Research Article

Ocular Manifestation in Psoriasis

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Abstract

Purpose: Psoriasis is a chronic autoimmune and systemic disease characterized by red and scaly plaques, affecting about 1% of the global population. Ocular involvement is becoming increasingly recognized as a complication of the disease. This study aims to evaluate ocular manifestations' prevalence in psoriasis patients.

Methods: We conducted a prospective observational study of patients attending the outpatient department of dermatology in a multidisciplinary tertiary care hospital in South India. A total of 78 patients were enrolled in this study. Ocular symptoms, Schirmer's test, tear breakup time, and intraocular pressure were assessed. The study used the psoriasis area and severity index (PASI) score to quantify the severity of lesions based on the area involved and the appearance of the plaque.

Results: The mean age of the patients was 48.5 ± 12.87 years. The mean duration of psoriasis was 4.8 ± 4.6 years. Ocular manifestations were more common in patients with PASI score >10 when compared to patients with PASI score ≤10. Among the patients with PASI score >10, 55 (70%) had ophthalmic manifestations such as cataracts, dryness, blepharitis, and tear breakup time. There was a statistically significant association between the PASI score and the prevalence of dry eye and blepharitis (*p-value* is 0.007 by Fischer exact test). There was no statistical significance in relation to the duration of disease and ophthalmic manifestations in our study population.

Conclusions: Symptoms of dry eye are a significant part of the clinical manifestations of the disease. Moreover, uveitis is a potentially serious complication in patients presenting with psoriatic arthritis.

Keywords: Psoriasis, Dry eye, Uveitis, Ocular manifestations, Severity.

Introduction

Psoriasis is a chronic autoimmune and systemic disease characterized by well-defined red and scaly plaques involving almost 1–3% of the population worldwide.[1] The pathophysiology has been regarded as a TH1-mediated cellular dysfunction, which causes systemic inflammation and increased cytokine production. Ocular involvement is being increasingly recognized as a complication of psoriasis, affecting 10% of total cases.[2-4] The ocular involvement can be caused by the direct involvement of psoriatic lesions to the ocular tissue or complication of psoriasis treatment.[2] Various ocular structure involvement has been reported in psoriasis. The commonest ocular manifestations are dry eye and blepharitis. Others include uveitis, keratoconjunctivitis sicca, keratitis, corneal abscess, cataract, orbital myositis, symblepharon, Brown's syndrome, trichiasis, cicatricial ectropion, and madarosis. Uveitis is most commonly associated with psoriatic arthritis.[3-5]

Since the ocular manifestations of psoriasis are subtle, they can be easily overlooked without a proper, systematic and dedicated ocular examination. The ocular manifestations also appear much later than the skin manifestations. Surveys into the quality of life implications of psoriasis mostly do not give importance to ocular symptoms.[2] Ophthalmic examinations carried out at regular intervals will help detect early eye changes. Since there are not many studies demonstrating ocular manifestations in psoriasis, we undertake the study to evaluate the prevalence of ocular manifestations in patients with psoriasis and to determine the relationship.

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Materials and Methods

We conducted a prospective, descriptive, cross-sectional study with patients attending the outpatient Department of Dermatology in a Multidisciplinary Tertiary Care Hospital in South India. The study approval was obtained from the Institutional Ethics Committee (IEC) and followed tenets of the Declaration of Helsinki. Informed written content was taken from all the participants. The sample size was estimated by using the standard formula for estimating the proportion with absolute precision. Patients less than 18 years, associated with diabetes mellitus, renal disorder, hepatic disorder and other diagnosed skin diseases were excluded from the study. Detailed examination, including medical history, systemic examination and ocular examination, was done for every patient. Patient characteristics, such as age, sex, duration of disease, type of psoriasis, area of skin involvement, and treatment history, was noted.

The psoriasis area and severity index (PASI) score is a scale for quantifying the severity of lesions based on the area involved and the appearance of the plaque.[6] The body is divided into head, arms, trunk, and legs. Every section is scored by itself, and four scores are combined to calculate the final PASI. The percentage area of skin involved for every section is estimated and converted into a grade 0 to 6. Three clinical signs estimate the severity within each area: erythema, induration and desquamation. The above 3 severity parameters are summed up for each section of skin, multiplied by area score and by weight of the section of the body (0.1 for head, 0.2 for arms, 0.3 for body and 0.4 for legs).

