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ORIGINAL ARTICLE

Ocular manifestations of psoriasis: An inflammatory disease beyond the skin

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Abstract

Background: Psoriasis is a chronic inflammatory disorder, mainly involves skin.

Aims: To evaluate the prevalence of ocular manifestations in Iranian patients with psoriasis, compared to healthy controls.

Materials and methods: Forty psoriasis patients and 40 age- and gender-matched healthy controls were enrolled in the study and underwent a comprehensive ophthalmologic assessment.

Results: Only meibomian gland dysfunction was significantly more common among patients with psoriasis, compared to control group (p value: 0.011). Regarding intraocular pressure (IOP), the mean values for both patients and healthy controls were within the normal range and mean IOP in patients was even lower than normal controls, although this difference was significant only for left eye (p value: 0.049). A strong positive correlation between PASI and tear meniscus height for both right and left eyes (p value: 0.005, r: 0.44 for OD and p value: 0.003, r: 0.46 for OS.) was noted. Meibomian gland dysfunction was also positively correlated with disease duration for right and left palpebras (p: 0.04, r: 0.31 for both).

Conclusion: Psoriasis can lead to meibomian gland dysfunction, especially in patients with long-lasting disease. Hence, dermatologists and general practitioners should be vigilant in this regard when visiting psoriasis patients, especially those who have higher PASI values or long-lasting disease.

KEYWORDS
dry eye syndrome, meibomian gland dysfunction, ocular manifestation, psoriasis, psoriasis area severity index

1 | INTRODUCTION

Psoriasis is an immune-mediated disorder mainly involves skin, nail, and joints. However, it can lead to several systemic complications including cardiovascular, metabolic, and psychiatric problems.[1–3] Previous studies have shown some ocular manifestations in patients with psoriasis, especially those with arthropathic or pustular variants of the disease.[4–6]

The most frequent ocular manifestations among psoriasis patients are keratoconjunctivitis sicca (dry eye syndrome), nonspecific conjunctivitis, blepharitis, cataract, and uveitis.[4,6,7]

Ophthalmologic involvement could be due to systemic and inflammatory nature of disease as well as using some treatments such as methotrexate, acitretin, biologic drugs, and phototherapy.[8,9]

Since ocular manifestations are often mild and nonspecific, they could be easily neglected which might be one of the explanations of wide range of their incidence rate from 10% to 58% in various studies.[8,10,11]

Ocular manifestations in psoriatic patients have been shown to be always preceded by cutaneous lesions.[12] Hence, dermatologists and general practitioners could be considered as sentinel physicians, screening patients for presentations needed further evaluations.

Since some discrepancies in results of previous studies were found regarding the prevalence and also risk factors of ocular involvement in psoriasis patients, this study aimed to evaluate the incidence of various ocular manifestations in Iranian patients with psoriasis and compare it with normal population. The association of demographic and clinical characteristics of patients with ocular manifestations was also dealt with.

2 | MATERIALS AND METHODS

This was a prospective cross-sectional study that evaluated 40 patients with confirmed diagnosis of psoriasis referred to the out-patient dermatology clinic of a referral hospital in Iran from January 2018 to July 2018. Forty healthy age- and gender- matched controls were also selected from healthy volunteers among companions of patients attending the out-patient clinic. The following recruitment criteria were used:

Inclusion criteria:

- Those with confirmed diagnosis of psoriasis for patient group and healthy subjects for control group.
- Willing to participate in the study.

Exclusion criteria:

- Subjects with any known dermatologic or systemic disorders (except for psoriasis for patient group).
- Those who received any systemic treatment or phototherapy during last 6 months.
- Those with any personal or familial history of ocular disorders.

This study was approved by the local research ethics committee. After signing informed written consent by all participants, they were subjected to a thorough review of the demographic and clinical characteristics of psoriasis (only patients) including disease duration, severity of disease based on calculated psoriasis area severity index (PASI), clinical subtype of psoriasis, and site of involvement.

Then, all of participants were referred to the ophthalmology department for a comprehensive ophthalmologic assessment including best corrected visual acuity (BCVA) on EDTRs charts, slit lamp bio microscopic examination with indirect fundoscopy, applanation tonometry, Schirmer test, and Tear Film Break Up Time (TBUT). Only one eye per subject was enrolled in the study. All tested values for patients and controls were recorded and analyzed using SPSS version 25 (SPSS Inc, Chicago, IL, USA). The unpaired t-test, chi-square, Mann–Whitney, and Fisher exact tests were performed depending on the type of variants and distribution of their values. A p value of <0.05 was considered statistically significant.

