

Ocular Manifestations in Psoriasis Patients Attending a Tertiary Care Centre, Srikakulam, Andhra Pradesh, India: A Cross-sectional Study

LAKSHMI SATIVADA¹, DINESHKANTH VUDAYANA², DILIPCHANDRA CHINTADA³,
KIRANKANTH VUDAYANA⁴, RAMATULASI SAPPA⁵



ABSTRACT

Introduction: Psoriasis is known to be proliferative, relapsing inflammatory disorder affecting mainly skin and other parts of body. There are several co-morbidities associated with psoriasis, of which ocular findings go unnoticed.

Aim: To study the spectrum of ocular manifestations in psoriasis patients in Srikakulam, north coastal region of Andhra Pradesh, India and also to identify relationship between frequency of ocular involvement in psoriasis patients with age, gender, type and severity of psoriasis.

Materials and Methods: The present cross-sectional study was conducted from March 2019 to March 2021 at Great Eastern Medical School and Hospital, Ragolu, Srikakulam, Andhra Pradesh, India. The study included 80 psoriasis patients attending dermatology Outpatient Department (OPD) to know various ophthalmological manifestations. Detailed dermatological examination was done followed by ophthalmological examination.

Clinical types of psoriasis, site of involvement, and the severity of the disease using Psoriasis Area and Severity Index (PASI) were noted. Statistical analysis was done using Z-test, Pearson's correlation coefficient and linear regression coefficient.

Results: Out of 80 patients with psoriasis, 51 (63.75%) were males and 29 (36.25%) were females. Out of total 80 patients, 56 (70%) patients had ophthalmic manifestations. The mean age of presentation was noted to be 49.22±8.53 years with range from 18-76 years. Most of the patients i.e. 30 (54%) had bilateral manifestations in both the eyes. Nearly 10 (18%) of psoriasis patients had multiple ocular manifestations. The p-value was calculated based on PASI score and with ocular manifestations which was found to be 0.0485 and was statistically significant.

Conclusions: Regular screening of psoriasis patients is useful in identification of ocular problems which may not be noticed by the patients until symptomatic.

Keywords: Dry eyes, Inflammatory disease, Ophthalmological disorder

INTRODUCTION

Psoriasis is a long lasting, immunological assisted, proliferative condition of the skin with both genetic and environmental influences [1]. It is a relapsing inflammatory disorder that affects around 0.1%-3% of the global population [2]. However in India, the prevalence of psoriasis varies from 0.44-2.8% [3]. The most characteristic lesions consists of red, scaly, sharply demarcated, indurated plaques present particularly over extensor surfaces and scalp [4]. Various morphological types of psoriasis are chronic plaque type, guttate, pustular, erythrodermic [5]. There are many co-morbidities associated with psoriasis which are included under extracutaneous manifestations. These manifestations include psoriatic arthritis, metabolic syndrome, crohns disease, depression and cancer. Along with this, there are several ocular manifestations which usually go unnoticed [6].

Many number of ocular findings have been described in psoriasis patients and have been reported to occur in 10% of patients [7]. Ocular lesions are more common and they often occur during psoriasis exacerbations [8]. Ophthalmic complications of psoriasis are many and tend to occur much later of the skin involvement. The disease affects almost all parts of eye from eyelids, meibomian glands, conjunctiva, cornea, uvea, lens and retina [8].

There were many studies conducted across India and across the world [8-14] to know various ocular manifestations like Shah RD et al., [9] conducted study at Bhubaneswar, Odisha, and Chowdhury B et al., [14] conducted study at Delhi. Till date no such study was done at north coastal region of Andhra Pradesh, India. Hence, present study was conducted in order to know the spectrum of ocular manifestations in psoriasis patients and also to identify

relationship between frequency of ocular involvement with age, gender, type and severity of psoriasis in north coastal region of Andhra Pradesh, India.

