Acta Med. Okayama, 2003
Vol. 57, No. 6, pp. 299-303

Acta Medica Okayama
http://www.lib.okayama-u.ac.jp/www/acta/

Original Article

Ocular Anterior Segment Pathologies and Tear Film Changes in Patients with Psoriasis Vulgaris

Ibrahim Erbagci[a]*, Zülal Erbagci[b], Kıvanç Gungor[a], and Necdet Bekir[a]

[a]Department of Opthalmology, and [b]Department of Dermatology, Gaziantep University Medical Faculty, Gaziantep, Turkey

Ocular manifestations in patients with psoriasis vulgaris have been investigated in only a small number of studies. Our purpose was to identify tear film function and ocular pathologies associated with psoriasis vulgaris in patients who had received neither oral retinoids nor phototherapy. We examined 62 eyes of 31 patients with psoriasis and 60 eyes of 30 age-and-sex matched healthy volunteers. In addition to complete ocular and dermatological examination, tear film function (*i.e.*, tear secretion and tear film stability) were assessed by the Schirmer-I test, as well as by tear film break-up time. None of the controls had any ocular abnormalities, whereas 67.74% of patients with psoriasis had various anterior segment pathologies ($P < 0.00009$). The most prevalent finding was chronic blepharoconjunctivitis (64.5%), as the only pathology (n = 9) or in association with other findings, including nonspecific corneal opacities (n = 4), cataract (n = 3), both corneal opacities and cataract (n = 2), and corneal pigment dispersion (n = 2). The Schirmer-I test results revealed comparable mean values in the patient group (9.8 ± 4.2 mm) and in the controls (11.2 ± 3.7 mm; $P = 0.078$). However, mean tear film break-up time was significantly shorter in the patients (7.2 ± 2.5 sec) than in the healthy persons (11.7 ± 3.1 sec; $P = 0.001$). In agreement with some previous reports, our findings clearly demonstrated that early ocular involvement occurs in patients with psoriasis vulgaris, irrespective of the history of previous therapeutic modalities (*e.g.*, retinoid therapy and phototherapy). Thus, the present findings are suggestive of the contributory role of primary etiologic factors of psoriasis in the pathogenesis of ocular changes in patients with psoriasis vulgaris.

Key words: psoriasis vulgaris, ocular anterior segment pathologies, tear film changes

Psoriasis is a common chronic inflammatory skin disease of unknown etiology expressing wide variation in terms of distribution and severity. The disease is characterized by erythematous plaques with a scaly surface as a result of the excessive proliferation of the underlying epidermis [1, 2]. Although its occasional association with intraocular inflammatory diseases, especially uveitis, has been reported (typically in cases of arthropathic or pustular psoriasis) [3-5], the ophthalmologic pathologies accompanying psoriasis vulgaris have been investigated in only a small number of studies [6-8]. Ocular manifestations have been suggested to occur about in 10% of cases of psoriasis [9]. These manifestations include blepharitis, conjunctivitis, keratitis, xerophtalmia, corneal abscess, cataract, orbital myositis, symblepharon, Brown's Syndrome (limitation of adduction to up-

Received July 17, 2003; accepted August 18, 2003.
*Corresponding author. Phone: +90-342-3220500; Fax: +90-342-3603928
E-mail: erbagciibrahim@hotmail.com (I. Erbagci)

gaze), birdshot chorioretinopathy, uveitis, increased flare without uveitis, and inflammatory ectropion with trichiasis or madarosis resulting from eyelid involvement [6–14].

Recently, it has been proposed that primary etiologic factors may contribute to the development of ocular lesions in patients with psoriasis, since early conjunctival surface changes, tear film alterations, and meibomian gland dysfunction have been reported in patients with mild to moderate psoriasis vulgaris [7, 8]. Furthermore, increased aqueous flare was observed in patients with psoriasis, even when the patient did not experience an attack of uveitis [2].

In this case-control study, we aimed to determine the incidence and nature of eye pathologies associated with mild to moderate psoriasis of the classic plaque type. We also examined ocular motility and tear film function in healthy controls and in patients, who had not reported having had other unequivocal ocular complaints. Finally, we investigated possible relationships between the frequency of ocular involvement and patient age, sex, duration of illness since diagnosis, and severity of the disease.

Patients and Methods

Our case population consisted of 62 eyes of 31 subjects (15 males and 16 females; age range: 15–67; mean ± SD, 39.2 ± 14.6 years) with chronic plaque-type psoriasis who had never complained of ocular symptoms. The diagnosis of psoriasis was confirmed by skin biopsy in each patient. Our exclusion criteria from the study included actual eye lid involvement, a history of past or present oral retinoid ingestion, and any kind of phototherapy (PUVA, narrow band or traditional UVB), which could have caused ocular damage. Patients with medical problems other than psoriasis, those who wore contact lenses, and those who were on any systemic or topical medication were also excluded from the study. All patients were questioned about the duration of the disease. The severity of the disease was determined by the Psoriasis Area and Severity Index (PASI), which is described elsewhere [7]. As controls, 60 eyes of 30 matched healthy volunteers (15 males and 15 females; age range: 16–66; mean ± SD, 36.5 ± 14.2 years) were examined (Table 1). Informed consent was obtained from all participants before entering the study.