A complete ophthalmic examination including uncorrected visual acquity (UCVA), best-corrected visual acquity (BCVA), slit lamp examination to assess the anterior segment to rule out blepharitis, lid abnormalities, conjunctival xerosis, corneal pathologies including superficial punctate keratitis, corneal melting, opacities, acute anterior uveitis, cataract. The cataract evaluation was done based on the lens opacities Classification System III.[7] Intraocular pressure was measured by Goldman applanation tonometry (GAT) and dilated fundus examination was done with indirect ophthalmoscope to find out any posterior segment pathology.

Dry eye evaluation was done based on (1) OSDI; (2) Tear film break up time (TBUT), (3) Schirmer I & II test, (4) Tear meniscus height (TMH), (5) Corneal fluorescein staining (CFS). The ocular surface disease index (OSDI) was used to assess ocular symptoms of dry eye and it works on a 5-point scale, such as: never, 0; sometimes, 1; half the time, 2; most of the time, 3; all the time, 4. The 12 questions are sub-scaled into 3 categories: vision-related function (6 questions), ocular symptoms (3 questions), and environmental triggers (3 questions).[8] The stability of the tear film (TBUT) over the conjunctiva and cornea was assessed using slit lamp with a cobalt blue filter and sodium fluorescein. A drop of 2% sodium fluorescein was applied to the eye, and the patient was asked to blink five times to form a film over the

Table 1: Baseline demographics of all the patients

Parameter		*Total no psoriasis patients (n=78)*	*No of patients with ocular manifestations(n=55)*
Gender (Male/Female)		62/16	43/12
Age	Mean ± SD	48.5 ± 12.8	
Range		21- 75 years	
Age distribution	0-20 years	0	0
	21-40 years	21	13
	41-60 years	42	31
	61-80 years	15	11
	> 80 years	0	0
Duration of disease (in years)	< 5 years	54	35
	5-10 years	17	14
	> 11 years	7	6
Type of psoriasis	Plaque	47	32
	Guttate	13	8
	Erythrodermic	12	10
	Pustular	4	3
	Psoriatic arthritis	2	2
Type of Treatment	Methotrexate	65 (130 eyes)	40 (61%)
	Topical steroids	4 (8 eyes)	3 (75%)
	Cyclosporine	2 (4 eyes)	1 (50%)
	Topical tar	7 (14 eyes)	1 (14%)

Table 2: Distribution of psoriasis with ocular manifestations based on the PASI score

PASI SCORE	*Total no psoriasis patients (n)*	*Patients with ocular manifestations (n)*	*Patients with dry eye (n)*
<5	8	7	4
5-10	41	24	8
>10	29	24	18
Total	78	55	30

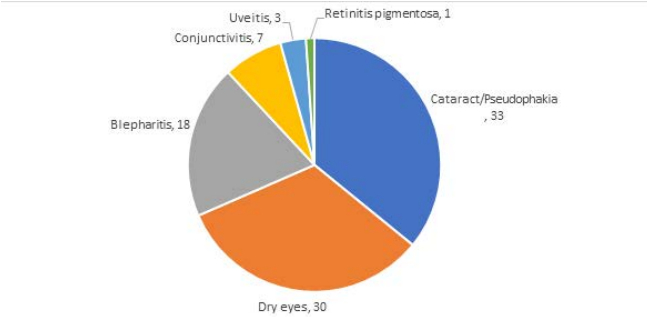

Figure 1: Distribution of patients with various ocular manifestations

cornea and bulbar conjunctiva. The interval between the last blink and the first randomly distributed dry spot was taken as the tear breakup time. A value of less than 10 seconds was taken as abnormal.[9] The Schirmer I test was performed without anesthesia by applying a 35 x 5 mm Whatman No. 41 filter paper strip to the lower temporal lid margin; less than 10 mm in 5 minutes was considered abnormal. Schirmer II was performed similarly with topical anesthesia (1% Proparacaine) instilled in the lower fornix 1-minute before the procedure and values less than 5 mm were considered significant. Tear meniscus height (TMH) was measured by modifying the vertical length of slit beam on the tear meniscus at the centre of the lower lid and the readings were noted from the slit lamp scale. CFS was conducted to assess ocular surface damage with sterile standard strips and the intensity of the zones of conjunctiva and cornea (central, superior, temporal, inferior, and nasal) was graded from 0 (none) to 4 (severe), according to the Oxford Scheme for ocular surface staining.[10] Diagnosis of dry eye was considered in case of OSDI score ≥ 33, ST-I ≤ 10 mm, TBUT ≤ 10 secs, TMH ≤ 0.3 mm and CFS score ≥ 3. Data were analyzed using the software statistical package for social science (version 20; SPSS Inc., Chicago, Illinois, USA). A frequency distribution with its percentage and descriptive statistics with mean and SD were calculated. χ^2-Test, unpaired t-test, and correlations were performed whenever needed.

