Section: Ophthalmology

Original Research Article

A HOSPITAL BASED COMPARATIVE STUDY OF OCULAR SURFACE CLINICAL FINDINGS IN AUTOIMMUNE-ASSOCIATED DRY EYE DISEASE VERSUS NON-AUTOIMMUNE DRY EYE DISEASE

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ABSTRACT

Background: Dry eye disease (DED) is a multifactorial condition with significant morbidity. Systemic autoimmune diseases such as Sjögren's syndrome, rheumatoid arthritis, and lupus frequently involve the ocular surface. Dry eye can be a sign of an underlying systemic disease, which is a medical condition affecting the whole body, not just the eye. **Objective:** To compare ocular surface clinical findings in autoimmune-associated dry eye disease versus non-autoimmune dry eye disease

Material and Methods: A Prospective study was conducted at Sri Madhusudhan Sai Institute of Medical Sciences, India. 26 patients diagnosed with systemic autoimmune disorders presenting with ocular surface complaints and 20 with no systemic autoimmune diseases were evaluated for visual acuity, slit lamp examination, dry eye assessment with IDRA.

Results: The mean age of presentation was 43.15 years, with a female predominance (60%). Ocular surface findings included dry eye disease, keratinization, tarsal fibrosis, symblepharon, scleritis, and persistent epithelial defects.

Conclusion: Systemic autoimmune disorders predispose to more severe ocular surface damage and distinct, highlighting the importance of early screening and tailored management.

Keywords: dry eye disease, profile, autoimmunity.

INTRODUCTION

Dry eye syndrome is one of the most common problems affecting the general population and can cause problems that range in severity from mildly irritating to debilitating. Dry eye syndrome is a general term that describes the state of the front of the eye in response to a breakdown in the natural layer of tears that coats the front of the eye, called the tear film. Normally, this layer of tears is a stable, homogenous layer that not only provides the cornea and conjunctiva a healthy buffer from damage were it constantly exposed to the air, but this interface between the tear film and the air is also responsible for a significant amount of the focusing power of the eye. When the tear film becomes unhealthy, it breaks down in different places on the cornea and conjunctiva, leading not only to symptoms of irritation, but also to unstable and intermittently changing vision.[1,2]

Dry eye disease (DED) is a multifactorial condition with significant morbidity. Systemic autoimmune diseases such as Sjögren's syndrome, rheumatoid arthritis, and lupus frequently involve the ocular surface. Dry eye can be a sign of an underlying systemic disease, which is a medical condition affecting the whole body, not just the eye. ocular surface clinical findings in autoimmune-associated dry eye disease.[3,4]

The present study aims to correlate ocular surface clinical findings with tear biomarkers in autoimmune-associated DED versus non-autoimmune DED.

MATERIALS AND METHODS

A Prospective comparative study was carried out at Department of Ophthalmology at a tertiary care hospital over a period of two years. A total of 46 patients with dry eye disease were included in the present study. Among them, 26 were having the systemic autoimmune disorder and 20 were without the systemic autoimmune disorder. Institution Ethics Committee permission was obtained. Written informed consent was taken from all eligible study subjects.

Patients were divided in two groups: Group A had 52 eyes of 26 patients who were having systemic autoimmune disorders presenting with ocular surface disease. Group B had 40 eyes of 20 patients who had ocular surface disease without systemic autoimmune disease.

Assessments were done by clinical examination. Slit lamp findings like keratinization, fibrosis, symblepharon, etc. were noted. Quantitative analysis included Schirmer test, fluorescein and rose Bengal staining.

Non-invasive dry eye assessment was done (IDRA, tear film breakup time, meibography, lipid inferometry) were analyzed.

The data was entered in the Microsoft excel worksheet and analyzed using proportions.

RESULTS

Ten percent of patients met the Japanese criteria for SS. No difference in dry eye tests or LI was observed between SS patients and non-SS patients. Even in the non-SS group, 90% of patients were diagnosed with probable dry eye. In SS patients, positive correlations were observed between LI and Schirmer test (P = .048), ESR and Schirmer test (P = .035), ESR and rose bengal staining (P = .001), and grip strength and rose bengal staining (P = .047). No such correlations were observed in the non-SS patients.

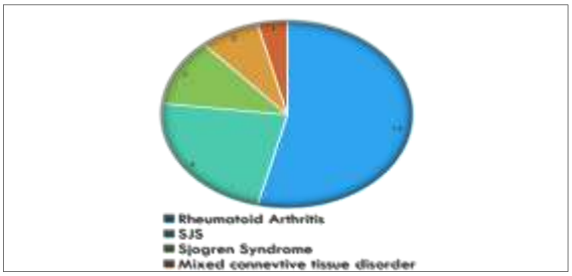

Figure 1: Clinical findings in patients with systemic autoimmune disorders (N=26)

14 cases had rheumatoid arthritis. Three had SJS and 6 had Sjogren syndrome. Two had mixed connective tissue disorder. [Figure 1]

Table 1: Distribution as per demographics

Demographics	Number	%
Mean age = 43.15 years	--	--
Males	14	30.4
Females	27	58.7
Children	05	10.9

The mean age was 43.15 years. Males were 30.4% and females were 58.7%. Children were 10.9%. [Table 1]

Table 2: Ocular surface findings

Age Group	Mean Prostate Volume (cc)
40–49	36.4 ± 15.8
50–59	34.8 ± 12.3
60–69	42.8 ± 19.7
≥70	57.6 ± 27.3

