



## A Study of Ocular Manifestations in Psoriasis Patients

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### ABSTRACT

**Aim:** To evaluate the severity of dry eyes in patients suffering with psoriasis and also to study various other ocular manifestations of psoriasis.

**Materials and Methods:** The present hospital based observational study was conducted in Department of Ophthalmology, Mahatma Gandhi Medical College & Hospital, Jaipur along with coordination of Department of Dermatology during April 2021 to June 2022 among 100 patients referred from dermatology department for evaluation of ocular finding in Psoriasis. Duration of disease, type of psoriasis, area of skin involvement, past and current treatment, ocular symptoms were noted. Schirmer's-1, Tear break up time and intraocular pressure were measured. PASI score was calculated for every patient.

**Results:** Ocular manifestations were present in 73 patients of Psoriasis and absent in 27 subjects. In 73 subjects having ocular manifestations, 32 had Cataract, 27 had complain of Dry Eyes, 10 had Blepharitis, 3 patients complained of Chronic conjunctivitis and only one subject had Uveitis. There was a statistically significant positive correlation between duration of psoriasis, PASI score and presence of ocular manifestations. There was an inverse statistically significant correlation present in severity of psoriasis and mean Schirmer values ( $p=0.007$ ). There was a positive statistically significant correlation present in severity of psoriasis and mean OSDI.

**Conclusion:** Psoriasis sufferers should regularly undergo ophthalmic evaluation for the purpose of early diagnosis and management of eye illnesses. The requirement for ophthalmological evaluation at the time of diagnosis and future follow ups should be made clear to the dermatological and medical colleagues who are typically the first to interact with psoriasis patients.

**Keywords:** Psoriasis, PASI, OSDI, Ocular

### I. INTRODUCTION:

Psoriasis is an immune-mediated, chronic inflammatory disease of genetic basis, which

mainly affects the skin, although it has systemic pathological effects [1,2]. Psoriasis affects 1% to 3% of the adult population with various extra cutaneous manifestations. The lesions are usually erythematous plaques formed due to excessive proliferation of the underlying epidermis. Indeed, psoriasis has been shown to be associated with several comorbidities, such as psoriatic arthritis (PsA), Crohn's disease (CD), psychological/psychiatric disorders, and ocular diseases [3]. Ophthalmic complications are numerous and generally tend to occur much later after the skin involvement. Consequences of ocular manifestations are often neglected and surveys into the quality of life implications of psoriasis mostly do not give importance to ocular symptoms [4]. Ocular manifestations are subtle and are often overlooked. If Ocular examinations could be carried out at regular intervals, patients with Psoriasis would be benefited.

The ocular disorders are often nonspecific and asymptomatic, and are usually detected late with a risk of significant ocular morbidity. The ocular features are either due to direct eye involvement with psoriatic plaques, psoriasis-related immune-mediated inflammatory processes, or complications of psoriasis treatments. [5] In particular, several ocular manifestations have been reported including uveitis, dry eye, retinal abnormalities, blepharitis, conjunctivitis, keratitis, iridocyclitis, ultraviolet (UV)-induced cataracts, retinal pathologies and birdshot chorioretinitis [5,6]. Blepharitis has been found to be the most prevalent ocular involvement in psoriasis patients [7]. Dry eye, conjunctivitis, hyperemic conjunctiva, cicatricial entropion, and ectropion due to chronic blepharitis have also been reported [8]. Bilateral cataracts unrelated to previous steroid use have also been reported [4]. Uveitis is more commonly reported in psoriatic arthritis [9]. The most common presentation is that of acute anterior uveitis [10].

Ophthalmic complications of psoriasis are numerous and affect almost all parts of eye. Since



the latency period for development of symptomatic ocular abnormalities may be longer than 5 years, ocular symptoms of the patients is generally overlooked. Studies and surveys relating to the dermatological quality of life implications of psoriasis generally do not directly address ocular symptoms. Limited data is available on the ocular findings in psoriasis patients in this part of India, so the present research work was undertaken with aim to evaluate the severity of dry eyes in patients suffering with psoriasis and also to study various other ocular manifestations of psoriasis.

