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Original Article

Dry eye in patients with allergic conjunctivitis

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Abstract

Aim: Ocular allergy is an ocular surface disease deteriorates the patient's quality of life. This situation continues and repeats inflammation via allergen contacts. Inflammation disrupted the tear film instability and may lead to dry eye. The aim of our study is to investigate concurrently appearing signs and symptoms of dry eye in a group of patients with symptomatic allergic conjunctivitis.
Material and Methods: To be evaluated 141 patients with ocular allergy and 138 patient without ocular allergy in terms of dry eye symptoms and signs by Oxford scheme, OSDI scores, Break up time (BUT) and Schirmer test.
Results: There was a statistically significant difference was detected between the dry eye scores of the two groups.
Conclusion: It may be related that ocular allergy and dry eye. Because of this relation, patients have ocular allergy evaluated in terms of dry eye simultaneously.

Keywords: dry eye; allergic conjunctivitis; break up time; schirmer; osdi.

INTRODUCTION

Dry eye syndrome is a disease of the ocular surface and it is multifactorial. Inflammatory diseases of the ocular surface cover a wide spectrum in which ocular allergy, asthma, rhinitis and DED are also included Activation of the inflammatory cascade is the reason lying beneath the diseases. Vernal and atopic conjunctivitis are considered among the causes for DED and dry eye like symptoms (1,2). Most of the times signs and symptoms of allergic conjunctivitis and dry eye diseases are intervened (3-5).

Ocular allergy does not cause major tissue damage, but it detoriates patient's quality of life grossly and its prevalence in general population might go up to 30%. [6] Certain factors such as industrialization, air pollution, and global climate change and changes in personal hygiene contribute to individuals contact with the allergens and shapes their reaction to such (7). Contact with allergens trigger an immune response which disrupts the corneal and conjunctival cell stability, especially the stability of goblet cells (8). Environmental factors and cell loss due to inflammation impair tear components, which may lead to dry eye disease (9). This can explain why dry eye disease and ocular allergy are frequently reported together in the literature (10).

Ocular allergy and dry eye disease can co-exist but usually their signs and symptoms mimic each other. This may lead to delay in proper treatment and even failure of treatment in patients who are not diagnosed accurately. Therefore, the aim of our study is to investigate concurrently appearing signs and symptoms of dry eye in a group of patients with symptomatic allergic conjunctivitis (AC).

MATERIAL and METHODS

Staging

This was a retrospective study conducted between April 2017 and June 2017. We collected data from the medical record files of the patients who were examined for itching, photophobia, irritation, and ocular pain and who were diagnosed as having seasonal and perennial AC at the Maltepe University Medical Faculty Hospital .Our institutional review board (the Ethics Committee of Maltepe University) approved the study protocol that adhered to the tenets of the Declaration of Helsinki.

One hundred forty-one patients with allergic symptoms constituted the case group and 138 patients without any allergic symptoms were included in the study as the control group. Inclusion criteria were no previous history of ocular surgery, no previous history of topical or systemic treatment for dry eye disease (DED) and AC, and having no

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acute or chronic diseases other than ocular allergy.

Technique

We extracted the data for ocular surface disease index (OSDI) scores, breakup time (BUT) values, Oxford scheme scores, before treatment for all enrolled patients

The OSDI test is a 12-question questionnaire that evaluates the symptoms of ocular irritation and its visual-related functions to assess DED severity with scores ranging from 0 to 100 (11).

The Schirmer test I measures the tear amounts on the eye surface by placing filter papers (SNO* Strips, Lab Chauvin, Aubenas, France) in the inferior fornix without topical anesthesia. The amount of wetting on the filter paper after 5 min is recorded as the test result. For our study, we defined the results < 10 mm in the Schirmer test as positive for DED (11).

In the tear BUT test, the inferior fornix is touched using saline-soaked fluorescein sticks (Fluorescein, Haagen–Streit International, Koeniz, Switzerland). The patients are asked to blink and then abstain from blinking until told to do so. The time from the first blink to the detection of dry area formation on the cornea is recorded as the BUT value. We used the BUT values < 8 s to detect DED (12).

The Oxford scheme is a test to assess the state of the ocular surface using a fluorescein stick to stain the cornea, and the results are graded from 0 (no staining) to 5 (severe staining) (13).

RESULTS

Gender and age distribution of the patients included in the study were shown in Table 1. There was no statistically significant difference between two groups for age and gender.

