The Prevalence of Ocular Manifestations in the Various Types of Common Skin Disorders at Tertiary Hospital in Ahmedabad, India

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Abstract

Aim

The article aims to study the prevalence and ocular manifestations of the various types of common skin disorders at a tertiary hospital in Ahmedabad, India.

Materials and methods

Five hundred patients were studied in the ophthalmology department from September 2017 to September 2019.

Results

Out of the 500 patients that were included in our study, 312 were males, and 188 were females. In our study, lid involvement was seen most commonly in patients with herpes zoster ophthalmicus (HZO). Plexiform neurofibroma was seen in eight (14.6%) patients with neurofibromatosis (NF). Cicatricial epibulbar keratopathy was seen in patients with leprosy. Conjunctivitis was seen commonly in HZO patients. Papillary conjunctivitis was seen in half of the atopic dermatitis cases. Stevens-Johnson syndrome (SJS) was associated with pseudomembranous conjunctivitis. Conunctival scarring was seen only in patients with Sjogren’s syndrome. The most commonly involved patients in HZO. Decreased corneal sensation was seen in leprosy and HZO. Lisch nodules were seen in NF cases. Anterior uveitis was found in seven (6.3%) patients with HZO. Glaucoma was seen most commonly in patients with Sturge Weber syndrome (SWS), followed by leprosy. Facial nerve palsy was seen in patients with leprosy. Epidermolysis was seen in patients with leprosy and SWS.

Conclusion

We conclude that ocular involvement in skin disease is a common feature and could be a major component of the development of various systemic skin disorders.

Keywords: lagophthalmos, skin diseases, psoriasis, leprosy, neurofibromatosis, acne, hiv, hzo, prevalence, ocular manifestations
Psoriasis is an uncommon disease that often involves the eye. It affects males and females equally [6]. Skin can present with persistent scaly plaques, flaking, itch, and pain. The ocular manifestations include conjunctivitis, chronic blepharitis, keratitis, trichiasis, syblepharon, anterior uveitis, and retinal vasculitis. Uveitis in psoriasis patients is chronic; a bilateral condition found in older age groups, while human leukocyte antigen B27 (HLA B27) anterior uveitis is unilateral with prior posterior ocular involvement. Prolonged courses of systemic corticosteroids for psoriasis management may cause posterior subcapsular cataracts.

This article aims to study the prevalence of ocular manifestations in different types of dermatology diseases at a general hospital in Ahmedabad, India.

Materials And Methods

Our study is an observational retrospective study carried out on patients with dermatological diseases who were presented to the ophthalmology department in a tertiary hospital from September 2017 to September 2019. Patients were treated with comprehensive combined care with the dermatology department. We obtained approval from the Institutional Review Board of AMC MET Medical College, affiliated with Gujarat University, and written consent from the 500 patients. Research on patients suffering from any mental, neurological, or debilitating illness, which hampers examination, were excluded from the study. Age, sex, and type of skin disease were noted. Patients having skin disease were examined clinically to rule out any associated ocular condition. After consulting with the dermatology department, all dermatological findings and treatments were noted. The past history of the patient was recorded, including any medications for skin disease and the duration of a particular disease. Best-corrected visual acuity of the patient was taken by Snellen’s chart. Intracocular pressure of both eyes was measured in all indicated patients. In any case of corneal epithelial defects or corneal erosions, corneal staining was done by using 2% fluorescein strips. In all cases of dry eyes, we have done Schirmer’s test for five minutes using Whatman® number 41 filter paper.

Those patients who are suspected of having glaucoma were sent for investigations like perimetry and optical coherence tomography. If needed, radiological investigations like X-ray orbit, magnetic resonance imaging, and computed tomography scan were done. The number of patients with a particular disease having specific ophthalmic manifestations was calculated and analyzed.

Results

In this retrospective study, 500 patients having dermatological diseases were included, of which 312 (62.4%) were males and 188 (37.6%) were females. Ophthalmological findings were correlated with particular dermatological diseases. One hundred and eleven (22.2%) patients had HZO, 60 (12%) patients had HSV, 57 (11.4%) patients had acne, 55 (11%) patients had NF, 49 (9.8%) patients had leprosy and 35 (7%) patients had pustulosis (Table 1).