## II. MATERIALS AND METHODS:

The present hospital based observational study was conducted in Department of Ophthalmology, Mahatma Gandhi Medical College & Hospital, Jaipur along with coordination of Department of Dermatology during April 2021 to June 2022 among 100 patients referred from dermatology department for evaluation of ocular finding in Psoriasis were included in the study. The ethical clearance for study was taken by the Institutional Review Board for Ethical Clearance of Mahatma Gandhi Medical College & Hospital, Jaipur. All subjects/attendants were explained about the procedure and purpose of the study. All consenting patients /attendants were asked to sign a written informed consent form (in the language best understood by them).

### Inclusion Criteria

- 1) All psoriasis diagnosed patients.
- 2) Age between 18 to 60 years.

### Exclusion Criteria:

- 1) History of previous Ocular Surface Disease.
- 2) Pterygium.
- 3) Contact lens wearers.
- 4) Pregnant and lactating women.
- 5) Previous Ocular Surgery.
- 6) Diagnosed cases of other systemic diseases like diabetes, Hypertension.
- 7) Patients using any other oral medication which may lead to dry eye.
- 8) Patient not willing to participate in study.

### Clinical assessment

All subjects included in the study, after considering the inclusion and exclusion criteria, underwent a complete ophthalmic examination including the following:

- Visual Acuity – vision was recorded with the help of snellen visual acuity chart.

- Slit lamp examination- The examination of the anterior segment including lids, conjunctiva, cornea anterior chamber.
- Intraocular Pressure measurement – applanation tonometry was done for the measurement of intraocular pressure
- Fundus Examination – Each patient was subjected to dilated fundus examination with the help of 90D lens.
- For the study Of Dry Eyes following test were conducted:
  - a. OSDI (Ocular Surface Disease Index)
  - b. Tear break up time
  - c. Schimers Test
  - d. Impression Cytology

## III. METHODOLOGY:

Of all included subjects in study age, gender, address, occupation, duration of disease, type of psoriasis, area of skin involvement, past and current treatment, ocular symptoms were noted. Schirmer's-1, Tear break up time and intraocular pressure were measured. PASI score was calculated for every patient.

PASI Score – Psoriasis Area and Severity Index is a scale for quantifying the severity of psoriasis based on the area involved and appearance of plaque.

The body is divided into 4 sections:

1. Head
2. Arms
3. Trunk
4. Legs

For every section, the percentage area of skin involved is estimated and converted into a grade 0 to 6. Three clinical signs estimate the severity within each area: erythema, induration and desquamation. They are scored on a scale of 0 to 4. The above 3 severity parameters are summed up for each section of skin, multiplied by area score and by weight of section of the body (0.1 for head, 0.2 for arms, 0.3 for body and 0.4 for legs). Every section is scored by itself, and four scores are summed up to calculate the final PASI, which can be a number ranging from 0-72.

Data was analysed using appropriate statistical techniques.

## IV. STATISTICAL ANALYSIS:

Data so collected was tabulated in an excel sheet, under the guidance of statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA). For each assessment point, data were statistically analyzed using one way ANOVA. Difference



between two groups was determined using chi square test and the level of significance was set at  $p < 0.05$ .

**V. RESULTS:**

Of the 100 subjects included in study, majority of subjects were male (61%) and

remaining 39 subjects were females. Majority of the subjects were in age range 41-50 years (n=41, 41%), followed by 29 subjects between 31-40 years of age, 17 subjects were 18-30 years old, 11 patients were within 51-60 years of age and only 2 subjects were >60 years of age (table 1).