Dry eye scores of participants were shown in Table 2. Statistically significant difference was detected between the dry eye scores of two groups. 30.49% of patients with ocular allergies had mild corneal staining, and 1.72% had severe corneal staining. All patients without ocular allergies had slight corneal staining and none of them had severe corneal staining. It was statistically significant ($p<0.05$).

While 10 patients in the allergy group had systemic allergy (5 allergic asthma, 3 atopic dermatitis, 2 allergic rhinitis), whereas the patients with no ocular allergy only 3 patients had allergic rhinitis. But no statistically significant.

Table 1. Gender and age distribution between case and control groups

		Case Group			Control Group			p
		Mean±s.d.	n-%	Median	Mean±s.d.	n-%	Median	
Age		18.9±12.6		15.0	16.6±10.1		13.0	0.323[m]
Sex	Female	63	44.7%		66	46.8%		0.761X²
	Male	78	55.3%		72	51.1%		

[m] Mann-Whitney u test / x² Chi-square test, Case grup : Patients with allergy, Control group: Patient without allergy

Table 2. Dry eye scores of participants

	Case Group		Control Group		
	Mean±s.d	Median	Mean±s.d	Median	p
OSDI	20.8±6.7	20.5	23.7±7.1	20.5	0.008[m]
BUT	17.2±2.9	16.0	16.3±2.9	16.0	0.020[m]
SCHIRMER	13.6±1.6	14.0	12.7±1.6	13.0	0.008[m]

[m] Mann-Whitney u test, Case grup : Patients with allergy, Control group: Patient without allergy,
OSDI : Ocular surface disease index, BUT : Break up time

DISCUSSION

The association of dry eye and ocular allergy is frequently discussed in the literature. However, was not found any studies conducted in a residential area where many allergens have been and many ethnicities have been lived together with such as the habitat the previous study was done.

Previously in the literature, it has been reported that dry eye symptoms tend to alleviate during the autumn season and this has been linked to allergic activation (14). Itching is one of the most prominent symptoms of AC and studies have found that AC and DED are the primary reason underlying the itching (15). The study was conducted in the spring. The patients were diagnosed with allergic conjunctivitis. Redness and itching were evaluated as the main symptom in allergic conjunctivitis. Likewise, these findings can be the main symptom in dry eye and dry eye-

like diseases. In this article, the sample group is similar to other articles investigating this issue in the literature. In the study, it was looked at the presence of dry eye symptoms in patients with allergic conjunctivitis and the other results supported the present study

Another study in the literature, it was found that tear breakup time was shorter in patients who had allergic conjunctivitis during childhood (16). In the present study was found that patients have allergic conjunctivitis had worse BUT scores the other group like the previous study.

The other study conducted with 35 children with vernal conjunctivitis, it was reported that dry eye symptoms are more severe in vernal conjunctivitis, and even during the times of inactive signs and symptoms for ocular allergy, dry eye continued (17). Our study supported these findings. OSDI test which questioned for the symptoms of dry eye (Eyes that are sensitive to light? Have problems with your eyes limited you in reading? Have your eyes felt uncomfortable in areas that are air-conditioned? etc.) worsened in the allergic group. However, because of the retrospective design of our study, the dry eye related findings of the patients, whether it continues was unknown during the non-allergic season.

In another study, it has been shown that response to allergens is more severe individuals who are predisposed to ocular pathologies such as DED and AC.[18] Additionally it has been shown that tear stability is decreased in not only in individuals with AC but also in individuals with atopic dermatitis and allergic asthma (19).

In our study, although not statistically significant, systemic symptoms such as asthma and atopic dermatitis was more common in the allergy group.

In the other study, IgE levels were investigated, it has found dry eye symptoms to manifest more severely in patients who have ocular allergy signs and symptoms and it has been speculated that DED is a sub type of dry eyes syndrome without antigen and antibody positivity (20). This was a limiting factor for the present study. In the study, IgE levels could not be studied in the patients but the patients with allergy had worse BUT, oxford score and Schirmer test than non-allergic patient and had lower OSDI questionnaire scores. So these patients had severe DED signs then without allergic patients. The findings support the previous studies.

CONCLUSION

In conclusion, ocular allergy seems to be more associated with dry eye symptoms and signs. However, more clinical and laboratory studies are needed.

Competing interests: The authors declare that they have no competing interest.
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