in patients diagnosed with AR.

Materials and Methods: A randomized observational study was conducted on 145 AR-diagnosed patients. Participants were directly queried about AC symptoms using a standardized screening approach that assessed redness, itching, and tearing of the eyes, quantified by TOSS. Indirect symptoms potentially linked to AC were also evaluated.

Results: Of the 145 participants, 51.03% reported AC symptoms upon direct questioning. Additional symptoms such as squinting and excessive blinking were also identified. Treatment with olopatadine significantly reduced TOSS scores within five minutes, with majority of patients showing symptom improvement. This approach uncovered 39.31% of previously undiagnosed AC cases. TOSS-based assessments identified AC in 90.34% of cases, while inclusion of additional symptoms increased diagnostic rates to 95.17%. Allergic dermatitis emerged as a common co-morbidity among AC patients.

Conclusion: Standardized screening questions identified only 51.03% of AC cases. Incorporating targeted symptom-specific queries and therapeutic trials for suspected cases can improve the detection of AC, enabling timely treatment and symptom relief.

Keywords: Conjunctivitis, Rhinitis, Allergy.

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Introduction

Allergic conjunctivitis (AC) constitutes approximately 15% of eye-related consultations in primary care facilities, often presenting in acute forms that may be either seasonal or perennial in nature. Seasonal allergic conjunctivitis (SAC), classified as a type I hypersensitivity reaction mediated by immunoglobulin E (IgE), is most prevalent during periods of high pollen concentration, typically in spring and summer.

AC is commonly characterized by symptoms such as itching, watery eyes, or redness, collectively described as the "triple ocular symptom score" (TOSS) [1-3]. The prevalence of AC is estimated to reach up to 20% in developed nations, often

coexisting with allergic rhinitis (AR). However, most affected individuals tend to manage their symptoms independently, either by avoiding allergens or by using over-the-counter medications, with only 10–12% seeking professional medical care. Notably, AC frequently goes undiagnosed, even in patients already diagnosed with AR.⁵ The under-recognition of AR is similarly significant, and with estimates suggesting that 25–60% of AR cases remain undiagnosed [4-7].

Clinically, patients with AC exhibit increased sensitivity, and habitual rubbing of the eyelids can lead to dermatitis, often diverting their focus from conjunctival symptoms to those associated with

dermatitis. The World Allergy Organization (WAO) nomenclature review committee has updated the global terminology for allergic conditions. They recommend that immunologically mediated nasal symptoms such as itching, sneezing, nasal discharge, and congestion be termed allergic rhinitis (AR), with the majority of cases being IgE-mediated. Accordingly, the appropriate term is "IgE-mediated allergic rhinitis" [8,9]. Examining allergic conditions during childhood and adolescence is particularly relevant, as this developmental stage may influence susceptibility to allergens.

This study was conducted among pediatric and adult populations residing in rural areas. The primary aim was to determine the incidence of AC in individuals diagnosed with AR. Additionally, the research sought to evaluate the severity of AC and explore the potential association between these two conditions.

Material and Methods

A randomized observational study was conducted over five months (February–July) during the pollen season. The study involved 145 participants, including both children and adults, who were diagnosed with allergic rhinitis (AR). Diagnosis of AR was established through clinical history, physical examination, and skin prick testing performed by an allergy specialist. Exclusion criteria included prior use of antihistamines, refusal to participate, incomplete questionnaire responses, history of other allergies, or lack of consent.

Patients were screened for allergic conjunctivitis (AC) using standardized questions to identify symptoms such as redness, itching, and tearing of the eyes, quantified by the Total Ocular Symptom Score (TOSS), expressed as a percentage ranging from 0 to 100. Additional indirect symptoms—such as eyelid dermatitis, frequent blinking, and

sensitivity to light, and frontal headache—were also assessed. To detect silent cases of AC, patients were administered one drop of olopatadine hydrochloride 0.1% in each eye. Olopatadine was chosen for its established efficacy, minimal side effect profile, and rapid onset of action, typically evident within five minutes.