Table 1: Gender distribution among the study subjects

Gender	N	%
Male	61	61
Female	39	39
<b>Age Group (in years)</b>		
18-30	17	17
31-40	29	29
41-50	41	41
51-60	11	11
>60	2	2
Total	100	100

Maximum subjects had complained of psoriasis for <5 years (62%), 27 had it for 6-10 years and only 11 patients complained of

psoriasis >10 years of duration. 46 subjects had PASI score between 6-10, 43 had it >10 and only 11 patient's score was <5. (Table 2)

Table 2: Psoriasis characteristics among the study subjects

Psoriasis	N	%
Plaque	75	75
Guttate	8	8
Erythrodermic	6	6
Pustular	6	6
Psoriatic Arthritis	5	5
<b>Duration (in years)</b>		
<5	62	62
6-10	27	27
>10	11	11
<b>PASI (Psoriasis Area and Severity Index)</b>		
<5	11	11
6-10	46	46
>10	43	43
Total	100	100

Ocular manifestations were present in 73 patients of Psoriasis and absent in 27 subjects. In 73 subjects having ocular manifestations, 32 had Cataract, 27 had complain of Dry Eyes, 10 had

Blepharitis, 3 patients complained of Chronic conjunctivitis and only one subject had Uveitis. (Table 3)

Table 3: Distribution of patients with ocular manifestations

Ocular Manifestations	N	%
Cataract	32	32
Dry Eyes	27	27
Blepharitis	10	10
Chronic conjunctivitis	3	3
Uveitis	1	1
None	27	27



There was a statistically significant positive correlation between duration of psoriasis and presence of ocular manifestations (p=0.044). There was a positive statistically

significant correlation between ocular manifestations with PASI score (p=0.018). (Table 4)

Table 4: Association of ocular manifestations with duration of psoriasis (in years) and PASI

Duration (in years)	N	Ocular Manifestation		p value
		Present	%	
<5	62	43	69.35	0.044*
6-10	27	21	74.07	
>10	11	9	81.82	
<b>PASI</b>				
<5	11	4	36.36	0.018*
6-10	46	32	69.57	
>10	43	37	86.05	

\*: statistically significant

There was an inverse statistically significant correlation present in severity of psoriasis and mean Schirmer values (p=0.007).

There was a positive statistically significant correlation present in severity of psoriasis and mean OSDI (p=0.009). (Table 5)

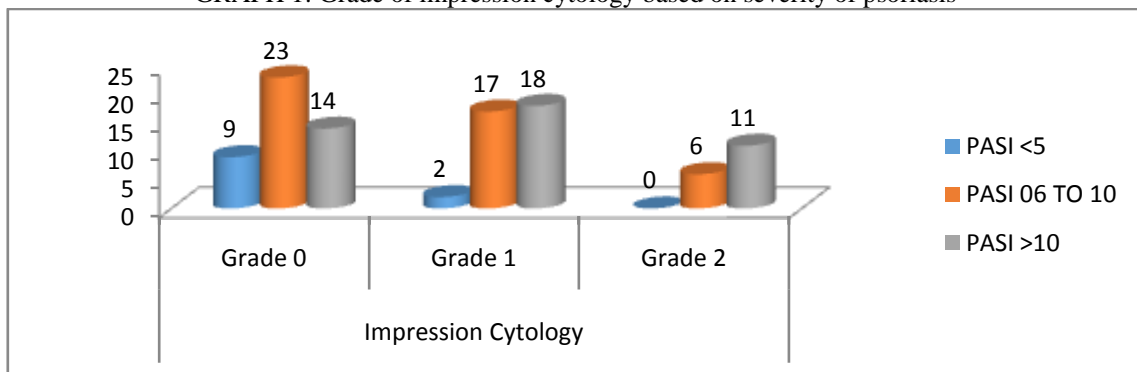
Table 5: Association between mean Schirmer, OSDI andTBUT values based on severity of psoriasis

PASI	Schirmer Value		p value
	Mean	SD	
<5	17.32	6.43	0.007*
6-10	12.09	6.27	
>10	10.13	3.68	
	OSDI		p value
	Mean	SD	
<5	12.78	3.97	0.009*
6-10	14.71	4.06	
>10	17.09	3.81	
	TBUT Value		p value
	Mean	SD	
<5	10.86	1.17	0.008*
6-10	9.31	1.54	
>10	7.62	1.12	

\*: statistically significant

There was a statistically significant difference present in grade of impression cytology and severity of psoriasis (p=0.002). (Graph 1)

GRAPH 1: Grade of impression cytology based on severity of psoriasis





## VI. DISCUSSION:

Ocular involvement in psoriasis is not well described in the literature. Ocular problems of psoriasis are many and occur later, after the skin involvement; additionally, they can upset virtually any part of the eye. These ocular disorders involve the cornea, but may also include the conjunctiva, uvea, sclera, retina, and surrounding structures. Impact of ocular disorders is often neglected and surveys into the quality-of-life implications of psoriasis, mostly do not give importance to ocular symptoms. Ocular complications are subtle and are every so often unnoticed. Frequent ocular examinations could benefit the psoriatic patients.