A complete ophthalmologic examination, including evaluation of visual acuity, biomicroscopy, assessment of ocular motility, intraocular pressure measurement with Goldmann's applanation tonometer, fundoscopy with a Volk 90D lens and Goldmann's 3-mirror lens was performed on all subjects of the study. In addition, the tear film function of all subjects (*i.e.*, tear secretion and tear film stability) was evaluated by the Schirmer-I test, and by the break-up time of tear film (BUT). The Schirmer-I test was carried out without local anesthesia in order to assess tear secretion. For this test, standard filter papers were placed on the lateral fornices of each eye, and aqueous tear production was measured by the extent of tear uptake into a paper strip that had taken place after 5 min; these results were then recorded as the Schirmer-I value for each eye. To determine BUT, fluorescein gout was applied to the lower sac. Then, using a blue cobalt filter, the time lapsed between the last blink and the first dry spot appearance was recorded. The mean of the results of 3 repeated trials was regarded as the BUT for each eye.

The results were statistically analyzed by Mann-Whitney U-test and χ^2 test with the Yates correction. A P value of less than 0.05 was considered as significant.

Results

None of the control subjects was found to have any ocular abnormality, whereas various anterior segment pathologies were observed in 21 patients (67.74%) with psoriasis ($P = 0.00009$). The ocular symptoms in those psoriatic patients were rare discharge or mild itching, without any tearing. Twenty of those patients (64.5%)

Table 1 Demographic data of the study groups and disease profile

	Psoriasis patients (n = 31)	Controls (n = 30)	*P*
Age (years)			
Mean (± SD)	39.2 ± 14.62	36.5 ± 14.2	= 0.372*
Range	(15–67)	(16–66)	
Sex			
Female	16 (51.6%)	15 (50%)	= 0.814**
Male	15 (48.4%)	15 (50%)	
Disease duration (years)			
Mean (± SD)	9.1 ± 5.67	–	–
Range	(1–20)		
PASI score			
Mean (± SD)	11.5 ± 7.06	–	–
Range	(2–27)		

*, by Mann-Whitney U-test; **, by Yates corrected χ^2 test.

had chronic blepharoconjunctivitis associated with (n = 11) or without (n = 9) other eye diseases. Associated pathologies included nonspecific corneal opacities, especially in the epithelium (n = 4), cortical cataract (n = 3), both corneal opacities and cataract (n = 2), and pigment dispersion on the corneal endothelium, which was observed in 2 patients whose intraocular pressures were within the normal range (16/15 mmHg and 17/18 mmHg, respectively, in each patient. No visual field defect was found in the latter 2 patients with pigment dispersion by Octopus EZ500 automated visual field analyzer. Finally, 1 patient had only non-specific corneal opacities in one eye, which were neither dystrophic nor degenerative (Table 2).

No cells in the anterior chamber nor uveitis were detected by slit-lamp examination of any of the patients. In addition, no restriction of the extraocular muscles, such as limitation of adduction to an up-gaze was evident in any of the psoriasis patients.

The frequency of ocular pathology did not differ in terms of any of the following 4 disease variables: patient age (< 40 and ≥ 40 years), sex, PASI score (< 10 and ≥ 10), and disease duration (< 10 and ≥ 10 years). (Table 3) The mean age of the 5 patients who had cortical cataracts was 56.2 years (range: 50–65).

As regards tear secretion, the Schirmer-I test results showed no significant difference between patients and controls ($P = 0.078$). However, the mean BUT of the eyes of patients with psoriasis was significantly shorter than that of the controls ($P = 0.001$) (Table 4).

Table 2 Prevalence of ocular pathologies in psoriasis patients

Type of ocular pathology	No. of patients (%)
No ocular pathology	10 (32 %)
Only blepharoconjunctivitis	9 (29 %)
Blepharoconjunctivitis with non-specific corneal opacities	4 (13 %)
Blepharoconjunctivitis with cataract	3 (10 %)
Blepharoconjunctivitis with non-specific corneal opacities and cataract	2 (6.5%)
Blepharoconjunctivitis with corneal pigment dispersion	2 (6.5%)
Unilateral non-specific corneal opacities	1 (3 %)
TOTAL	31

Table 3 Distribution of patients with eye pathologies in terms of disease characteristics

Variables	Categories (n)	No. of patients involved (%)	P*
Age (years)	< 40 (n: 16)	11 (68.75%)	= 0.879
	≥ 40 (n: 15)	10 (66.6 %)	
Sex	Male (n: 15)	10 (66.6 %)	= 0.879
	Female (n: 16)	11 (68.75%)	
Disease duration (years)	< 10 (n: 17)	12 (70.58%)	= 0.419
	≥ 10 (n: 14)	9 (64.43%)	
PASI score	< 10 (n: 13)	8 (61.5 %)	= 0.287
	≥ 10 (n: 18)	13 (72.2 %)	

*, by Yates-corrected χ^2 test.