Results

A total of 78 patients based on the inclusion and exclusion criteria attending the psoriasis clinic in our hospital were included in the study. Patient characteristics such as age, gender and disease characteristics such as duration of disease,

Table 3: Dry eye parameter values with respect to the severity of psoriasis (PASI SCORE)

PASI SCORE	*Schirmer I*	*Schirmer II*	*TBUT*
<5	17 ±7.6	11.3 ± 4.53	9.75 ±1.13
5-10	11.43 ±4.57	8.7 ± 4.40	7.45 ±2.39
>10	10.3±4.01	7.9 ± 3.94	7.45 ± 2.39

type of psoriasis, type of treatment are given in Table 1. The mean age of the patients was 48.5 ± 12.87 years, ranging from 21 to 75 years. Majority of the patients in the study were in the age group of 41-60 years. The mean duration of psoriasis in our study population was 4.8 ± 4.6 years. Majority of patients had disease duration of less than 5 years. There was no statistical significance between duration of disease and ocular manifestations of psoriasis (p=0.18). The distribution of psoriasis with ocular manifestations based on the PASI score is given in Table 2. The frequency of various ocular manisfestations among psoriasis patients are given in Figure 1. Ocular manifestations were more common in patients with PASI score >10 when compared to patients with PASI score ≤10 and this difference was statistically significant (p-value is 0.007 by Fischer exact test) (Table 3).

Discussion

Psoriasis is a chronic inflammatory disorder that commonly manifests with various extra-cutaneous manifestations, of which eye involvement is important. Ocular manifestations, such as blepharitis, keratoconjunctivitis sicca, conjunctivitis, keratitis, cataracts and uveitis have been observed in about 30% of patients with psoriasis.[3] We screened the psoriasis patients attending the outpatient Department of Dermatology for associated ocular manifestations. Out of 78 patients studied, 55 (70%) had ocular manifestations such as cataract (n = 33), dryness (n = 30), blepharitis (n = 18), conjunctivitis (n = 7) and uveitis (n = 3). Studies done by Chandran *et al.*[2] and Erbagci *et al.*[11] in Turkey had found the prevalence of ocular manifestations in psoriasis to be 67 and 65%, respectively, which were in congruence with the present study, which showed a prevalence of 70%. The duration of psoriasis in our study did not play a role in ocular manifestations of psoriasis. There was an increase in the proportion of patients with ocular manifestations with increase in the duration of disease but was of no statistical significance in relation to the duration of disease and ocular manifestations.

Cataract has been reported to be the most important cause of visual impairment in psoriasis patients.[1] Chatterjee *et al.*[12] in their Punjab study, the prevalence of cataracts was 1% in age group 30 to 49 years and Nirmalan *et al.*[13] in their study showed 15.7% had cataracts among age group 40 to 49 years. Wanscher *et al.*,[14] in their study of 266 psoriasis patients with mean age of 24.7 years, found that the incidence of cataract among psoriasis patients does not exceed the normal population; hence concluded saying routine eye examinations for cataract are not necessary for such patients. In our study, in the age group less than 40 years, 10% of patients with psoriasis

had cataracts. In the age group 41 to 60 years, 38% of psoriasis patients had cataracts. Hence it is essential to examine every patient with psoriasis with history of diminution of vision for the presence of cataracts.

In their study, Lima *et al.*[1] found abnormal Schirmer test in 50% of psoriasis patients along with 67% abnormality in tear breakup time. Her *et al.*[15] have showed a higher tear film instability and significant degeneration on the ocular surface in patients with psoriasis. Lambert *et al.*[3] in a study of patients with psoriatic arthritis, noted ocular inflammation in 30% of cases. Kilic *et al.*[16] noted Schirmer test and tear break-up time values to be statistically lower in the patient group than those in the control group. Karabulut *et al.*[17] demonstrated a higher incidence of neutrophil clumping, squamous metaplasia and nuclear chromatin changes in patients with psoriasis. However, in our study the prevalence rate was 36% and this maybe under-estimation because of rigid diagnostic criteria to classify dry eye (Schirmer I <15 and Schirmer II <10). In addition, there is a poor relationship between the signs and symptoms of dry eye.[18] Therefore, there could be a greater number of cases of dry eye which have been unnoticed.