In our study, the most common lid manifestation was vesicles seen in 91 (81.9%) patients, and scarring was seen in 10 (9.0%) HZO patients. In acne patients, blepharitis, meibomian gland dysfunction (MGD), and dry eye were seen in 22 (38.5%), four (7%), and five (8.7%) patients, respectively. Fluorescent NF was seen in eight (14.5%) patients. Ninety-two (18.4%) patients had conjunctivitis. These 60% patients with Steven Johnson’s syndrome (SJS) had pseudo membrane. Two (6.6%) patients with Sjogren’s syndrome had conjunctival scarring (Table 2).

### TABLE 1: Sex distribution of dermatology diseases

| Age distribution in years | Acne | Alopexic dermatitis | Stevens-Johnson syndrome | Pemphigus | Acutegesture | Bullous pemphigoid | Syphilis | Syphilis | Human immunodeficiency virus (HIV) | Neurofibromatosis (NF) | Sturge-Weber syndrome (SWS) | Ichthyosis | Leprosy | Systemic lupus erythematosus (SLE) | Hyper IgE |
|---------------------------|------|---------------------|--------------------------|---------|-------------|-------------------|--------|--------|---------------------------|---------------------|--------------------------|----------|--------|-------------------------------|---------|
| 1-10                      | 0    | 0                   | 0                        | 0       | 0           | 0                  | 0      | 0      | 0                          | 0                   | 0                        | 0         | 0      | 0                             | 0       |
| 11-20                     | 6    | 0                   | 1                        | 6       | 0           | 0                  | 2      | 0      | 0                          | 0                   | 0                        | 0         | 0      | 0                             | 0       |
| 21-30                     | 42   | 1                   | 0                        | 3       | 0           | 0                  | 13     | 18     | 0                          | 0                   | 0                        | 0         | 0      | 0                             | 0       |
| 31-40                     | 9    | 0                   | 0                        | 0       | 0           | 0                  | 13     | 14     | 17                         | 1                   | 0                        | 0         | 0      | 0                             | 0       |
| 41-50                     | 0    | 0                   | 0                        | 0       | 2           | 0                  | 4      | 4      | 0                          | 0                   | 0                        | 0         | 0      | 0                             | 0       |
| 51-60                     | 0    | 0                   | 0                        | 0       | 0           | 1                  | 52     | 0      | 0                          | 0                   | 0                        | 0         | 0      | 0                             | 0       |
| 61-70                     | 0    | 0                   | 0                        | 0       | 0           | 0                  | 0      | 0      | 0                          | 0                   | 0                        | 0         | 0      | 0                             | 0       |
| Total                     | 57   | 11                  | 12                       | 3       | 111          | 33                 | 34     | 55     | 3                          | 3                   | 24                       | 49        | 4      | 1                             |         |

### TABLE 2: Age group distribution of dermatology diseases

In our study, the most common lid manifestations were vesicles seen in 9 (81.9%) patients, and scarring was seen in 10 (9.0%) HZO patients. In acne patients, blepharitis, meibomian gland dysfunction (MGD), and dry eye were seen in 22 (38.5%), four (7%), and five (8.7%) patients, respectively. Fluorescent NF was seen in eight (14.5%) patients. Ninety-two (18.4%) patients had conjunctivitis. These 60% patients with Steven-Johnson’s syndrome (SJS) had pseudo membrane. Two (6.6%) patients with Sjogren’s syndrome had conjunctival scarring (Table 3).
**TABLE 3: Eyelid and conjunctival findings in dermatology diseases**