Table 4 The mean Schirmer-I and BUT values in psoriasis patients and controls

	Patients (n = 62 eyes)	Controls (n = 60 eyes)	P*
Schirmer-I test (mm/5 min)	9.8 ± 4.2	11.8 ± 3.7	= 0.078
Ranges	(0–19)	(3–18)	
Break-up time of tear film (sec)	7.2 ± 2.5	11.7 ± 3.1	= 0.001
Ranges	(0–14)	(3–19)	

*, by Mann-Whitney U-test.

Discussion

Psoriasis is a common dermatologic disorder and may be associated with certain ophthalmologic problems, of which uveitis is the most significant due to its ability to cause serious vision problems, especially in children [10, 15]. In 1976, Wagner and Luckasen [5] first described sterile conjunctivitis in 3 patients with generalized pustular psoriasis. Recently, Ajitsaria and Dale [14] reported extraocular inflammation in a case of orbital myositis. Although the etiology of psoriasis and its ocular manifestations remains unknown, activated neutrophils in the peripheral blood have been suggested as being responsible for the attacks of anterior uveitis associated with psoriatic arthritis [3]. It has also been suggested that uveitis tends to develop more frequently in patients with arthropathic or severe pustular psoriasis than among those patients with other types of psoriasis [2, 6, 9]. Using a flare-cell meter, Okamoto and Umebayasi [2] showed a significantly higher aqueous flare level in psoriatics without ocular problems than in controls, suggesting that a blood-aqueous barrier breakdown may occur as a result of subclinical inflammation in psoriatic patients, even among those without ocular symptoms. They also noted that the incidence of aqueous flare was positively correlated with both the severity of psoriasis and patient age, but not with sex, type of previous therapy, and disease duration. By slit lamp examination, uveitis was not detected in any of our patients, most probably because they all had mild to moderate plaque-type psoriasis. It should be noted that we had no opportunity to assess patients for aqueous flare due to the unavailability of a flare-cell meter in our clinic.

Although our patients with psoriasis had no overt ocular complaints, 64.5% did have chronic blepharoconjunctivitis, 22.5% had some non-specific opacities in the cornea-especially in the epithelium, and 16.12% had cortical cataracts (Table 2). It is well known that patients taking oral retinoids may develop blepharitis or blepharoconjunctivitis, and that those managed with phototherapy may show an increased incidence of corneal opacities. However, our study clearly demonstrated that patients who were not taking these drugs or UV therapy were also at risk, and they should therefore be regularly controlled for anterior segment pathologies. A relationship between psoriasis and blepharoconjunctivitis has been described recently due to an increased incidence of obstructive meibomian gland dysfunction among psoriatic patients [8]. Catsarou-Catsari and Katsambas [6] observed non-specific corneal opacities in 18 of 101 patients with psoriasis of all types. As the Koebner response (*i.e.*, the development of lesions on previously normal skin after traumatization either internally or externally) with minimal pressure and/or cellotype stripping has already been shown to be important in the development of psoriatic lesions on the skin [16], it is possible that such opacities may be due to microtraumas in the cornea (*i.e.*, the Koebner phenomenon) that were probably inadvertently caused by the patients themselves.

Cortical cataract was diagnosed in 5 of our patients, of whom 2 had additional non-specific corneal opacities. Age-related cataracts have been found to be significantly associated with dermatological abnormalities and their treatment with corticosteroids, especially after 69 years of age [17]. However, the development of a cortical cataract in 16.12% of our psoriatic patients may also have been coincidental, since the mean age of these patients was rather high (56.2), compared to that of the general population.

Pigment dispersions were seen in the endothelium of the cornea in 2 patients. We were unable to conclude that there are any possible pathogenetic relationships between psoriasis and pigment disorders of the eye, due to the limited number of patients enrolled in our study. However, our findings suggest that psoriatic patients should be screened for the potential risk of pigment dispersion glaucoma.

