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Original Article

Clinical Characteristics of Uveitis in Patients with Psoriasis in Korea: A Retrospective Multicenter Case Series

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Purpose: To describe the clinical characteristics and treatment outcomes of uveitis in patients with psoriasis in Korea.

Methods: The medical records of 20 patients (27 eyes) with psoriatic uveitis in two tertiary hospitals were retrospectively reviewed. We analyzed data about patient demographics, uveitis types, laterality, onset of disease, human leukocyte antigen (HLA) types, intraocular pressure, visual acuity, comorbidities, and medical treatments and outcomes for uveitis and psoriasis.

Results: The cohort comprised 11 males and nine females (age of onset, 50.1 ± 13.2 years) and the mean follow-up period was 3.9 ± 4.0 years. Types of uveitis included anterior (85%), intermediate (10%), and panuveitis (5%). A total of 13 (65%) cases presented with unilateral involvement and 12 out of 18 patients (66.7%) were positive for HLA-B27. The average intraocular pressure of affected eyes was 11.6 ± 3.6 at the first visit and 13.8 ± 3.6 mmHg at the final visit. The average logarithm of the minimum angle of resolution visual acuity of affected eyes at the initial examination was 0.16 ± 0.52 and 0.27 ± 0.71 at the last examination. Most common comorbidity (13 patients, 65%) was psoriatic arthritis (PsA). All cases underwent topical corticosteroid treatment; however, 11 (55%) required systemic corticosteroid and immunosuppressants for the treatment of uveitis. Notable deterioration in visual outcome was found in two cases (10%) due to severe intraocular inflammation and its complications (uveitic glaucoma and bullous keratopathy). Recurrent uveitis was observed in 57.9% of patients. Patients with PsA tended to have higher positive rate of HLA-B27 (83.3%). However, there was no significant correlation between visual prognosis and location of psoriatic uveitis, presence of PsA, and HLA-B27 positivity.

Conclusions: Psoriatic uveitis in Koreans usually presents with anterior uveitis with unilateral involvement. PsA was the most common comorbidity. In majority of patients, visual outcomes are satisfactory with appropriate topical or systemic immunosuppressive treatment.

Key Words: HLA-B27 antigen, Psoriasis, Psoriatic arthritis, Psoriatic uveitis, Uveitis

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Psoriasis is a chronic disease, influenced genetically and environmentally, driven immunologically [1], and population-based studies in several countries have reported a prevalence of psoriasis ranging from 0.2% to 4.8% [2]. However, the prevalence of psoriasis in Asians have been

reported to be lower, specifically, Taiwan with 0.19% [3], Japan with 0.34% [4], and China with 0.3% [5], respectively. According to a population-based study using the Korean national health insurance database, standardized prevalence of psoriasis in Korea ranged from 0.44% to 0.45% [6], which was slightly higher than the other Asian countries.

The known comorbidities of psoriasis are cardiovascular disease, stroke, diabetes mellitus, renal disease, and arthritis [7], although a number of ocular findings have also been described to occur in 10% of patients [8]. In particular, chronic uveitis shows a predilection for those with psoriatic arthritis (PsA) [9], whereas, case series of 10 patients reported by Knox [10] supported uveitis developing in psoriatic patients without arthritis.

The clinical features of patients with both uveitis and psoriasis have been reported in Singapore [1], Japan [4], and China [5]. However, as there are currently no analytical data for Korean psoriasis-related uveitis patients, there is limitation in applying the results of previous studies. Therefore, the purpose of this study was to investigate the clinical features and treatment outcomes of Korean patients with psoriatic uveitis.

Materials and Methods

This was a multicenter retrospective study. The medical records of patients diagnosed with uveitis and psoriasis in South Korea between September 1995 and May 2020 were reviewed retrospectively through the Clinical Data Warehouse of Seoul National University Hospital and Seoul National University Bundang Hospital. Patients diagnosed with psoriasis clinically or pathologically by experienced dermatologist and uveitis by skilled ophthalmologist were included. Diagnosis of psoriasis was made based on the clinical findings which were suggestive of psoriasis such as silvery, scaly raised bumps with non-infectious pustules, usually found on scalp, elbows, knees, and buttocks [11] (typical clinical features of psoriasis are presented in Fig. 1A-1D). Biopsy was conducted in case of ambiguous diagnosis, excluding other conditions. Diagnosis of psoriatic uveitis was done after the exclusion of other types of uveitis based on the ocular and systemic symptoms plus laboratory test. If necessary, to determine any suspected underlying systemic or infectious disease, ancillary test including fundus photographs, optical coherence tomography, and fluorescein and indocyanine green angiography were conducted. Of the patients entered in the Clinical Data Warehouse, a total of 20 patients met the criteria. The main outcome measures were clinical features and treatment outcomes of Korean patients with psoriatic uveitis.