MGD - meibomian gland dysfunction; NF - neurofibromatosis

In our study, keratitis was seen in 29 (26.1%) HZO patients, while decreased corneal sensation was seen in 14 (28.5%) leprosy patients. Anterior uveitis was seen in seven (6.3%) patients with HZO, while lisch nodules were seen in 41 (74.5%) patients with NF (Table 4).
### Table 4: Cornea and uvea findings in dermatology diseases

| Keratitis findings | Dermatology diseases | Decreased corneal sensation | Epithelial keratitis, endotheliitis | Endotheliitis | Epithelial keratitis | Epithelial keratitis, Hutchinson’s sign | KP’s | Megalocornea | Opacification | Stromal keratitis | Normal | Total |
|--------------------|----------------------|-----------------------------|----------------------------------|--------------|---------------------|----------------------------------------|------|-------------|--------------|-----------------|---------|-------|
| Acne               | 0                    | 0                            | 0                                | 0            | 0                   | 0                                       | 0    | 0           | 0            | 0               | 0       | 111   |
| Atopic dermatitis  | 0                    | 0                            | 0                                | 0            | 0                   | 0                                       | 0    | 0           | 0            | 0               | 0       | 111   |
| Stevens-Johnson syndrome (SJS) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Pemphigus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Pemphigoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Sjogren’s syndrome (SS) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Herpes zoster ophthalmicus (HZO) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Syphilis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Human immunodeficiency virus (HIV) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Neurofibromatosis (NF) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Tuberous sclerosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Sturge-Weber syndrome (SWS) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Ichthyosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Sjogren’s syndrome | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Leprosy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Systemic lupus erythematosus (SLE) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |

In our study, lens manifestations were seen as cataract in 136 (27.2%) patients. Out of these, 86 (77.4%), 32 (35.3%), and 15 (27.2%) were in patients with HZO, HSV, and leprosy, respectively. Posterior subcapsular cataract was present in eight (16.3%) patients with leprosy. Anterior retinal manifestation, was seen in one patient with tuberous sclerosis (7%). Fifteen (3%) patients had glaucoma, out of which 11 (22.4%) were seen in patients with leprosy. Ocular manifestation, like seventh cranial nerve palsy, was seen in 14 (28.5%) patients with leprosy, and episcleritis was seen in 10 (20.4%) patients with leprosy (Table 3).
A total of 57 (11.4%) patients had acne; 32 (56.1%) patients were males, and 25 (43.8%) patients were females giving a male to female ratio of 2:1. A study conducted by Kaul et al. in North India estimated the incidence of HSV1 as 33.3% patients were females giving a male to female ratio of 2:1. A similar finding was seen in the study by Dubey et al. in South India, where the male to female ratio was 1.17:1. Of 111 patients with HZO, 60 (54.05%) patients were males, and 51 (45.9%) were females, with a male to female ratio of 1.1. In our study, anterior uveitis was most common in elder age groups: 52 (46.8%) patients from the 51-60 age group and 55 (49.5%) from the 61-70 age group. Sehgal et al. found a high incidence in the fourth and fifth decades (53.3%), and 15 (27.2%) had HZO, HSV, and leprosy, respectively, which was due to patients from older age group.

In this retrospective study of patients having dermatological diseases total of 500 patients were included, of which 312 (62.4%) were males, and 188 (37.6%) were females. Ophthalmological findings were correlated with particular dermatological diseases. One hundred and eleven (22.2%) patients had HZO; 60 (12.2%) patients had HSV; 57 (11.4%) patients had acne, 55 (11%) patients had NF, 49 (9.8%) patients had leprosy, and 33 (6.6%) patients had neurofibromatosis.