MATERIALS AND METHODS

This cross-sectional study was conducted from March 2019 to March 2021 for a period of two years at Great Eastern Medical School and hospital, Srikakulam, Andhra Pradesh, India. The study was approved by Institutional Ethical Committee [IEC number 93-IEC-GEMS&H-2019]. Written informed consent was taken from all the participants before inclusion in the study.

Inclusion criteria: Patients aged >18 years with diagnosis of psoriasis were included in the study.

Exclusion criteria: Patients with diabetes mellitus, chronic kidney disease, ocular trauma, ocular allergy, Steven Johnson syndrome, rheumatoid arthritis, autoimmune or collagen vascular disease like sarcoidosis, systemic lupus erythematosus, behcets disease etc, Patients with contact lens usage and patients using ophthalmic medications or immunosuppressant drugs were excluded from the study.

Sample size: A total of 80 patients with psoriasis attending dermatology OPD within the study duration, were enrolled in the present study by convenient sampling.

After informed consent, detailed clinical dermatological examination were done to confirm the diagnosis of psoriasis by the dermatologist, followed by ophthalmological examination. Clinical types of psoriasis, site of involvement, and the severity of the disease using PASI [15] were noted. This is currently the gold standard score for the assessment of extensive psoriasis. Four sites of affection, head (h), upper limb (u), trunk (t), lower limbs (l), scored

by using three parameters: erythema, induration, desquamation each of which is graded on a severity scale of 0 to 4, where 0=nil, 1=mild, 2=moderate, 3=severe and 4=very severe. The area-wise percentage involvement of the involved sites is calculated as:

- 1= less than 10% area;
- 2= 10-29%; 3=30-49%;
- 4= 50-69%;
- 5= 70-89%; and
- 6= more than 90%.

The final formula for PASI score is:

$$\text{PASI} = 0.1 (E_h + I_h + D_h) A_h + 0.2 (E_u + I_u + D_u) A_u + 0.3 (E_t + I_t + D_t) A_t + 0.4 (E_l + I_l + D_l) A_l$$

E for erythema, I for induration, D for desquamation. The maximum score of PASI is 72

Ophthalmology examination included visual acuity examination using snellens chart [16]. Slit lamp examination include detailed lid examination to rule out blepharitis and mebomitis, conjunctiva examination to rule out conjunctival xerosis, corneal examination to rule out corneal opacities, keratitis and superficial punctate keratitits. Anterior chamber examination was done to rule out active or chronic uveitis changes followed by lens examination to rule out cataract formation. Lacrimal sac syringing was done. Tear film Break Up Time (TBUT) and schirmer's test I [17] were done to identify dry eye disease. TBUT score of < 10 seconds was found to be abnormal and schirmer's I <10 mm was found to be abnormal. Applanation tonometry was done to measure intraocular pressure. Fundus examination was done using 90D lens [9]. All the findings were noted.

STATISTICAL ANALYSIS

Statistical analysis was done using Statistical Package for the Social Sciences (SPSS)-16.0 with mean value, Z test, Chi-square test and linear regression coefficient wherever appropriate. The p-value<0.05 was considered statistically significant.

RESULTS

A total of 80 patients with psoriasis were examined at ophthalmology department to look for various ophthalmological manifestations. Out of total 80 patients 56 (70%) patients had ophthalmic manifestations. Out of 80 patients, with psoriasis, 51 (63.75%) were males and 29 (36.25%) were females. Out of 51 male patients, 39 (76.47%) and out of 29 female patients, 17 (58.62%) had ophthalmic manifestations. The p-value was found to 0.128 which was not significant [Table/Fig-1].

Gender	With ocular manifestations, n (%)	Without ocular manifestations, n (%)	Total patients, n (%)	p-value
Males	39 (76.47)	12 (23.53)	51 (63.75)	0.128
Females	17 (58.62)	12 (41.38)	29 (36.25)	
Total	56 (70)	24 (30%)	80 (100)	

[Table/Fig-1]: Gender distribution of patients with psoriasis. Chi-square test; level of significant p-value <0.05

The mean age of presentation was noted to be 49.22±8.53 years with range from 18-76 years. Most of the patients 49 (61.25%) were in the age group of 25-50 years followed by 50-75 years with 25 (31.25%) patients. The p-value was 0.797 which was found to be non significant [Table/Fig-2].

