Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Clinical and Experimental Ophthalmology

Journal homepage: www.ijceo.org

Original Research Article

The prevalence of dry eye in patients with psoriasis attending a tertiary care hospital in western Maharashtra

Kanchan Bala Rathore[1], **Kiran Jagannath Dange**[2]*, **Praneet Awake**[3]

[1]*Dept. of Ophthalmology, Symbiosis Medical College for Women, Symbiosis International (Deemed) University, Pune, Maharashtra, India*
[2]*Dept. of Dermatology, B. J. Govt Medical College and Sassoon General Hospital, Maharashtra University of Health Sciences, Pune, Maharashtra, India*
[3]*Dept. of Dermatology, Symbiosis Medical College for Women, Symbiosis International (Deemed) University, Pune, Maharashtra, India*

ARTICLE INFO

Article history:
Received 26-09-2023
Accepted 04-11-2023
Available online 30-03-2024

Keywords:
Dry eye
OSDI
PASI

ABSTRACT

Background: Psoriasis affects 0.5–11.4% of adults. Psoriasis is caused by a complicated chain of immune cells and cytokines, containing tumour necrosis factors (TNF), interleukin (IL)-17, 22, and 23. Psoriasis causes systemic inflammation, which can cause arthritis, cardiovascular disease, and metabolic syndrome. Our study explores dry eye in Western Maharashtra's psoriasis patients at a tertiary care hospital.
Materials and Methods: A tertiary care hospital outpatient dermatology and ophthalmology department psoriasis patients were included in a cross-sectional research. Patient ages spanned from 20 to 60 years. The anterior and posterior ocular segments were examined, and dry eye was assessed. OSDI, Schirmer's test, TBUT, and corneal and conjunctiva staining has been scored. The PASI score has been received. Degree of dry eye was assessed using Dews dry eye grading system.
Results: Dry eye was present in 63.1 percent of people. Cases included 24.4% with mild dryness in their eyes. Moderate dryness made up 46.3% of cases, and severe dryness made up 29.3% of cases. The PASI score and dry eye did not have a statistically significant connection (P=0.355). A PASI score of 10 to 25 indicated the most severe case of dry eye, followed by a score of 10 (29 eyes) and >25. (23 eyes). A total of 81.5 percent of eyes had abnormal OSDI scores, 56.2 percent had abnormal TBUT scores, and 49.2 percent had abnormal Schirmer Test results.
Conclusion: Dry eye in psoriasis patients requires dermatologist-ophthalmologist teamwork for comprehensive therapy. Psoriasis, especially in long-lasting cases, can lead to meibomian gland dysfunction.

1. Introduction

Psoriasis, a prevalent inflammatory skin condition, impacts approximately 0.5-11.4% of adults. It can arise from various causative factors.[1,2] "Psoriasis results from a complex cascade involving multiple cytokines and immune cells, such as TNF, IL-17, IL-22, and IL-23.[3] Comorbidities like arthritis, cardiovascular disease, and metabolic syndrome are all significantly correlated with the systemic inflammation that characterises psoriasis. This established connection is backed by extensive study.[4,5]

While psoriasis commonly has ocular manifestations, clinicians often overlook this aspect of the disease. Ocular issues, including blepharitis, conjunctivitis, dry eye, keratitis, uveitis, and cataracts, are commonly documented and documented.[6,7] In patients with psoriasis, dry eye

* *Corresponding author*.
E-mail address: kirandange@hotmail.com (K. J. Dange).

https://doi.org/10.18231/j.ijceo.2024.013

disease may result from a combination of chronic systemic inflammation affecting tear production and ocular surface, as well as potential autoimmune reactions targeting the lacrimal glands and exacerbation of eye-related psoriasis manifestations. Dry eyes disease, also known as a tear production malfunction or instability of the tear film, had been stated to affect anywhere from five to eighteen and a half percent of people with psoriasis.[8] There have been several case-control studies carried out to study this link, however the results have been inconclusive.[9,10] This study's objective was to determine the dry eyes prevalence among psoriasis patients who were visiting a tertiary care facility in Western Maharashtra.