### Table 5: Lens, retina, optic nerve head and other findings in dermatology diseases

| Lens findings | Dermatology diseases |
|---------------|----------------------|
|               | Acne | Atopic dermatitis | Steven Johnson syndrome (SJS) | Pemphigoid | Sjogren's syndrome | Herpes zoster ophthalmicus (HZO) | Syphilis | HIV | Neutrophilic keratitis (NF) | Tubercular keratitis | Sturge-Weber syndrome (SWS) | Idiophyly | Leptony | Systemic lupus erythematosus (SLE) | Hype | IgG | Plaque |
|---------------|------|------------------|-----------------------------|-----------|------------------|-------------------------|---------|---|----------------|----------------------|----------------------|---------|--------|---------------------|---|------|------------------|
| Anterior subcapsular cataract | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cortical cataract | 0 | 0 | 0 | 2 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Nuclear cataract | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 |
| Nuclear cataract, cortical cataract | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Posterior subcapsular cataract | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pseudophakia | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Normal | 57 | 10 | 05 | 12 | 1 | 0 | 33 | 34 | 55 | 3 | 3 | 24 | 22 | 4 | 1 | 35 |
| Total | 57 | 11 | 05 | 12 | 3 | 111 | 33 | 34 | 55 | 3 | 3 | 24 | 49 | 4 | 1 | 35 |
| Retinal findings | | | | | | | | | | | | | | |
| Astrocystoma | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Absent | 57 | 11 | 5 | 12 | 3 | 111 | 33 | 34 | 55 | 2 | 3 | 24 | 49 | 4 | 1 | 35 |
| Total | 57 | 11 | 5 | 12 | 3 | 111 | 33 | 34 | 55 | 3 | 3 | 24 | 49 | 4 | 1 | 35 |
| Optic nerve head findings | | | | | | | | | | | | | | |
| Glaucomatous | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 |
| Normal | 57 | 10 | 5 | 12 | 3 | 111 | 33 | 34 | 55 | 3 | 0 | 24 | 38 | 4 | 1 | 35 |
| Total | 57 | 11 | 05 | 12 | 3 | 111 | 33 | 34 | 55 | 3 | 3 | 24 | 49 | 4 | 1 | 35 |
| Other ocular findings | | | | | | | | | | | | | | |
| Severe cranial nerve palsy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Epileptiles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 10 | 0 | 0 |
| Normal | 57 | 11 | 5 | 12 | 3 | 111 | 33 | 34 | 55 | 3 | 0 | 24 | 25 | 4 | 1 | 35 |
| Total | 57 | 11 | 5 | 12 | 3 | 111 | 33 | 34 | 55 | 3 | 3 | 24 | 49 | 4 | 1 | 35 |

### Discussion

In this retrospective study of patients having dermatological diseases total of 500 patients were included, of which 312 (62.4%) were males, and 188 (37.6%) were females. Ophthalmological findings were correlated with particular dermatological diseases. One hundred and eleven (22.2%) patients had HZO; 60 (12.2%) patients had HSV; 57 (11.4%) patients had acne, 55 (11%) patients had NF, 49 (9.8%) patients had leprosy, and 33 (6.6%) patients had neurofibromatosis.

In our study, lens manifestations were seen as cataract in 136 (27.2%) patients. Out of these, 86 (77.4%), 52 (53.3%), and 15 (27.2%) had HZO, HSV, and leprosy, respectively, which was due to patients from older age group.

Of 111 patients with HZO, 60 (54.05%) patients were males, and 51 (45.9%) were females, with a male to female ratio of 1.17:1. A similar finding was seen in the study by Dubey et al. in South India, where the male to female ratio was 1:84:1 [7]. Sehgal et al. also noted that males are affected more than females [7-9]. In our study, the commonest age group of presentation among the patients with HZO was 51-60 years. HZO was most commonly seen in elder age groups: 52 (46.8%) patients from the 51-60 age group and 55 (49.5%) from the 61-70 age group. Sehgal et al. found a high incidence in the fourth and fifth decades [8]. In our study, the most common lid manifestations were vesicles seen in 91 (81.9%) patients and scarring seen in 10 (9.0%) patients with HZO, similarly to the study conducted by Nigran et al. [9]. In our study, anterior uveitis was seen in seven (6.3%) patients with HZO. Herpetic anterior uveitis was the most common cause of viral anterior uveitis accounting for 5-10% of all uveitis cases in the western world and 0.8-3.5% of all infectious uveitis in India [10].

A total of the 60 patients had the herpes simplex virus; 40 (66.6%) patients were males, and 20 (33.3%) patients were females giving a male to female ratio of 2:1. A study conducted by Kaul et al. in North India estimated the incidence of HSV1 as 5.3% [11], while in our study, the incidence of HSV1 was 12.2%. In our study, epithelial keratitis was seen in 10 (16.6%) patients with HSV, which corresponds with the Fukuda et al. study reporting the highest number of copies of HSV-2 DNA in herpetic epithelial keratitis, followed by active stromal keratitis and persistent epithelial defect. Their detection rate was higher at 98.1% for epithelial keratitis and 99.1% for stromal keratitis [12].