In present study, of the 100 subjects included in study majority of subjects were male (61%) and remaining 39 subjects were females. Male to female ratio was 1.56:1. The findings of present study were almost similar to results of **Shah RD et al., (2021)** [11] and **Singh A et al., (2022)** [12]. In study done by **Kharolia A et al., (2022)** [13] there were 14 females (20.6%) and 54 males (79.4%). Male to female ratio was 3.85:1.

In the present study, maximum subjects were in age range 41-50 years (n=41, 41%), followed by 29 subjects between 31-40 years of age, 17 subjects were 18-30 years old, 11 patients were within 51-60 years of age and only 2 subjects were >60 years of age. Minimum age of the subject included in study was 22 years and maximum age of included patient was 65 years. These findings were in accordance to results of **Maitray A et al., (2016)** [14], **Shah RD et al., (2021)** [11] and **Chowdhury B et al., (2017)** [15].

In this study, 75% subjects had Plaque type of psoriasis, 8% had Guttate, 6% each had Erythrodermic and Pustular, and 5% patients had Psoriatic Arthritis. These results were in accordance to findings of **Singh A et al., (2022)** [12]. In a study done by **Kharolia A et al., (2022)** [13] plaque psoriasis was the most common presentation (56, 82.4%) followed by 5 (7.4%) patients with Erythrodermic, Pustular and Psoriatic arthritis in 2 (2.9%) patients each and Guttate had 3 (4.4%) patients. According to the findings of **Maitray A et al., (2016)** [14] 65 (86.67%) subjects have Plaque type of psoriasis, 2 (2.67%) had Guttate, Erythrodermic was in 2 (2.67%) patients, 2 (2.67%) subjects had Pustular and Psoriatic Arthritis in 4 (5.33%) patients. In study done by **Shah RD et al., (2021)** [11] majority of patients had psoriasis vulgaris (87%). Other clinical types of psoriasis found in the study group were erythrodermic (6%), pustular (4%), and guttate type (3%).

In present study, 46% subjects had PASI score between 6-10, 43% had it >10 and only 11% patient's score was <5. These results were almost similar to findings of **Shah RD et al., (2021)** [11]. According to study done by **Maitray A et al., (2016)** [14] 8 (10.67%) subjects had PASI score <5, 36 (48%) patients had between 5-10, 31 (41.33%) subjects had >10 score. **Singh A et al., (2022)** [12] found that 40 patients (31.7%) had a PASI score less than 10, 75 patients (59.5%) had a PASI score in the range of 10-20 and remaining 11 patients (8.7%) had a PASI score more than 20.

Ocular manifestations were present in 73 patients of Psoriasis and absent in 27 subjects. Prevalence of ocular manifestations is 73% in present study. Of the 73 patients having ocular manifestations, 32 had Cataract, 27 had complain of Dry Eyes, 10 had Blepharitis, 3 patients complained of Chronic conjunctivitis and only one subject had Uveitis.