The demographics and clinical features including disease classification, laterality, treatment method, initial and final intraocular pressure (IOP) and visual acuity (VA), and human leukocyte antigens (HLA) types were recorded. As suggested by Lange et al. [12], very low vision of counting fingers or worse, were substituted to logarithm of the minimum angle of resolution (logMAR) values (finger count, 2.0; hand motion, 2.3; light perception, 2.6; no light perception, 2.9). Visual outcomes were classified into one of three groups according to a difference of the values between the first and the last logMAR VA: improvement (<-0.1), maintenance (-0.1 to +0.1), and deterioration (>+0.1).

The classification of uveitis was categorized into anterior, posterior, intermediate, or panuveitis; with anterior referring to the iris or ciliary body, posterior to the choroid or retina, intermediate to the vitreous, peripheral retina, and pars plana of the ciliary body, and panuveitis to generalized inflammation of entire uvea [13]. Categorization of psoriatic uveitis was based on the diagnosis made by the

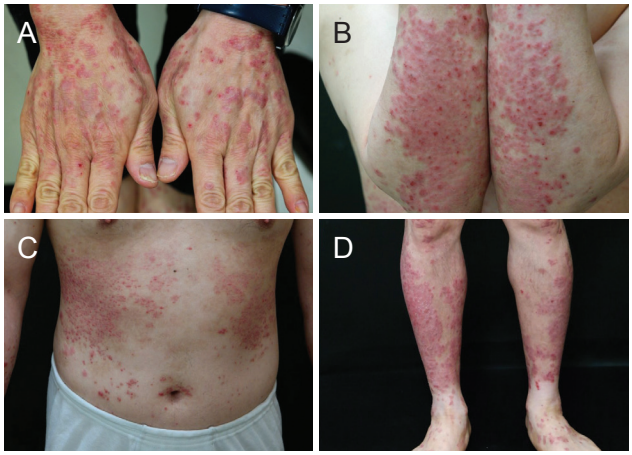

Fig. 1. Typical clinical appearance of psoriasis. A 49-year-old male with a history of psoriasis. After being diagnosed with uveitis in the left eye, oral and topical corticosteroid treatment were prescribed but microscopic inflammation was observed even after injection of subtenon triamcinolone acetonide. Methotrexate was administered for 15 months. (A) Back of hands, (B) forearms, (C) legs, and (D) abdomen showing typical morphology of psoriasis; sharply demarcated erythematous plaques. Informed consent was obtained from the patient for publication and any accompanying images.

treating ophthalmologists. The diagnosis was confirmed by ophthalmic examinations including slit lamp and fundus examinations and by multimodal imaging including fundus photography, optical coherence tomography, fluorescein and/or indocyanine green angiography.

Patients with PsA were further classified according to peripheral or axial involvement, the latter supported by the evidence of radiographic sacroiliitis and/or inflammatory back pain. The types of psoriasis treatment included topical steroid application, phototherapy, and systemic medication. Patients were defined as having severe psoriasis if they received treatment consistent with the severe disease, that is, treatment with biologic agents (tumor necrosis factor [adalimumab, etanercept, infliximab, and certolizumab], interleukin [IL]-12/23 [ustekinumab], and IL-17 [secukinumab, brodalumab, and ixekizumab]), cyclosporine, hydroxyurea, retinoids, or methotrexate [14], whereas the group with mild psoriasis consisted of people who had not received systemic therapy or phototherapy. In uveitis, systemic treatments consisted of oral corticosteroids, immunomodulatory agents such as methotrexate, mycophenolate mofetil, and azathioprine, local steroid injection, and biologic therapies. Additionally, approximate age of diagnosed psoriasis and uveitis was investigated through medical records and follow-up periods were also evaluated.

The data were analyzed using IBM SPSS Statistics ver. 22.0 (IBM Corp., Armonk, NY, USA). Data were presented as mean ± standard deviation. Pearson's correlation coefficients were calculated to explore the relationships between variables. The Fisher's exact test was used to compare categorical variables. A p-value of <0.05 was considered statistically significant.