Patients were divided on the basis of type of psoriasis and ocular manifestations. Out of 80 patients, 62 (77.5%) were with plaque type of psoriasis, 11(13.75%) were with pustular type of psoriasis, 3 (3.75%) each were with erythrodermic type of psoriasis and scalp type of psoriasis and 1 (1.25%) were with guttate type of psoriasis [Table/Fig-3].

Age distribution (years)	With ocular manifestations, n (%)	Without ocular manifestations, n (%)	Total patients, n (%)	p-value
18-25	1 (25)	3 (75)	4 (5)	0.797
25-50	37 (75.5)	12 (24.5)	49 (61.25)	
50-75	16 (64)	9 (36)	25 (31.25)	
>75	2 (100)	0	2 (2.5)	
Total	56 (70)	24 (30)	80	

[Table/Fig-2]: Age distribution of patients with psoriasis. p-value was calculated using Chi-square test

Type of psoriasis	With ocular manifestations	Without ocular manifestations	Total	p-value
Plaque type	43 (53.75)	19 (23.75)	62 (77.5)	1.000
Pustular type	9 (11.25)	2 (2.5)	11 (13.75)	
Erythroderma type	2 (2.5)	1 (1.25)	3 (3.75)	
Scalp type	1 (1.25)	2 (2.5)	3 (3.75)	
Guttate type	1 (1.25)	0	1 (1.25)	

[Table/Fig-3]: Types of psoriasis in patients with or without ocular manifestations. p-value was calculated using Chi-square test

Patients were divided based on PASI score which indicates the severity of the disease. The p-value was calculated based on PASI score and with ocular manifestations which was found to be 0.0485 and was statistically significant [Table/Fig-4].

PASI score	With ocular manifestations	With out ocular manifestations	Total patients	p-value
< 5	3 (3.75)	5 (6.25)	8 (10)	0.0485
5-10	33 (41.25)	14 (17.5)	47 (58.75)	
>10	20 (25)	5 (6.25)	25 (31.25)	
	56 (70)	24 (30)	80 (100)	

[Table/Fig-4]: Severity of psoriasis in patients with or without ocular manifestations. p-value was calculated using Chi-square test

Out of 56 patients with psoriasis, 30 (54%) had bilateral manifestations involving both the eye and 26 (46%) had manifestation in one eye. some of the patients i.e 10 (18%) patients had multiple manifestations and 46 (82%) had single manifestation of psoriasis. [Table/Fig-5] shows the different ophthalmic manifestations in psoriasis patients. No other retinal abnormalities or elevated intraocular pressures were found.

Ophthalmic manifestations	No of patients (%)
Cataract	20 (25)
Dry eyes	14 (17.5)
Conjunctivitis	12 (15)
Superficial punctate keratitis	8 (10)
Blepharitis	8 (10)
Psuedophakia	5 (6.25)
Corneal opacity	3 (3.75)
Mebomitis	2 (2.5)
Trichiasis	2 (2.5)
Uveitis	1 (1.25)
Posterior synechae	1 (1.25)