A total of 57 (11.4%) patients had acne; 32 (56.1%) patients were males, and 25 (43.8%) patients were females giving a male to female ratio of 1:28:1. Ocular rosacea affects both males and females equally [13].

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Ocular rosacea was seen in more than half of the patients with dermatology disease, indicating a high prevalence rate of ocular manifestation[14]. Rosacea most commonly affects middle-aged adults[15]. The mean age in our study was found to be 25 years. Lid inflammation and oil gland dysfunction are common findings in patients with ocular rosacea leading to dry eye[16].

A total of the 55 patients had neurofibromatosis; 37 (67.2%) were males, and 18 (32.8%) were females. This corresponds with the study conducted by Odleide et al., in which there was a definite male predominance, affecting 60 males and 36 females with a total of 96 patients[17]. The common age group in our study was 18-25 years; 48 (88.6%) patients presented to us in between 20-40 years. In our study, eight (14.5%) of the 55 patients with neurofibromatosis had plexiform neurofibroma, while lisch nodules were the commonest manifestation present in 41 (74.5%) patients[18].

Of the 49 patients with leprosy, 31 (63.2%) were males, and 18 (36.8%) were females. The male to female ratio is 1:2.1 [19]. There is no significant difference in the age distribution of patients with Hansen’s disease as compared to that of patients with ocular involvement. The majority of the patient with ocular involvement was seen in the age group of 21-40 years [20]. In the study conducted by Bhaskara, out of 250 cases, 140 (56.2%) cases showed ocular leprosy[21]. This variation can be racial too, Asians being more susceptible. In our study, 49 (88.6%) patients with leprosy had ocular manifestations. Leporolophomas, decreased corneal sensation, epithelial endophthalmitis, cataract, glaucomatous optic disc changes, seventh cranial nerve palsy, and epilepticis was seen in 10 (20.4%), eight (16.3%), six (12.2%), 27 (55.1%), 11 (22.4%), 14 (28.8%), 10 (20.4%) patients, respectively. In a study by Ghosebshah et al., the major sight-threatening lesions included cataract (65%), leporolophomas (12%), keratitis (13%), and glaucoma (9%), corresponding with our study findings[22].

A total of the 55 patients with psoriasis, 35 (64%) were males, and 10 (18.2%) were females giving a male to female ratio of 2.5:1. There is a slight male predominance, probably due to better access of male patients to healthcare services in our country. This finding is similar to the study reported earlier [23].

Among the 55 patients with psoriasis, in our study, we found conjunctivia to be the most common manifestation seen in 12 (21.8%) patients. Seven (20%) patients had chronic anterior uveitis. Cataract-Catarract et al. found that Mephalanophytix was the most common manifestation of psoriasis[24].

Atopic dermatitis was seen in 10 (90%) patients in the 1-10 age group. Ichthyosis was seen in 22 (91.6%) in the 1-10 age group. Three (46%) patients with SJS had pread membrane. Two (66.6%) patients of Sjogren’s syndrome had conjunctival xerosis. Cicatricial ectropion was found in half of the patients with psoriasis[25].

Conclusions
In our study, the most common skin diseases associated with ophthalmic manifestations were herpes zoster ophthalmicus, herpes simplex virus, ocular rosacea, neurofibromatosis, leprosy, and psoriasis. Viral skin diseases are most commonly associated with ocular manifestations. Viral skin diseases are common and potentially devastating diseases that demonstrate significant ophthalmic morbidity if not adequately diagnosed and treated.

The majority of the ocular manifestations are seen in the anterior segment of the eye. Among phakomatosis, neurofibromatosis is associated with lisch nodules and plexiform neurofibroma. Herpesvirus simplex type examination for the presence of lisch nodule is a simple, non-invasive, inexpensive method of diagnosing neurofibromatosis accurately. As the majority of dermatological diseases are associated with ocular features, complete ocular evaluation is necessary for every patient with dermatological disease.

Additional Information
Disclosures
Human subjects: Consent was obtained or waived by all participants in this study. Animal subjects: All authors have confirmed that this study did not involve animal subjects or tissue. Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors disclose the following: Payment/services: All authors have declared that no financial support was received from any organization for the submitted work. Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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