The study was conducted according to the tenets of the Declaration of Helsinki and the institutional review board of Seoul National University Hospital and Seoul National University Bundang Hospital granted approval for collecting the clinical data used in the research with a waiver of informed consent (2006-214-1138 and B-2010-643-402).

Results

A total of 20 patients (27 eyes) were found to have psoriatic uveitis. Clinical features of the patients are summarized on Table 1. Age of disease onset was 50.1 ± 13.2 years (range, 21–70 years), and 11 of 20 (55%) patients were males. The onset age of diagnosis of psoriasis was 40.5 ± 12.8 years (range, 21–64 years) and of uveitis was 43.0 ± 14.2 years (range, 19–67 years). The difference between the time of diagnosis of psoriasis and the time of diagnosis of uveitis was evaluated. Twelve patients (60%) were diagnosed as having uveitis prior to psoriasis and the mean interval from uveitis to psoriasis diagnosis was 4.1 ± 2.9 years (range, 0.8–9.6 years). On the other side, eight patients (40%) were diagnosed as having uveitis after the diagnosis of psoriasis and the mean interval between the diagnosis was 6.8 ± 5.9 years (range, 0–16.9 years). Of the 19 patients that could be followed up for 12 months or longer, 11 (57.9%) experienced recurrence in uveitis. The average IOP at the first visit was 11.6 ± 3.6 and 13.8 ± 3.6 mmHg at the final visit. During the follow-up periods, except one patient with uveitic glaucoma (Fig. 2A, 2B), other patients showed no significant IOP fluctuation and IOP were well maintained. The average follow-up period was 3.8 ± 4.0 years (range, 0–16 years).

Of the 20 patients, seven (35%) had bilateral manifestation and 13 (65%) had unilateral manifestation. Anterior uveitis was the most common anatomical type, which accounted for 85% (17 patients) of cases, while two patients (10%) accounted for intermediate uveitis, and only one (5%) was diagnosed with panuveitis. In bilateral cases (seven patients), the types of uveitis was identical between the two eyes. Additionally, although various systemic complications were found in the majority of patients (16, 80%), arthritis was observed in 13 patients (65%) to be the most

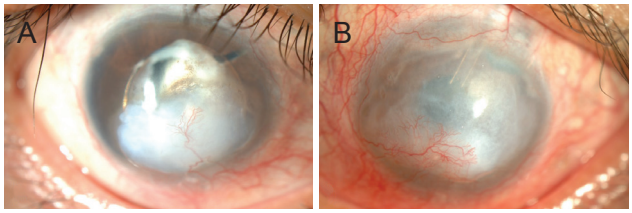

Fig. 2. Anterior segment photos of psoriatic uveitis case. A 47-year-old male with a history of uveitis and secondary glaucoma in both the eyes. During the follow-up period after trabeculectomy twice in the right eye and Ahmed glaucoma implant surgery in the left eye due to uncontrolled intraocular pressure, whole body skin lesions were developed and finally diagnosed as psoriasis on pathologic examination at dermatology. His final visual acuity was light sense perception in both the eyes. (A,B) Corneal opacity with neovascularization due to complication of uveitis in both the eyes. Informed consent was obtained from the patient for publication and any accompanying images.

Table 1. Demographic and Clinical characteristic of the study population

Variable	Value
Male : female	11 (55) : 9 (45)
Mean age at the onset of psoriasis (yr)	40.5 ± 12.8 (20.9–63.7)
Mean age at the onset of uveitis (yr)	43.0 ± 14.2 (18.1–66.9)
Preceded diagnosis and preceding period (yr)	
Diagnosis of psoriasis preceded (case)	12, 6.8 ± 5.9
Diagnosis of uveitis preceded (case)	8, 4.1 ± 2.9
Intraocular pressure (total 27 eyes, mmHg)	
Initial examination	11.6 ± 3.5 (5.0–17.0)
Final examination	13.3 ± 4.3 (6.0–19.0)
Location of uveitis	
Anterior	17 (85)
Intermediate	2 (10)
Posterior	0 (0)
Panuveitis	1 (5)
Recurrence	11 / 19 (57.9)
Bilateral : unilateral	7 (35) : 13 (65)
HLA-B27 (+)	12 / 18 (66.7)
Comorbidities	
Psoriatic arthritis	13 (65)
Axial psoriatic arthritis	10 (76.9)
Peripheral psoriatic arthritis	3 (23.1)
Hypertension	6 (30)
Diabetes mellitus	4 (20)
Dyslipidemia	2 (10)
Hypothyroidism	2 (10)
Cancer	4 (20)
Breast	2 (10)
Colon	1 (5)
Prostatic	1 (5)
Colitis	2 (10)
Systemic lupus erythematous	1 (5)
Sjogren syndrome	1 (5)
Anemia	1 (5)
Specific types of systemic treatment	
Oral corticosteroid	13 (65)
Immunosuppressant	
Methotrexate	11 (55)
Sulfasalazine	5 (25)
Cyclosporin	4 (20)
Mycophenolate	2 (10)