All cases had dry eye disease. 20% had keratinization. 10% had symblepharon. 8% had scleritis. 5% had persistent epithelial defects. [Table 2]

Table 3: Comparison of characteristics in two groups

Characteristics	Group A	Group B
Mean NITBUT	5.67 sec	7.43 sec
Lipid layer	63.8 nm	68.5 nm
Tear meniscus height	0.12 mm	2 mm
Meibomian gland loss in upper lid	57%	23%
Meibomian gland loss in lower lid	51%	37%

The mean NITBUT, lipid layer, tear meniscus height was lesser in group A patients compared to group B patients. Meibomian gland loss in upper lid and in the lower lid was more in group A patients compared to group B patients. [Table 3]

DISCUSSION

Dry eye disease (DED) is a multifactorial disorder of the ocular surface characterized by tear film instability, ocular surface inflammation, and neurosensory abnormalities. It is commonly

associated with systemic conditions, particularly autoimmune disorders, where immune-mediated inflammation contributes significantly to ocular surface damage. The present study evaluated and compared the ocular findings in patients with dry eye disease associated with autoimmune diseases and those with non-autoimmune etiologies.

Our findings demonstrate that patients with autoimmune diseases exhibited more severe ocular surface changes compared to those with non-autoimmune dry eye. This observation can be attributed to the chronic immune-mediated destruction of the lacrimal glands and conjunctival epithelium seen in autoimmune disorders. Reduced tear secretion and persistent inflammatory activity lead to significant tear film instability and epithelial damage. These mechanisms have been widely described in autoimmune conditions such as Sjögren's syndrome, rheumatoid arthritis, and systemic lupus erythematosus.

In the present study, clinical signs such as reduced tear breakup time (TBUT), decreased Schirmer's test values, and increased ocular surface staining were more prominent in the autoimmune group. These findings indicate both aqueous tear deficiency and ocular surface inflammation. In contrast, patients in the non-autoimmune group more commonly demonstrated mild to moderate tear film instability, likely related to environmental factors, aging, meibomian gland dysfunction, or prolonged digital device use.

Another important observation was the increased prevalence of conjunctival hyperemia, punctate epithelial erosions, and filamentary keratitis among patients with autoimmune disease. These findings reflect the chronic inflammatory nature of autoimmune-associated dry eye disease. Persistent inflammation results in disruption of the ocular surface homeostasis, epithelial barrier dysfunction, and reduced goblet cell density, further aggravating tear film instability.

The severity of symptoms also appeared to correlate with the objective clinical findings in autoimmune dry eye patients. Many patients reported significant ocular discomfort, foreign body sensation, burning, and photophobia. This may be related to chronic ocular surface inflammation and neurosensory alterations associated with autoimmune disease. In contrast, some patients in the non-autoimmune group showed milder clinical signs despite reporting symptoms, highlighting the complex relationship between symptoms and signs in dry eye disease.

These findings emphasize the importance of early identification of systemic autoimmune diseases in patients presenting with severe or refractory dry eye. Ophthalmologists play a crucial role in recognizing ocular manifestations that may prompt further systemic evaluation and interdisciplinary management. Early diagnosis and targeted therapy can help prevent progressive ocular surface damage and improve patient quality of life.

CONCLUSION

Dry eye is common in RA patients, including those without SS. We found that there was a correlation between LI and Schirmer test in RA patients with SS, but no correlation when the entire group was analyzed. Dry eye always should be taken into consideration regardless of the RA activity, because the severity of dry eye is independent of RA activity. Patients with systemic autoimmune disorders exhibit more severe ocular surface changes. The identification of clinical signs and their evaluation into routine practice may enable earlier intervention and better disease monitoring.

REFERENCES

1. De Gomes B AF, Santhiago MR, de Azevedo MN, Moraes Jr HV. Evaluation of dry eye signs and symptoms in patients with systemic sclerosis. Graefes Arch Clin Exp Ophthalmol. 2012;250:1051–6.
2. Usuba FS, Lopes JB, Fuller R, Yamamoto JH, Alves MR, Pasoto SG, et al. Sjögren's syndrome: an underdiagnosed condition in mixed connective tissue disease. Clinics (Sao Paulo). 2014;69:158–62.
3. Patel SJ, Lundy DC. Ocular manifestations of autoimmune disease. Am Fam Physician. 2002;66:991–8.
4. Guannan H, Long S, Xia H, Dong W, Shaozhen Z. Clinical characterisation and cytological study of dry eye in patients with autoimmune disease. J Pak Med Assoc. 2018;68:353–8.
5. Toda I, Fujishima H, Tsubota K. Ocular fatigue is the major symptom of dry eye. Acta Ophthalmol (Copenh). 1993;71:347–52.
6. Shimazaki-Den S, Iseda H, Dogru M, Shimazaki J. Effects of diquafosol sodium eye drops on tear film stability in short BUT type of dry eye. Cornea. 2013;32:1120–5.
7. Yokoi N, Georgiev GA. Tear-film-oriented diagnosis for dry eye. Jpn J Ophthalmol. 2019;63:127–36.
8. Yoshimura A, Hosotani Y, Masuda N, Gomi F. Characteristics of dry eye associated with autoimmune diseases. Jpn J Ophthalmol. 2025 Mar;69(2):188-195.