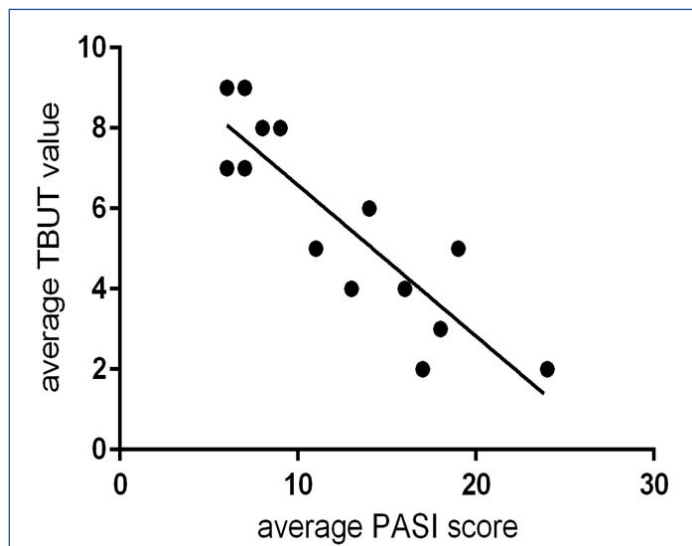
[Table/Fig-5]: Ophthalmic manifestations in psoriasis patients.

In the present study, abnormal TBUT and schirmer's I test value were found in 14 patients. The mean TBUT time was found to be 7.2±0.70 seconds and the mean schirmer's I test value was found to be 8.5±0.60 mm. TBUT time was lower when compared to schirmer's I test. Dry eye patients were divided based on PASI score to find any association between severity of the disease with dry eyes. The P value was found to be 0.1113 which was not significant [Table/Fig-6].

PASI score	Patients with ocular manifestations	Patients with dry eyes	p-value
<5	3 (3.75)	0	0.1113
5-10	33 (41.25)	6 (7.5)	
>10	20 (25)	8 (40)	

[Table/Fig-6]: Dry eye manifestations in patients with psoriasis. p-value was calculated using Chi-square test

Linear regression analysis was done for average TBUT value with average PASI score in patients with dry eyes. A correlation between TBUT and PASI score was found and as the severity of the psoriasis increased with the PASI score the dry eye disease also increased as indicated by TBUT values (r value- 0.7658) [Table/Fig-7].



[Table/Fig-7]: Regression analysis of PASI score with TBUT values.

DISCUSSION

According to present study, the ocular manifestations were found to be present in 70% patients. The % of psoriasis in different studies is shown in [Table/Fig-8] [9-12]. This prevalence rate was more in close with the study conducted by Abbagani S et al., [13] which shows a prevalence rate of 80%. This may be due to geographical variation and less awareness among people and healthcare professionals regarding ophthalmic manifestations in psoriasis patients.

Study name	Place of the study, Publication year	Sample size	% of psoriasis patients with ocular manifestations
Present study	Srikakulam, 2022	80	70
Shah RD et al., [9]	Bhubaneswar, 2021	100	61
Kilic B et al., [10]	Turkey, 2013	100	58
Chandran et al., [11]	Singapore, 2007	100	67
Erbagci I et al., [12]	Turkey, 2003	60	67

[Table/Fig-8]: Comparison of several studies with % of psoriasis patients with ocular manifestations [9-12].

Present study had age group between 18-76 years with mean age of presentation of 49.22±8.53, with higher male preponderance which was in consistent with studies conducted by Campanati A et al., [8], Chandran NS et al., [11] and Abbagani S et al., [13]. Bilateral presentation of ocular manifestations was noted in 54% patients which was found to be similar to study conducted by Kilic B et al., [10] which shows a rate of 58% and 48.6% as per study conducted by Chowdary B et al., [14].

In the present study, 25% patients had cataract which was more common in elderly person. However none of the studies suggest any direct correlation between disease process and development of cataract [11,12]. Chronic non specific conjunctivitis was found in 15% psoriasis patients. Kaldec R et al., [18] reports only 11

cases out of 90 psoriasis patients which was in consistence with present study. This was found to less when compared to study conducted by Shah RD et al., [9] which shows prevalence of 47% and study conducted by Omar SS and Helaly HA [19] which shows a prevalence of 40%. This may be due to inclusion of non specific conjunctivitis ruling out other causes like blepharitis or dry eye leading to conjunctivitis in present study. In the present study blepharitis was found in 10% patients and 2 cases (2.5%) were found to be mebomitis. This prevalence was found to be near to study conducted by Kolli SR et al.,[1] and Shah et al., [9] which shows a prevalence of 27%. The prevalence was found to be lower when compared to studies conducted by Kiliac B et al., [10] (39%), Erbagci I et al., [12] (64.5%), Abbagani S et al., [13] (63%) [Table/Fig-9].