Data analysis was performed using Microsoft Excel 2013. Paired t-tests were applied for statistical comparisons, and Pearson correlation coefficients were used to examine relationships between TOSS positivity and additional symptoms.

Results

Among the 145 study participants, 59 were female and 86 male, with a mean age of 29.82 ± 6.45 years (Table 1). Direct questioning combined with Total Ocular Symptom Score (TOSS) assessments identified AC in 74 individuals (51.03%). Additional symptoms associated with AC included frequent blinking, squinting, eyelid dermatitis, and frontal headache (Table 2). The administration of olopatadine hydrochloride, an antihistamine, resulted in significant reductions in TOSS scores within five minutes of treatment. Symptom improvement was observed in 117 patients (80.69%), while 28 patients (19.31%) showed no change (Table 3). In individuals with no prior AC diagnosis and a baseline TOSS of 0, the therapeutic challenge with olopatadine identified 57 silent AC cases (39.31%). Conversely, no changes in TOSS were recorded among the 30 healthy controls treated with olopatadine.

As shown in Table 4, using TOSS alone, AC was diagnosed in 131 patients (90.34%). Including indirect symptoms increased the detection rate to 127 patients (87.59%). When TOSS assessments were combined with additional symptom-specific questions, AC was identified in 138 patients (95.17%).

Table 1: Baseline demographic details of study participants

Parameter	n	%
Age		
≤20 years	21	14.48
21–30 years	61	42.07
31–40 years	42	28.97
41–50 years	15	10.34
>50 years	6	4.14
Mean Age (years)	29.82 ± 6.45	
Gender		
Male	86	59.31
Female	59	40.69

Table 2: Prevalence of Allergic Conjunctivitis (AC) Symptoms

Symptom	n	%
Directly identified by AC symptoms	74	51.03
Squint	69	47.59
Blinking	75	51.72
Eyelid dermatitis	61	42.07
Frontal headache	63	43.45

Table 3: Treatment Effectiveness of Olopatadine on TOSS Scores

Outcome	n	%
Improved symptoms	117	80.69
No change in symptoms	28	19.31

Table 4: Diagnostic Outcomes Using TOSS and Additional Questions

Diagnostic Method	n	%
Silent AC sufferers identified via therapeutic challenge	57	39.31
AC subjects identified through TOSS symptoms	131	90.34
Indirect AC symptoms identified	127	87.59
Combined TOSS and additional questions	138	95.17

Discussion

The eyes and nose were the primary sites targeted by allergens, making allergic conjunctivitis (AC) a commonly reported reaction. In most cases, AC was mild and went unnoticed as patients rarely sought medical attention.

However, repeated allergen exposure often led to more severe manifestations [7]. Singh et al. reported a 30% prevalence of AC among ophthalmology outpatients in North India. Another study conducted by Gradman et al. in Denmark found that 42% of AC cases were associated with rhinitis, while 30% were linked to eczema, and 24% were associated with asthma [10].

Wade et al. observed a higher incidence of AC among females compared to males, although the difference, consistent with the present study, was not statistically significant. Similarly, Uchio et al. also reported a higher prevalence of AC in females. In the current study, allergic rhinitis (AR) was the most frequent comorbidity, present in over 76% of patients, followed by asthma in 50%. Allergic dermatitis was another comorbidity observed in patients with AC. Rasario et al. noted that most children with AC also had AR, which significantly impacted their quality of life [11-13].

Direct questioning about AC symptoms identified its presence in 50.9% of patients with AR. However, indirect symptom-based inquiries increased the detection rate of AC to 95.5%. A therapeutic challenge with olopatadine was conducted on 30 healthy, non-atopic controls to rule out any nonspecific lubricating effects of the eye drop. There was no notable improvement in controls, confirming that the observed symptom relief was attributable to olopatadine rather than lubrication. Co-occurrence of AC in AR patients

was well-established, though it was underreported, with a frequency as low as 40% [14].