(Continuing)

Table 1. Continued

Variable	Value
Azathioprine	2 (10)
Biologics	
Etanercept	4 (20)
Adalimumab	4 (20)
Infliximab	2 (10)
Golimumab	2 (10)
Secukinumab	2 (10)
Guselkumab	1 (5)
No. of used systemic treatment	
1	6 / 19 (31.6)
2	4 / 19 (21.1)
3 or more	9 / 19 (47.4)
VA (total 27 eyes)	
Initial VA (logMAR)	0.16 ± 0.51 (-0.18–2.60)
Final VA (logMAR)	0.27 ± 0.70 (-0.08–2.60)
Improvement (logMAR)	4 eyes (14.8), -0.19 ± 0.07
Maintenance (logMAR)	19 eyes (70.4), 0.01 ± 0.06
Deterioration (logMAR)	4 eyes (14.8), 0.94 ± 0.99
Available follow-up period (yr)	3.8 ± 4.0

Values are presented as number (%), mean ± standard deviation, or mean ± standard deviation (range); Patients with glasses measure corrected VA and patients without glasses measured uncorrected VA; Visual outcomes were classified according to a difference of the values between the first and the last logMAR VA: improvement (<-0.1), maintenance (-0.1 to +0.1), and deterioration (>+0.1).
HLA = human leukocytes antigens; VA = visual acuity; logMAR = logarithm of the minimum angle of resolution.

common comorbidity. Among patients with arthritis, 11 (55%) had axial PsA, of which 8 had ankylosing spondylitis. There were two patients (10%) who showed no axial involvement and were classified into peripheral PsA. Other comorbid diseases included ulcerative pancolitis, ulcerative colitis, systemic lupus erythematosus, Sjogren's syndrome, breast cancer, colon cancer, prostatic cancer, anemia, hypertension, dyslipidemia, and diabetes mellitus. HLA-B27 was positive in 12 out of 18 patients (66.7%) tested. Among patients with PsA, HLA-B27 was positive in 82% (11 out of 13 patients). Table 2 summarizes the clinical features of patients with or without PsA and with or without HLA-B27. Most of the clinical features showed no significant difference between the groups. The proportion of HLA-B27 positivity was higher in the PsA (+) group than the PsA (-) group (83.3% vs. 33.3%, $p = 0.107$), however due to the small sample size, statistical significance was not found.

All cases underwent topical corticosteroids for the treatment of uveitis (corticosteroid eye drops) and psoriasis (corticosteroid cream, foam, and lotion). Local injection (subtenon, subconjunctival, and intravitreal) of dexamethasone or triamcinolone acetonide for the treatment of uveitis were administered in seven cases (35%). For the treatment of uveitis, 11 cases underwent systemic therapies. Systemic drugs used in ophthalmology for the treatment of uveitis were oral prednisolone and methotrexate, or both (11 patients, all cases), and two of these patients required additional mycophenolate prescription. Various systemic medications including biologics and immunosuppressants had been prescribed primarily in the internal medicine for the treatment of systemic comorbidities. There were seven patients who needed systemic medication for control of psoriasis and classified to be severe psoriasis but usually maintained with oral prednisolone and/or immunosuppressant. Among them, five patients received additional etaner-

Table 2. Clinical features of uveitis according to the presence of PsA and HLA-B27