3 | RESULTS

A total of 80 eyes of 40 patients and 80 eyes of 40 healthy control were evaluated. Psoriasis patients and controls had a mean age of 45.38 ± 16.42 and 41.85 ± 14.96 years, respectively. A summary of demographic and clinical characteristics of participants in both groups is provided in Table 1.

Sixty percent of patients (24 vs 16) and 55% of control participants (22 vs 18) were female (Table 1).

TABLE 1 Demographic and clinical characteristics of patients and healthy controls

	Patient	Control	*p* value
Mean age (Year)	45.38 ± 16.42	41.85 ± 14.96	0.31
Gender, *N* (%)			
Female	24 (60%)	22 (55%)	0.65
Male	16 (40%)	18 (45%)	
PASI, *N* (%)			
<7	29 (72.5%)		
7–12	9 (22.5%)		
>12	2 (5%)		
Nail involvement, *N* (%)			
Yes	8(20%)		
No	32 (80%)		
Disease duration, *N* (%)			
<24 months	17 (42.5%)		
24–60 months	11 (27.5%)		
>60 months	12 (30%)		
Clinical type, *N* (%)			
Localized plaque	32 (80%)		
Generalized plaque	4 (10%)		
Guttate	1 (2.5%)		
Palmoplantar	3 (7.5%)		

There was not any statistically significant difference between two groups in terms of age and gender (*p* values: 0.31 and 0.65, respectively).

In patient group, the mean disease duration was 5.1 years, ranged from 1 month to 45 years and the mean PASI was 4.37 (0.4–14.4).

The result of ophthalmologic investigation of participants is reported in Tables 2 and 3.

As seen from the tables, only meibomian gland dysfunction was significantly more common among patients with psoriasis, compared to control group (*p* value: 0.011).

Best corrected visual acuity and tear meniscus height in patients were similar to those in control group: *p* values for O.D. (oculus dexter or right eye): 0.12 and 0.62 and *p* values for O.S. (oculus sinister or left eye): 0.92 and 0.77, respectively (Table 2).

Based on the Schirmer and TUBT tests, there was not any significant difference between patient and control group regarding abnormal dry eye signs (Table 3).

Regarding intraocular pressure (IOP), the mean values for both patients and healthy controls were within the normal range. Surprisingly, mean IOP in patients was even lower than normal controls, although this difference was significant only for O.S. (*p* value: 0.049).

Several subgroup analyses were done evaluating the relationship between various clinical characteristics of psoriasis patients and their ocular symptoms. We found a strong positive correlation between PASI and tear meniscus height for both right and left eyes (*p* value: 0.005, *r*: 0.44 for OD and *p* value: 0.003, *r*: 0.46 for OS.). Meibomian gland dysfunction was also positively correlated with disease duration for right and left palpebras (*p*: 0.04, *r*: 0.31 for both). No other significant correlation was found.

4 | DISCUSSION

Meibomian glands are large sebaceous glands located in the tarsal plates of the eyelids. Meibomian gland dysfunction cause abnormality in tear formation leading to abnormal dryness of eyes. Dry eye disease (DED) is the most common ocular surface disease, which considered a serious and growing public health issue due to its high prevalence worldwide.[13] Patients with this problem experience several symptoms and visual impairment might lead to a reduced quality of life pertaining to vision-related tasks or ocular surface damage.[14]

Dry eye disease is a multifactorial disease with several known risk factors such as Asian ethnicity, female gender, and older age.[13] Previous researches have shown its higher prevalence in patients with psoriasis. In fact, psoriasis has shown not to be merely a cutaneous disorder, but other organs can be affected by a systemic inflammation. Ocular involvement, especially corneal manifestations in psoriasis may have been underestimated by clinicians and has not been extensively studied. Reported incidence rate of ocular manifestations in patients with psoriasis varied from 10% to 58%.[8,10,11] In our study, only meibomian gland dysfunction was noted to be