Underdiagnoses of AC may result from patients and clinicians focusing more on other allergic conditions, such as AR or rhinitis [15]. Approximately 39% of AR patients considered their symptoms normal, underscoring the lack of awareness and appreciation of AC symptoms. This was particularly significant as untreated AC negatively affected patients' quality of life. The study highlighted the utility of therapeutic challenges and specific questioning in improving recognition of AC.

The reliance on direct survey questionnaires in this research may introduce limitations, as responses could be influenced by external factors or the presence of others, potentially affecting the accuracy of the data.

Conclusion

Ocular allergic reactions are frequently underestimated as minor inconveniences, leading many patients to forgo seeking medical attention until symptoms become severe. Standard screening questions were able to identify only 51.03% of cases of AC. However, additional symptoms such as frequent blinking, squinting, eyelid dermatitis, and frontal headaches, combined with the diagnostic use of olopatadine hydrochloride eye drops, can aid in identifying patients with previously unrecognized or "silent" AC symptoms.

References

1. Neffen H, Mello JF, Sole D, Naspitz CK, Doderio AE, Garza HL, et al. Nasal allergies in the Latin American population: results from the allergies in Latin America survey. *Allergy Asthma Proc.* 2010; 31(Suppl 1):9-27.

2. Ono SJ, Abelson MB. Allergic conjunctivitis: update on pathophysiology and prospects for future treatment. *J Allergy Clin Immunol.* 2005; 115(1):118–22.
3. Manners T. Managing eye conditions in general practice. *BMJ.* 1997; 315(7111):816–7.
4. Bielory L. Allergic conjunctivitis and the impact of allergic rhinitis. *Curr Allergy Asthma Rep.* 2010; 10(2):122–34.
5. Pitt AD, Smith AF, Lindsell L, Voon LW, Rose PW, Bron AJ. Economic and quality-of-life impact of seasonal allergic conjunctivitis in Oxfordshire. *Ophthalmic Epidemiol.* 2004; 11(1):17–33.
6. Wüthrich B, Brignoli R, Canevascini M, Gerber M. Epidemiological survey in hay fever patients: symptom prevalence and severity and influence on patient management. *Schweiz Med Wochenschr.* 1998; 128(5):139–43.
7. Nathan RA, Meltzer EO, Selner JC, Storms W. Prevalence of allergic rhinitis in the United States. *J Allergy Clin Immunol.* 1997; 99(6):808–14.
8. Johansson SG, Bieber T, Dahl R, Friedmann PS, Lanier BQ, Lockey RF, et al. Revised nomenclature for allergy for global use: report of the nomenclature review committee of the World Allergy Organization, October 2003. *J Allergy Clin Immunol.* 2004; 113(5):832–6.
9. Gupta S, Gupta V. Study of incidence of allergic conjunctivitis in patients with allergic rhinitis. *Int J Res Med Sci.* 2021; 9(10):1-3.
10. Gradman J, Wolthers OD. Allergic conjunctivitis in children with asthma, rhinitis and eczema in a secondary outpatient clinic. *Pediatr Allergy Immunol.* 2006; 17(7):524-6.
11. Wade PD, Iwuora AN, Lopez L, Muhammad MA. Allergic conjunctivitis at Sheikh Zayed Regional Eye Care Center, Gambia. *J Ophthalmic Vis Res.* 2012; 7(1):24-8.
12. Rosario N, Bielory L. Epidemiology of allergic conjunctivitis. *Curr Opin Allergy Clin Immunol.* 2011; 11(5):471-6.
13. Marback PMF, de Freitas D, Junior AP, Junior AP, Junior RB. Epidemiology and clinical features of allergic conjunctivitis in a reference center. *Arq Bras Oftalmol.* 2007; 70(2):312-6.
14. Bousquet J, Cauwenberge PV, Khaltaev N. Allergic rhinitis and its impact on asthma. *J Allergy Clin Immunol.* 2001; 108(5):147-334.
15. Neilson R, Bielory L. Epidemiology of allergic conjunctivitis. *Curr Opin Allergy Clin Immunol.* 2011; 11(5):471-6.