We used the same methods and criteria as those used by Gudmundsen and O'Donnell [18], whose study of dry eye in patients with rosacea also revealed a rather high incidence of dry eye (18.75%) in their control group of psoriasis patients. We found no significantly different Schirmer-I values between our study groups, but significantly shorter BUTs were observed in patients with psoriasis; these findings thus confirmed the results of 2 recent studies [7, 8]. The BUT is a more useful value for assessing the stability of precorneal tear film than are the results of Schirmer tests. Abnormal BUT values, which have been suggested to be related to a mucin-lipid deficiency in tear film or meibomian dysfunction [8], could account for the high frequency of blepharoconjunctivitis in psoriasis patients. By using impression cytology, early conjunctival cell alterations and squamous metaplasia have also been demonstrated, possibly as a result of chronic mechanical irritation, in patients with mild to moderate psoriasis [7].

In conclusion, our findings suggest that early ocular

involvement may occur in patients with mild to moderate psoriasis vulgaris, irrespective of previous therapeutic modalities such as the use of retinoids and phototherapy, implying that primary etiologic factors of psoriasis may also contribute to anterior segment pathologies in these patients. Therefore, we are of the opinion that routine eye examinations are necessary in patients with psoriasis of all types, for early detection of subclinical eye pathologies. In addition, daily lid care should be encouraged in such patients. Further cooperative studies between specialties are needed to elucidate the prevalence and nature of ocular involvement in patients with psoriasis and to prevent severe complications in these patients.

References

1. Zivkovic D: Psoriasis. A dermatological enigma. Acta Med Croatica (1998) 52: 199–202.
2. Okamoto F, Umebayasi Y, Ohtsuka F and Hommura S: Factors associated with increased aqueous flare in psoriasis. Jpn J Ophthalmol (2001) 45: 172–176.
3. Iijima S, Iwata M and Otsuka F: Psoriatic arthritis and hypopyon-iridocyclitis. Possible mechanism of the association of psoriasis and anterior uveitis. Dermatology (1996) 193: 295–299.
4. Yamamato Y, Tada R, Shimomura Y and Yuasa T: A case of recurrent hypopyon uveitis with psoriasis pustulosa. Jpn J Clin Ophthalmol (1982) 36: 217–221.
5. Wagner G, Luckasen JR and Goltz RW: Mucous membrane involvement in generalized pustular psoriasis: Report of three cases and review of the literature. Arch Dermatol (1976) 112: 1010–1014.
6. Catsarou-Catsari A, Katsambas A, Theodoropoulos P and Stratigos J: Ophthalmological manifestations in patients with psoriasis. Acta Derm Venereol (1984) 64: 557–559.
7. Karabulut AA, Yalvac IS, Vahaboglu H, Nurozler AB and Duman S: Conjunctival impression cytology and tear-film changes in patients with psoriasis. Cornea (1999) 18: 544–548.
8. Zengin N, Tol H, Balevi S, Gunduz K, Okudan S and Endogru H: Tear film and meibomian gland functions in psoriasis. Acta Ophthalmol Scand (1996) 74: 358–360.
9. Arffa RC: Diseases of the skin; in Grayson's Diseases of the Cornea, 3 rd Ed, Mosby, St. Louis (1991) pp 539–542.
10. Knox DL: Psoriasis and intraocular inflammation. Trans Am Ophthalmol Soc (1979) 77: 210–224.
11. Okamoto F, Sato T, Umebayashi Y, Ohtsuka F and Hommura S: Quantitative evaluation of aqueous flare in psoriasis using a laser flare-cell meter. Nippon Ganka Gakkai Zasshi (1997) 101: 487–491.
12. Moadel K, Perry HD, Donnenfeld ED, Zagelbaum B and Ingraham HJ: Psoriatic corneal abscess. Am J Ophthalmol (1995) 119: 800–801.
13. Thorne JE, Volpe NJ and Liu GT: Magnetic resonance imaging of acquired Brown syndrome in a patient with psoriasis. Am J Ophthalmol (1999) 127: 233–235.
14. Ajitsaria R, Dale R, Ferguson V, Mayou S and Cavanagh N: Psoriasis, psoriatic arthropathy and relapsing orbital myositis. Clin Exp Dermatol (2001) 26: 274–275.
15. Cabral DA, Petty RE, Malleson PN, Ensworth S, McCormick AQ and Shroeder ML: Visual prognosis in children with chronic anterior uveitis and arthritis. J Rheumatol (1994) 21: 2370–2375.
16. Powles AV, Baker BS, Rutman AJ, McFadden JP, Valdimarsson H and Fry L: Epidermal rupture is the initiating factor for the Koebner response in psoriasis. Acta Derm Venereol (1990) 70: 35–38.
17. Phillips CI, Donnelly CA, Clayton RM and Cuthbert J: Skin disease and age-related cataract. Acta Derm Venereol (1996) 76: 314–318.
18. Gudmundsen KJ, O'Donnell BF and Powell FC: Schirmer testing for dry eyes in patients with rosacea. J Am Acad Dermatol (1992) 26: 211–214.