Variable	PsA		*p*-value	HLA-B27		*p*-value
	(+)	(-)		(+)	(-)	
No. of patients	13 (65)	7 (24)	0.395	12 (66.7)	6 (33.3)	0.389
Mean age at the onset of uveitis (yr)	43.5 ± 11.9 (20.9–57.2)	41.9 ± 19.0 (22.0–66.9)	0.333	39.3 ± 12.1 (18.1–60.0)	53.4 ± 13.9 (32.0–67.0)	0.389
Bilateral : unilateral	4 (30.7) : 9 (69.2)	3 (42.9) : 4 (57.1)	-	4 (33.3) : 8 (66.7)	2 (33.3) : 4 (66.7)	-
Anterior uveitis	11 (84.6)	6 (85.7)	0.692	10 (83.3)	5 (83.3)	0.687
Recurrent uveitis	5 / 12 (41.7)	6 / 7 (85.7)	0.147	6 / 11 (54.5)	3 / 6 (50)	1.000
Initial VA (logMAR)	0.03 ± 0.12	0.38 ± 0.50	0.314	0.02 ± 0.10	0.21 ± 0.32	0.484
Final VA (logMAR)	-0.02 ± 0.15	0.63 ± 0.55	0.138	0.03 ± 0.08	0.33 ± 0.50	0.306
HLA-B27 (+)	10 / 12 (83.3)	2/6 (33.3)	0.107	-	-	-
PsA (+)	-	-	-	10 / 12 (83.3)	2 / 6 (33.3)	0.107
Biologics	8 / 13 (61.5)	1 / 7 (14.3)	0.070	7 / 12 (58.3)	1 / 6 (16.7)	0.152

Values are presented as number (%), mean ± standard deviation (range), or mean ± standard deviation; Patients with glasses measure corrected VA and patients without glasses measured uncorrected VA; $p < 0.05$ as statistically significant.
HLA = human leukocytes antigens; PsA = psoriatic arthritis; VA = visual acuity; logMAR = logarithm of the minimum angle of resolution.

Table 3. Characteristic of uveitis according to psoriasis severity

	Mild psoriasis*	Severe psoriasis†	*p*-value
No. of patients	13 (17 eyes) (65)	7 (10 eyes) (35)	-
Age (yr)	46.0 ± 13.3	57.6 ± 9.8	0.627
Bilateral : unilateral	4 (30.8) : 9 (69.2)	3 (42.9) : 4 (57.1)	0.651
Anterior uveitis	11 / 13 (84.6)	6 / 7 (85.7)	1.000
Recurrent uveitis	6 / 12 (50)	5 / 7 (71.4)	0.691
Initial visual acuity	0.17 ± 0.64 (-0.18–2.60)	0.16 ± 0.25 (-0.08–0.82)	0.393
Final visual acuity	0.35 ± 0.89 (-0.18–2.60)	0.15 ± 0.22 (-0.08–0.70)	0.243

Values are presented as number (%), mean ± standard deviation, or mean ± standard deviation (range); Patients with glasses measure corrected visual acuity and patients without glasses measured uncorrected visual acuity; $p < 0.05$ as statistically significant.
*Patients group treated only with topical application; †Patients group treated with biologic agent, systemic medication, and phototherapy.

cept injection and/or phototherapy. There was only one case that required selective inhibitor of IL-23 monoclonal antibody therapy (guselkumab) for the control of psoriasis. Of the seven patients with severe psoriasis, four patients (57.1%) also required systemic medication for the treatment of uveitis. The severe psoriasis group tended to show older age, bilateral involvement, higher recurrence and worse visual outcome without statistical significance (Table 3). Types of systemic medications and corresponding numbers of patients are listed in Table 1. Six patients were prescribed only one systemic medication (31.6%) and were prescribed either oral prednisolone or methotrexate. Nine patients were prescribed more than three kinds of drugs, accounting for 47.4%.

The average logMAR VA at the first visit was 0.16 ± 0.52 and 0.27 ± 0.71 at the last visit. In terms of visual outcome, improvement was observed in four eyes (14.8%), maintenance in 19 eyes (70.4%), and deterioration in four eyes (14.8%). Severe visual decline was observed in two patients: one patient had final visual acuities of light perception in both eyes due to uveitic glaucoma and bullous keratopathy in both eyes (Fig. 2). The other patient had acute

onset of severe intraocular inflammation with recurrent episodes. After being diagnosed with intermediate uveitis and receiving repeated treatment, the final visual acuity was 20 / 100. As a complication of recurrent anterior psoriatic uveitis, a 68-year-old female patient showed herpetic endothelitis and epiretinal membrane during the follow-up observation. She was undergoing systemic therapy for severe psoriasis and the logMAR VA was 0.82 at the first ophthalmic examination and 0.70 at the last examination. There was no significant correlation between visual prognosis and types of psoriatic uveitis, presence of PsA, and HLA-B27 positivity (p = 0.748, 0.813, and 0.145 respectively).