Blepharitis usually presents with itching and burning sensation associated with red swollen lids and crusted and flaky scales covering the lashes. It is one of the most common ocular manifestations in psoriasis. Erbagci *et al.*[11] showed 65% prevalence of blepharitis in psoriasis patients, whereas in our study, it was found only in 23% of cases. Campanati *et al.*[19] observed that the ocular symptoms, Schirmer's test and tear break-up time improved after 12 weeks of immunosuppressant drugs. Hence the lesser prevalence of blepharitis (23%) in the present study may be attributed to the immunosuppressant drugs, methotrexate and cyclosporine. In our study, 69 out of 78 patients received or received methotrexate or cyclosporine as primary treatment for psoriasis.

Usually, ocular symptoms can present as chronic non-specific conjunctivitis, secondary to dry eyes, blepharitis and can lead to xerosis, trichiasis and symblepharon formation etc.[20] Kaldeck *et al.* reported 11 cases of conjunctivitis out of 90 psoriasis patients, whereas Ingram *et al.* stated that conjunctivitis and psoriasis was fortuitous.[21] In our study, we found the prevalence of conjunctivitis to be more than the prevalence in the general population.[17] The manifestations in cornea in psoriasis patients range from punctate keratitis to filaments, epithelial thickening, recurrent erosions, vascularization, ulceration, melting and scarring. None of the patients in the present study had corneal manifestations except for arcus senilis, which is age-related change.

Uveitis is a potentially serious complication in patients with psoriasis. It is the most common ocular manifestation along with psoriatic arthritis with a prevalence rate of 20%.[22] Wollina *et al.*[23] in their study observed that anterior uveitis is temporarily seen in about one-quarter of psoriatic arthritis patient. Villani *et al.*[24] described that 7% patients with psoriatic arthritis have anterior uveitis. Twenty-six episodes of irido-cyclitis were recorded at diagnosis in 22 out of 242 patients with psoriatic arthritis by Niccoli *et al.*[25] and they concluded that uveitis has been frequently underdiagnosed. In addition, Villani *et al.*[24] inferred that up to 29% of patients with psoriasis have undiagnosed psoriatic arthritis. In our study, 3 patients had uveitis, out of which one had psoriatic arthritis. Hence, patients even without symptoms of joint pain or known cases of psoriatic arthritis should be examined for uveitis and in psoriasis patients with uveitis, investigations for psoriatic arthritis may be necessary.

The cause of increase in intraocular pressure in patients with psoriasis is due to the use of topical corticosteroids for psoriasis lesions, especially for facial and eyelid lesions. The mechanism of action of raised IOP is by membrane stabilizing action causing accumulation of glycosaminoglycans in the trabecular meshwork resulting in outflow resistance.[26] Intraocular pressure was in our study's normal range (16 ± 3 mm of Hg). The use of topical corticosteroids had not resulted in increase in intraocular pressure nor development of glaucoma. In a study by Chandran *et al.*,[2] three eyes (2% prevalence) had glaucomatous optic neuropathy unrelated to the previous treatment and were comparable with the expected population frequency. The mean intraocular pressures in psoriasis patients were normal in the study done by Lima *et al.*[1] also.

Okamoto *et al.*[27] showed that the flare value was higher in patients with PASI scores greater than 10 and those older than 40 years. In another study conducted in by Okamoto *et al.* in Japan, it was found that the aqueous flare value was higher in patients with longer duration of disease and higher in patients with severe psoriasis (PASI score > 10). However, in our study, we had not assessed the aqueous flare value, but we had observed that the ocular manifestations were more likely to occur among patients with higher disease severity. An increase in the prevalence of dry eyes was noted in patients with higher PASI score.

Conclusion

Ocular manifestations are a significant part of the psoriasis manifestations. Dry eye and blepharitis are the most common ocular manifestations. There was a significant association between the PASI score and ocular manifestations. The greater the score, more common and severe are the ocular manifestations.

References

1. Lima FB, Abalem MF, Ruiz DG, Gomes Bde A, Azevedo MN, Moraes HV Jr, Yeskel AS, Kara-Junior N. Prevalence of eye disease in Brazilian patients with psoriatic arthritis. Clinics (Sao Paulo). 2012;67(3):249-53
2. Chandran NS, Greaves M, Gao F, Lim L, Cheng BC. Psoriasis and the eye: prevalence of eye disease in Singaporean Asian patients with psoriasis. J Dermatol. 2007 Dec;34(12):805-10
3. Lambert JR, Wright V. Eye inflammation in psoriatic arthritis.