2. Materials and Methods

Patients with psoriasis who visited the outpatient Department of Dermatology and Ophthalmology at tertiary care hospital were included in a cross-sectional study. In accordance with ethical guidelines and to ensure the protection of participants' rights, this study received formal approval from the institutional review board (IRB).

The patients' ages ranged from 20 to 60 years. The informed consent was obtained from all participating patients, ensuring ethical standards were followed in the study. The anterior and posterior segments of an eyes were evaluated, and a comprehensive evaluation of dry eye was carried out. Scores were taken for the Schirmer's test, Ocular Surface Disease Index (OSDI), tear film breakup time (TBUT), and corneal and conjunctiva staining. The Psoriasis Area and Severity Index (PASI) score was considered.

Dry eye was determined to be present, and its level of severity was determined using the Dews dry eye grading system. Patients who had lid infections were treated, and patients who had spent more than four hours in front of a screen were counselled on proper ocular hygiene and included in the study after two weeks. All patients between 20-60 years of age diagnosed with psoriasis visiting our OPD were included in this study. The unwilling patients, those having previous history of ocular surgery or ocular trauma and any pre-existing ocular and or systemic condition causing dry eye were excluded from the study.

2.1. Statistical analysis

The data has been recorded compiled utilizing Microsoft® Excel worksheet (version 2019) and subjected to statistical analysis using SPSS (21.0, IBM, Armonk, NY, USA). Categorical data were stated as frequency, percentages, and compared utilizing Chi square test. Quantitative data has been stated as mean, standard deviation. $P<0.05$ was statistically significant.

3. Results

Baseline characteristics shows that, many of the patients 41-50 years (32.31%) age group followed by ≤30 years (24.62%), 31-40 years (16.92%), and >50 years (26.15%). The mean age was 41.55±11.90 years. 43.23% of patients were male and 50.77% of patients were female. Most of a patients had plaque type psoriasis (61.54%). Most of the patients had <1 years disease duration (49.23%).(Table 1)

Table 1: Baseline characteristics

	Frequency (n=65)	**Percentage (%)**
Age (Years)		
≤30	16	24.62%
31-40	11	16.92%
41-50	21	32.31%
>50	17	26.15%
Age Mean	41.55±11.90	
Gender		
Male	32	49.23%
Female	33	50.77%
Type of Psoriasis		
Plaque Type	40	61.54%
Pustular type	11	16.92%
Erytroderma Type	8	12.31%
Scalp Type	4	6.15%
Guttate Type	2	3.08%
Disease Duration (Years)		
<1	32	49.23%
1-5	22	33.85%
>5	11	16.92%

Table 2 shows the dry eye prevalence in the study was notably high at 63.1%, indicating that a significant majority of psoriasis patients in this cohort experienced some degree of dry eye symptoms. The severity of dry eye was categorized into three distinct levels. Among the patients with dry eye, 24.4% of eyes exhibited mild dryness. This suggests that a notable proportion of patients experienced relatively mild symptoms of dry eye, which might include occasional discomfort and irritation. The majority of eyes with dry eye, accounting for 46.3% of cases, fell into the moderate category. This indicates a substantial level of dryness and discomfort experienced by a significant portion of the study population. Approximately 29.3% of eyes with dry eye had severe dryness. This implies that a considerable portion of patients faced the most severe form of dry eye symptoms, characterized by significant discomfort, potential damage to the ocular surface, and a high impact on daily life and visual function.

This table assesses the link between PASI scores (Psoriasis Area and Severity Index) and dry eye severity. PASI scores were categorized as <10, 10-25, and >25, while dry eye severity was categorized as No dry eye, Mild,

Table 2: Dry eye

	Left	Right	Total
Dry Eye			
Present	39(60%)	43 (66.15%)	82 (63.1%)
Absent	26 (40%)	22 (33.85%)	48 (36.9%)
Severity of Dry eye			
Mild	8 (26.51%)	12 (27.91%)	20 (24.4%)
Moderate	18 (46.15%)	20 (43.51%)	38 (46.3%)
Severe	13 (33.33%)	11 (25.58%)	24 (29.3%)

Moderate, and Severe. The p-value of 0.355 indicates no significant correlation between PASI scores and dry eye severity. Patients with PASI scores of 10-25 had the highest prevalence of severe dry eye, but this relationship lacked statistical significance.