Study name	Place of the study, Publication year	Sample size	% psoriasis patients with blepharitis
Present study	Srikakulam 2022	80	10
Kolli SR et al., [1]	Guntur, 2016	75	27
Shah RD et al., [9]	Bhubaneswar, 2021	100	27
Kiliac B et al., [10]	Turkey, 2013	100	39
Erbagci I et al., [12]	Turkey, 2003	60	64.5

[Table/Fig-9]: Comparison of several studies % psoriasis patients with blepharitis [1,9,10,12].

The second most common manifestation was dry eye and many studies reported that dry eye disease is associated with severity of psoriasis [14,20]. The incidence of dry eye was found to be 17.5% in the present study which was near to study conducted by Chowdhury B et al., [14] which shows a prevalence of 8.6% [Table/Fig-10]. The incidence was found to be variable from 2% to 18% as study conducted by Gudmundsen KJ et al., [20]. The results in the present study were low when compared to study conducted by Shah RD et al., [9] (36%), Kolli SR et al., [1] (37%) and Abbagani S et al., [13] (44.7%). In the present study, lower TBUT time was found when compared to Schrimmer's I as observed by some authors [10,21]. This may be due to decrease in mucin secretion as the disease affects the meibomian glands.

Study name	Place of the study, Publication year	Sample size	% of psoriasis patients with dry eyes
Present study	Srikakulam, 2022	80	17.5%
Kolli SR et al., [1]	Guntur, 2016	75	37%
Shah et al., [9]	Bhubaneswar, 2021	100	36%
Chowdary et al., [14]	Delhi, 2017	70	8.6%

[Table/Fig-10]: Comparison of several studies % of psoriasis patients with dry eyes [1,9,14].

Corneal involvement like SPK, corneal opacities were found secondary to dry eye disease or trichiasis. The most common presentation was found to be SPK in 10% patients with psoriasis which was found to be consistent with Shah RD et al., [9] which shows corneal opacities in 9% patients. Erbagci I et al., [12] found corneal opacities in 4 eyes out of 31 psoriasis patients. Total corneal involvement was found to be in 16.25% cases which was found to be consistent with study conducted by Kiliac B et al., [10]. Uveitis was found in 1 (1.25%) with unilateral involvement and posterior synechiae. None of the patients had any elevated intraocular pressure or retina involvement.

Limitation(s)

This study was conducted at single institution with a small sample size.

CONCLUSION(S)

In present study, cataract and dry eye disease were most common ophthalmic manifestations among patients with psoriasis. Regular

screening of psoriasis patients can be useful in early identification of ocular morbidity. This would be helpful to the patients in early management of the disease and prevention of further complications. As the severity of psoriasis increases the ocular manifestations also increases which can be reduced by regular screening of patients. Multicentric studies should be done to know the correct correlation between the severity of disease and ocular manifestations.

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PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Ophthalmology, GEMS and H, Ragolu, Srikakulam, Andhra Pradesh, India.
2. Associate Professor, Department of Ophthalmology, GEMS and H, Ragolu, Srikakulam, Andhra Pradesh, India.
3. Assistant Professor, Department of Dermatology, Venereology and Leprosy (DVL), GEMS and H, Ragolu, Srikakulam, Andhra Pradesh, India.
4. Associate Professor, Department of Dermatology, Venereology and Leprosy (DVL), GEMS and H, Ragolu, Srikakulam, Andhra Pradesh, India.
5. Associate Professor, Department of Dermatology, Venereology and Leprosy (DVL), KIMS and RF, Amalapuram, Andhra Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Kirankanth Vudayana,
Govinda Nagar, Plot Number 147, Srikakulam-532001, Andhra Pradesh, India.
E-mail: kkmedico12@gmail.com

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