TABLE 2 Results of ophthalmologic clinical examination

	Patient	Control	*p* value
Palpebral involvement, *N*			
Meibomian Dysfunction			
+	6	0	0.011
–	34	40	
Belepharitis			
+	4	10	0.077
–	36	30	
Conj involvement, *N*			
Pinguicula			
+	6	6	1.00
–	34	34	
Pterygium			
+	1	1	1.00
–	39	39	
Chronic conjunctivitis			
+	2	0	0.152
–	38	40	
Lenz involvement, *N*			
Cataract			
+	3	3	1.00
–	37	37	
Retinal involvement, *N*			
Stuttgart disease			
+	1	0	1.00
–	39	40	
Episcleritis, *N*			
+	3	5	0.45
–	37	35	
Tear meniscus height, Mean (SD)			
OD	0.895 ± 0.32	0.925 ± 0.21	0.62
OS	0.908 ± 0.31	0.925 ± 0.21	0.77
Visual acuity, Mean (SD)			
OD	0.11 ± 0.91	0.07 ± 0.94	0.12
OS	0.12 ± 0.63	0.12 ± 0.93	0.92
IOP, Mean (SD)			
OD	14.55 ± 1.3	15.13 ± 1.55	0.07
OS	14.68 ± 1.26	15.13 ± 1.52	0.049
Schirmer test, Mean (SD)			
OD	13 ± 5	15 ± 5.5	0.47
OS	13 ± 5	14.5 ± 5.5	0.47
TBUT, Mean(SD)			
OD	10 ± 3.5	11 ± 3	0.36
OS	9.5 ± 3.5	11 ± 3	0.17

TABLE 3 Comparison of abnormal values of Schirmer and TUBT tests among participants

		Patient	Control	*p* value
Schirmer Test value, *N*	Normal	32	35	0.363
	Abnormal	8	5	
TUBT value, *N*	Normal	28	31	0.446
	Abnormal	12	9	

significantly more prevalent in psoriasis patients, compared to healthy control group (15% vs 0%).

It is worthy to note that the adopted guidelines from the "Tear Film and Ocular Surface Society (TFOS) Dry Eye Workshop (DEWS)" and the "International Workshop on Meibomian Gland Dysfunction, 2010" criteria were used for defining meibomian gland dysfunction in this study.[15]

Though chronic conjunctivitis and Stargardt disease were also more common in patient group, the difference did not reach to the level of significance. These results were in line with previous studies which did not report any significant difference in incidence of cataract, uveitis, and macular edema in psoriasis patients, compared to normal population.[8,10,16]

We found that the tear film function was not significantly altered in psoriasis patients, although impaired TBUT and Schirmer test values were more likely to be seen in patients compared to the control group. We also found a significant negative correlation between disease severity based on PASI values and tear meniscus height. Dry eye syndrome and blepharitis were previously reported as the most frequent ocular findings in patients with psoriasis.[10,16] The incongruent results might be due to the fact that the majority of our patients had mild psoriasis with low PASI scores. Another explanation could be the concerning air pollution in Iran which has been proved to have a direct effect on corneal surface, leading to dry eye syndrome in normal population.[17] Based on our results, 22.5% and 30% of controls and patients, respectively, had abnormal TBUT values which seems to be much higher than normal values.[18] This may have influenced our results and biased them toward a smaller difference between controls and patients.

Consistent with previous reports, we found that ocular findings were significantly associated with PASI score and disease duration.[8,19] However, there was not any significant association between nail involvement and ocular findings which was previously suggested as a predictive factor of ocular involvement in psoriasis.[20] We could not either evaluate the predictive value of arthropathy for ocular involvement in psoriasis due to lack of articular involvement in our patients. Our findings suggest that corneal involvement should be specially considered in psoriasis patients with long-lasting and severe disease. However, other forms of ocular involvement such as cataract or uveitis have been shown to be more frequent in older patients and those with psoriatic arthropathy, respectively.[18,21] It should be noted that apart from the direct effect of inflammatory and immune-mediated process in psoriasis, medications used for disease may also lead to ocular manifestations.[11]

An interesting finding of this study was the lower IOP in patients, compared to healthy controls. We could not find any reason for that and it might be merely an incidental finding, but we suggest conducting future studies to shed more light on this issue and clarify if psoriasis could be considered as a protective factor for glaucoma.

We could not find any association between ocular manifestation and clinical type of psoriasis which might be due to insufficient number of cases of different clinical types and also absence of some types such as pustular or erythrodermic variants which have been shown to be associated with severe dry eye syndrome in psoriasis patients.[4]

Our study was limited by its small sample size which did not let us have enough patients with various clinical types and severity to evaluate the effect of these factors with ocular involvement. Future prospective studies with a larger sample size are needed to further address this issue.

5 | CONCLUSION

Psoriasis can lead to dry eye disease, especially in patients with long-lasting disease. Hence, clinicians should be vigilant when visiting psoriasis patients, especially those who have higher PASI values or long-lasting disease and refer them to a tailored ophthalmologist for screening and early detection of potential ocular involvement.

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CONFLICT OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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