Table 3 shows that there had no statistically significant relationship in the PASI score and dry eye (P=0.355). The most severe case of dry eye had a PASI score of 10 to 25, followed by <10 (29 eyes) and >25 (23 eyes).

Table 4 shows this table highlights the prevalence of abnormal dry eye parameters in psoriasis patients. Abnormal OSDI scores were seen in 81.5% of eyes, indicating a high presence of ocular surface disease symptoms. Additionally, 56.2% of eyes had abnormal TBUT scores, signifying tear film instability, and 49.2% had abnormal Schirmer Test results, suggesting potential issues with tear production. These findings stress the need to address and manage dry eye symptoms in this patient group.

4. Discussion

Up to 18.75% of psoriasis patients have dry eye illness, which is characterised by reduced tear production, unstable tear films, and resultant local inflammation.[11] The TBUT, Schirmer I test, ocular staining test, and OSDI, which measure, respectively, tear film stability, tear production, superficial punctate keratitis, and dry eye symptoms, have all been used to determine the severity of the condition.[12,13] The study uncovered that up to 18.75% of psoriasis patients exhibit dry eye disease, which manifests as decreased tear production, unstable tear films, and concurrent local inflammation.[11] The severity of this condition was evaluated through various clinical measures, including the Tear Break-Up Time (TBUT), Schirmer I test for tear production assessment, ocular staining test to detect superficial punctate keratitis, and the Ocular Surface Disease Index (OSDI) to assess dry eye symptoms.[12]

The study's findings underscore the importance of acknowledging and managing dry eye in individuals with psoriasis. However, it is noteworthy that despite a thorough assessment of dry eye severity, the study did not identify a statistically significant correlation between the severity of psoriasis, as measured by PASI scores, and the severity of dry eye symptoms. This observation implies that additional factors, beyond the extent of psoriasis-related skin issues, may play a role in the development and intensity of dry eye among these patients. This multifactorial aspect of dry eye in the context of psoriasis highlights the need for further research to fully understand its underlying mechanisms and contributing factors.

The study's demographic data reveals several key characteristics of the patient population. The mean age was 41.55±11.90 years. 43.23% of patients were male and 50.77% of patients were female. Most of a patients' plaque type (61.54%). Most of the patients had <1 years disease duration (49.23%). In a study by Kharolia et al. a patient's mean age was 43.69 ± 1.55 years (range, 16–60 years). There were 14 females (20.6%) and 54 males (79.4%).[14] In a research by Sativada et al, Out of 80 psoriasis patients, 51 (63.75%) were men and 29 (36.25%) were women. The range of presentation ages was 18–76, with the mean age being 49.22±8.53 years. The majority of the patients, 49 (61.25%), were between the ages of 25 and 50, while 25 (31.25%) were between the ages of 50 and 75.[15] The psoriasis duration ranged from 1 month to 35 years in a research by Abbagani et al., with a mean length of 10.56 ± 7.4 years.[16]

The study's findings revealed a dry eye prevalence of 63.1%, with varying degrees of severity: 24.4% classified as mild, 46.3% as moderate, and 29.3% as severe. This highlights the significant burden of dry eye among the psoriasis patient population. In comparison, a study conducted by Titiyal et al. found clinically severe Dry Eye Disease (DED) in 32% of participants. Among these, 9.9% (496/5000) had mild DED, 61.2% (3060/5000)had moderate DED, and 28.9% (1444/5000) had severe DED.[17] These results underscore the substantial presence of DED in a broader context, not limited to psoriasis patients. Furthermore, research by Shah et al. identified that patients with blocked meibomian glands had an exceptionally high dry eye prevalence of 95%. This suggests that meibomian gland dysfunction may be a significant contributing factor to dry eye, and addressing this issue may be crucial in managing dry eye in certain patient groups.[18,19] Additionally, the study found a dry eye prevalence of 60% among smokers, indicating a potential association between smoking and dry eye. This highlights the importance of considering lifestyle factors in understanding dry eye etiology. The study's multifaceted findings shed light on the prevalence and severity of dry eye in psoriasis patients and offer insights into potential mechanisms, clinical implications, and areas for future research. Addressing dry eye in this population is essential, and further investigations could explore the interplay of various factors contributing to dry eye in both psoriasis and broader patient groups.