Ann Rheum Dis. 1976 Aug;35(4):354-6
4. Kammer GM, Soter NA, Gibson DJ, Schur PH. Psoriatic arthritis: a clinical, immunologic and HLA study of 100 patients. Semin Arthritis Rheum. 1979 Nov;9(2):75-97
5. Catsarou-Catsari A, Katsambas A, Theodoropoulos P, Stratigos J. Ophthalmological manifestations in patients with psoriasis. Acta Derm Venereol. 1984;64(6):557-9
6. Meier M, Sheth PB. Clinical spectrum and severity of psoriasis. Curr Probl Dermatol. 2009;38:1-20
7. Chylack LT Jr, Wolfe JK, Singer DM, Leske MC, Bullimore MA, Bailey IL, Friend J, McCarthy D, Wu SY. The Lens Opacities Classification System III. The Longitudinal Study of Cataract Study Group. Arch Ophthalmol. 1993 Jun;111(6):831-6
8. Schiffman RM, Christianson MD, Jacobsen G, Hirsch JD, Reis BL.Reliability and validity of the Ocular Surface Disease Index. Arch Ophthalmol. 2000 May;118(5):615-21.
9. Lemp MA, Foulks GN. The definition and classification of dry eye disease. Ocul Surf. 2007;5(2):75-92.
10. Bron AJ, Evans VE, Smith JA. Grading of corneal and conjunctival staining in the context of other dry eye tests. Cornea. 2003 Oct;22(7):640-50
11. Erbagci I, Erbagci Z, Gungor K, Bekir N. Ocular anterior segment pathologies and tear film changes in patients with psoriasis vulgaris. Acta Medica Okayama. 2003;57(6):299-303.
12. Chatterjee A, Milton RC, Thyle S. Prevalence and aetiology of cataract in Punjab. Br J Ophthalmol. 1982 Jan;66(1):35-42.
13. Nirmalan PK, Krishnadas R, Ramakrishnan R, Thulasiraj RD, Katz J, Tielsch JM, Robin AL. Lens opacities in a rural population of southern India: the Aravind Comprehensive Eye Study. Investigative ophthalmology & visual science. 2003;44(11):4639-4643.
14. Wanscher B, Vesterdal E. Syndermatotic cataract in patients with psoriasis. Acta Dermato-venereologica. 1976;56(5):397-399.
15. Her Y, Lim JW, Han SH. Dry eye and tear film functions in patients with psoriasis. Jpn J Ophthalmol. 2013 Jul;57(4):341-6.
16. Kilic B, Dogan U, Parlak AH, Goksugur N, Polat M, Serin D, Ozmen S. Ocular findings in patients with psoriasis. Int J Dermatol. 2013;52(5):554-559.
17. 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):544-548.
18. Nichols KK, Nichols JJ, Mitchell GL. The lack of association between signs and symptoms in patients with dry eye disease. Cornea. 2004;23(8):762-770.
19. Campanati A, Neri P, Giuliodori K, Arapi I, Carbonari G, Borioni E, Herbort C, Mariotti C, Giovannini A, Offidani A. Psoriasis beyond the skin surface: a pilot study on the ocular involvement. International Ophthalmology. 2015;35(3):331-340.
20. Söker S, Nergiz Y, Cakmak S, Bahçeci S, Aytekin S. The demonstration of changes in bulbar conjunctiva surface epithelium in the psoriatic patients treated with PUVA. Ann Ophthalmol (Skokie). 2008 Summer;40(2):94-8.
21. Ingram JT. The significance and management of psoriasis. British Medical Journal. 1954;2(4892):823.
22. Peluso R, Iervolino S, Vitiello M, Bruner V, Lupoli G, Di Minno MND. Extra-articular manifestations in psoriatic arthritis patients. Clinical Rheumatology. 2015;34(4):745-753.
23. Wollina U, Unger L, Heinig B, Kittner T. Psoriatic arthritis. Dermatol Ther. 2010;23(2):123-136.
24. Villani AP, Rouzaud M, Sevrain M, Barnetche T, Paul C, Richard MA, et al. Symptoms dermatologists should look for in daily practice to improve detection of psoriatic arthritis in psoriasis patients: an expert group consensus. J Eur Acad Dermatol Venereol. 2014 Aug;28 Suppl 5:27-32.
25. Niccoli L, Nannini C, Cassarà E, Kaloudi O, Susini M, Lenzetti I, Cantini F. Frequency of iridocyclitis in patients with early psoriatic arthritis: a prospective, follow up study. Int J Rheum Dis. 2012 Aug;15(4):414-8.
26. Gorgievska Sukarovska B, Lipozencić J. Topical management of psoriasis - corticosteroids and sparing corticosteroid therapy. Acta Dermatovenerol Croat. 2006;14(3):188-96.
27. Okamoto F, Umebayasi Y, Ohtsuka F, Hommura S. Factors associated with increased aqueous flare in psoriasis. Jpn J Ophthalmol. 2001 Mar-Apr;45(2):172-6.