**Singh A et al., (2022)** [12] found that overall, ocular manifestations were seen in 76 patients (60.3%) out of 126 patients in the study population. They found an overlap of various ocular manifestations. In study done by **Maitray A et al., (2016)** [14] out of the 75 psoriasis patients included in the study, 53 (70.67%) had ocular manifestations. Ocular manifestations such as cataract/pseudophakia (n=29, 39%), Dryness (n=28, 37%), blepharitis (n=18, 24%), conjunctivitis (n=6, 8%) and uveitis (n=2, 2.6%) were observed in the study group, with the overlap of manifestations. In study done by **Chowdhury B et al., (2017)** [15] prevalence of ocular findings and complications were approximately 44%. Most of the patients were asymptomatic. Multiple ocular involvement was present in 14.3% patients and 48.6% of the ocular findings were bilateral. Various ocular diseases encountered were cataract (28.5%), conjunctivitis (11.4%), dry eye (8.6%), meibomitis (7.1%), trichiasis (1.4%) and uveitis (1.4%). According to study done by **Shah RD et al., (2021)** [11] one or more ocular signs were seen among 61% of cases in psoriasis group. Ocular signs seen in the study group were blepharitis (27%), conjunctival hyperaemia (47%), dry eye (36%), corneal opacities (9%), punctate epithelial erosion (5%), uveitis (3%), and cataract (29%).

There was a statistically significant positive correlation between duration of psoriasis and presence of ocular manifestations (p=0.044). This shows that with increase in duration of psoriasis, chances of ocular involvement are more. In study done by **Shah RD et al., (2021)** [11], there was no statistically significant difference present in subjects according to duration



of psoriasis and ocular manifestations ( $p > 0.05$ ). According to study done by **Maitray A et al., (2016)** [14] of the 50 subjects with psoriasis  $< 5$  years, 36 (72%) had ocular manifestation, 17 patients with psoriasis having 6-10 years, 11 (65%) had ocular manifestations and among 8 patients with psoriasis  $> 10$  years, 6 (75%) had ocular manifestations. In study done by **Kharolia A et al., (2022)** [13] the correlation between duration of psoriasis with ocular symptoms was not statistically significant.

There was a positive statistically significant correlation between ocular manifestations with PASI score ( $p = 0.018$ ). This suggests that with increase in PASI score there is increased possibility of ocular manifestations in patients of psoriasis. **Singh A et al., (2022)** [12] found that ocular manifestations were more commonly seen in patients with a PASI score  $> 10$  when compared with patients with PASI  $< 10$ , and this difference was statistically significant. In study done by **Maitray A et al., (2016)** [14] about 50% with less than 5 PASI score, 72% with 5-10 PASI score and 74% patients with more than 10 PASI score developed ocular manifestations. Ocular manifestations were more common in patients with PASI score  $> 10$  when compared to patients with PASI  $\leq 10$  and this difference was statistically significant ( $p$  value is 0.009) by Fischer exact test). In study done by **Kharolia A et al., (2022)** [13] the correlation between PASI score with ocular symptoms was not statistically significant.

There was an inverse statistically significant correlation present in severity of psoriasis and mean Schirmer values ( $p = 0.007$ ). This shows that with increase in severity of psoriasis, the mean Schirmer values decrease. There was a positive statistically significant correlation present in severity of psoriasis and mean OSDI ( $p = 0.009$ ). This suggests that with increase in severity of psoriasis, OSDI value will increase. Similar results were found by **Maitray A et al., (2016)** [14] and **Chowdhury B et al., (2017)** [15].

### VII. LIMITATIONS:

The sample size was small and all subjects were included from one centre in the current study, which had an impact on the findings because it has been observed that the ocular manifestation of patients with psoriasis differs depending on region. Therefore, additional multicenter studies involving populations of various ethnicities are needed to validate the findings of this research.

### VIII. CONCLUSION:

In the current study, 73% of the Indian population in this region of the country had ocular psoriasis symptoms. The duration of psoriasis and PASI score had a statistically significant positive correlation with the existence of ocular symptoms. The severity of psoriasis showed an inverse statistically significant connection with mean Schirmer values and mean TBUT values. Psoriasis severity and mean OSDI showed a statistically significant positive connection. The severity of psoriasis and the grade of impression cytology differed statistically significantly. There are many ocular problems associated with psoriasis, and they can impact various eye structures. Without a focused complete ocular evaluation, they may continue to be mild and so clinically overlooked. As a result, psoriasis sufferers should regularly undergo ophthalmic evaluation for the purpose of early diagnosis and management of eye illnesses. The requirement for ophthalmological evaluation at the time of diagnosis and future follow ups should be made clear to the dermatological and medical colleagues who are typically the first to interact with psoriasis patients.

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