There has been no statistically significant relationship between the PASI score and dry eye (P=0.355). The most severe case of dry eye had a PASI score of 10 to 25, followed

Table 3: Comparison of PASI score with severity of dry eye

Dry Eye	PASI Score			P Value
	<10 (=47)	10-25 (n=50)	>25 (n=33)	
No	18 (38.30%)	20 (40%)	10 (30.30%)	0.355
Mild	5 (10.64%)	7 (14%)	8 (24.24%)	
Moderate	12 (25.53%)	14 (28%)	12 (36.36%)	
Severe	12 (25.53%)	9 (18%)	3 (9.09%)	

Table 4: Dry eye parameters

	Left Eye	Right Eye	Total
OSDI Score			
Normal	13 (20%)	11 (16.92%)	24 (18.5%)
Abnormal	52 (80%)	54 (83.08%)	106 (81.5%)
TBUT			
Normal	35 (53.85%)	22 (33.85%)	57 (43.8%)
Abnormal	30 (46.15%)	43 (66.15%)	73 (56.2%)
Schirmer Test			
Normal	36 (55.38%)	30 (46.15%)	66 (50.8%)
Abnormal	29 (44.62%)	35 (53.85%)	64 (49.2%)

by <10 (29 eyes) and >25 (23 eyes). Ocular characteristics were more common as the PASI score rose in a study by Abbagani et al., and this link has statistically significant by chi-square test (p <0.001). A majority of patients with a PASI of more than 10 exhibited ocular symptoms. There was at least one visual manifestation in every patient (N = 67) with a PASI score of higher than 15.[16]

In our study, we observed that 81.5% of eyes exhibited abnormal OSDI scores, 56.2% had abnormal TFBUT scores, and 49.2% showed abnormal results in the Schirmer Test. These findings highlight the substantial prevalence of dry eye symptoms among the psoriasis patient population.

Interestingly, a study by Aryanian et al. utilizing the Schirmer and TUBT tests found no significant difference in dry eye symptoms between patient and control groups. This suggests that the evaluation of dry eye can yield variable results and may not always distinguish between patient and control groups effectively.[20] In another study conducted by Taheri et al., participants were classified as having dry eyes based on a revised definition if their TBUT was less than 10, and their OSDI was equal to or greater than 13. This criterion reflects the evolving understanding of dry eye diagnosis, emphasizing the importance of comprehensive assessment tools like TBUT and OSDI.[21] Overall, our study's results, in conjunction with previous research, highlight the complexity of diagnosing and understanding dry eye in various patient populations. It underscores the importance of considering multiple factors and diagnostic criteria to obtain a comprehensive picture of dry eye prevalence and severity.

5. Conclusion

Dry eye is a prevalent ocular manifestation in individuals with psoriasis. To provide complete care for psoriasis patients, dermatologists must stay alert to this potential comorbidity and work closely with ophthalmologists. Meibomian gland dysfunction can result from psoriasis, especially in people with chronic illness.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Fang TP, Lin YC, Chi CC. Association of psoriasis with asthma: A systematic review and meta-analysis of observational studies. *Dermatol Sinica*. 2020;38(1):22.
2. Dai YX, Chen TJ, Chang YT. Skin care services and disease prevalence in Taiwan: A nationwide study. *Dermatol Sinica*. 2018;36(3):124–30.
3. Boehncke WH, Schön MP. Psoriasis. *Lancet*. 2015;386(9997):983–94.
4. Takeshita J, Grewal S, Langan SM, Mehta NN, Ogdie A, Voorhees ASV, et al. Psoriasis and comorbid diseases: Epidemiology. *J Am Acad Dermatol*. 2017;76(3):377–90.
5. Menter A, Strober BE, Kaplan DH, Kivelevitch D, Prater EF, Stoff B, et al. Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with biologics. *J Am Acad Dermatol*. 2019;80(4):1029–72.
6. Rehal B, Modjtahedi BS, Morse LS, Schwab IR, Maibach HI. Ocular psoriasis. *J Am Acad Dermatol*. 2011;65(6):1202–12.
7. Chaiyabutr C, Ungprasert P, Silpa-Archa N, Wongpraparut C, Chularojanamontri L. Psoriasis and Risk of Uveitis: A Systematic Review and Meta-Analysis. *Biomed Res Int*. 2020;2020:9308341. doi:10.1155/2020/9308341.
8. deLima FBF, Abalem MF, Ruiz DG, Gomes B, deAzevedo MNL, Moraes HV, et al. Prevalence of eye disease in Brazilian patients with psoriatic arthritis. *Clinics (Sao Paulo)*. 2012;67(3):249–53.
9. Karabulut AA, Yalvac IS, Vahaboglu H, Nurozler AB, Duman S. Conjunctival impression cytology and tear-film changes in patients

with psoriasis. *Cornea*. 1999;18(5):544–8.
10. Aragona E, Rania L, Postorino EI, Interdonato A, Giuffrida R, Cannavò SP, et al. Tear film and ocular surface assessment in psoriasis. *Br J Ophthalmol*. 2018;102(3):302–8.
11. Pflugfelder SC, DePaiva CS. The Pathophysiology of Dry Eye Disease: What We Know and Future Directions for Research. *Ophthalmology*. 2017;124(11S):S4–S13.
12. Doughty MJ. Rose bengal staining as an assessment of ocular surface damage and recovery in dry eye disease-a review. *Cont Lens Anterior Eye*. 2013;36(6):272–80.
13. Maurya RP, Gupta A, Verma S, Singh VP, Singh A, Singh V, et al. Sex hormone and dry eye disease: Current update. *Indian J Clin Exp Ophthalmol*. 2018;7(2):139–50.
14. Kharolia A, Parija S, Moharana B, Sirka CS, Sahu SK. Ocular manifestations in moderate-to-severe psoriasis in India: A prospective observational study. *Indian J Ophthalmol*. 2022;70(9):3328–32.
15. Sativada L, Vudayana D, Chintada D, Vudayana K, Sappa R. Ocular Manifestations in Psoriasis Patients Attending a Tertiary Care Centre, Srikakulam, Andhra Pradesh, India: A Cross-sectional Study. *J Clin Diagn Res*. 2022;16(11):NC12–5.
16. Abbagani S, Kamath YS, Nayak S. A Study on Ocular Morbidity among Patients with Psoriasis Visiting a Tertiary Care Hospital in Karnataka, Southern India. *Ocul Immunol Inflamm*. 2019;27(4):531–4.
17. Titiyal JS, Falera RC, Kaur M, Sharma V, Sharma N. Prevalence and risk factors of dry eye disease in North India: Ocular surface disease index-based cross-sectional hospital study. *Indian J Ophthalmol*. 2018;66(2):207–11.
18. Shah S, Jani H. Prevalence and associated factors of dry eye: Our experience in patients above 40 years of age at a Tertiary Care Center. *Oman J Ophthalmol*. 2015;8(3):151–6.
19. Singh S, Maurya RP, Singh V, Manisha, Gupta A, Singh VP, et al. Dry eye diseases associated with primary Sjogren Syndrome: An update. *Indian J Clin Exp Ophthalmol*. 2021;7(2):259–69.
20. Aryanian Z, Shirzadian A, Hatami P, Roostayi GA, Najafi S, Goodarzi A. Ocular manifestations of psoriasis: An inflammatory disease beyond the skin. *J Gen Fam Med*. 2023;24(1):45–9.
21. Taheri AR, Allahyari E, Zeinaly M, Nikandish M. The study of dry eye and meibomian glands in psoriasis. *Eur J Ophthalmol*. 2022;32(2):853–8.

Author biography

Kanchan Bala Rathore, Assistant Professor https://orcid.org/0009-0005-2655-548X

Kiran Jagannath Dange, Assistant Professor https://orcid.org/0000-0002-7553-3413

Praneet Awake, Assistant Professor https://orcid.org/0000-0001-9727-5729

Cite this article: Rathore KB, Dange KJ, Awake P. The prevalence of dry eye in patients with psoriasis attending a tertiary care hospital in western Maharashtra. *Indian J Clin Exp Ophthalmol* 2024;10(1):80-84.