Discussion

In this study, we retrospectively evaluated the clinical features and treatment outcomes of 20 psoriatic uveitis patients in Korea. Psoriatic uveitis in Koreans appeared to present with anterior uveitis with unilateral involvement. PsA was the most common comorbidity. In majority of patients, visual outcomes were well maintained with proper treatment.

The relationship between uveitis and psoriasis is unsettled among researchers, with only a few studies having previously investigated the association between psoriasis and uveitis [3-5,15-17]. To our knowledge, this is the first report of psoriasis and uveitis in Korea and it has its importance in this respect. The association between uveitis and PsA has been evaluated [9]. One study suggested that uveitis may be an early indicator of inflammation and possibly predict the development of PsA [15]. However, of the patients seen our study, the long period of disease did not indicate developing PsA, and there were cases where PsA occurred even in a short period of disease.

There was no significant correlation between bilaterality of involved eye(s) and duration of illness. The percentage of unilateral involvement in our study was 65% (13 out of 20 patients), which is consistent with the prior report (46%–75%) [16]. The analysis of the anatomical localization of uveitis in our patients revealed a preferential involvement of the anterior compartment, in agreement with other studies [4,5,18]. Intermediate uveitis was not reported in previous population based studies conducted in Japanese and Chinese patients [4,5], but two patients were identified in our study. Compared with Korean patients (40.5 years), psoriasis occurred at an earlier age in Chinese and Japanese patients (29.7 and 24.2 years, respectively), whereas the onset period of uveitis (43.0 years) was similar with previous studies (38.8 and 42.8 years, respectively) [4,5]. In terms of recurrence rate, the Korean patients (57.9%) were found to be less than that of a study conducted in China and Japan (72.5% and 69.2%, respectively) [4,5].

Psoriasis is thought to be driven by T-helper (Th) 1 and Th17 cells, and studies have revealed that the pathogenesis of uveitis also includes Th17- and Th1-dependent immune responses [19]. Moreover, many other proinflammatory mediators (such as IL-2, IL-6, and tumor necrosis factor) that probably contribute to the pathogenesis of psoriasis have been found in increased concentrations in the aqueous humor of patients with uveitis [19]. Since two diseases have a common denominator as described above, some studies have found that the average period from the onset of psoriasis to the onset of uveitis was 15.2 years [20]. However, in this present study, the mean period from onset of psoriasis to onset of uveitis was 2.5 ± 7.3 years, which is shorter than previous studies [4,5]. In the majority of our patients (12 cases, 60%) psoriasis occurred before uveitis which is consistent with previous reports [4], but in 8 cases (40%), uveitis preceded the development of the skin lesions. These results suggest that caution should be exercised in follow-up of uveitis patients as those connected diseases may appear over the years and it is not known which disease will appear first.

The association between psoriatic uveitis and various systemic disease is well known. In our study, 16 patients (80%) had systemic or local diseases (Table 1), where the most common systemic disease was PsA (13 patients, 65%). It has been demonstrated that the HLA-B27 is associated with spondyloarthropathies as a major histocompatibility complex class I gene thought to be responsible for antigen presentation to autoreactive cytotoxic T-cells [17]. In our study, 18 patients received the HLA-B27 test, 12 (66.7%) of which were positive for HLA-B27. Among patients with HLA-B27 (+), 10 patients (83.3%) had PsA as comorbid disease. Besides HLA-B27, certain other genetic factors, such as polymorphisms in the IL-23 receptor gene have been shown to confer risk to PsA, ankylosing spondylitis, and uveitis, supporting the theory of a common disease pathway [21]. However, significant correlation be-

tween HLA-B27 and clinical manifestation of uveitis was not found in this study (Table 2). Although several studies demonstrated an association between HLA-B27 and psoriatic uveitis, still the relationship is not fully understood [18,22]. Further studies on a large scale with controlled cohort are required for conclusion.

Psoriasis is a multisystem inflammatory disease, and thus systemic treatment must be considered in collaboration with a dermatologist and rheumatologist. In our study, all cases had topical corticosteroid treatment for psoriatic uveitis, and majority of cases received supplemental therapies including systemic corticosteroids, immunosuppressants, and other biologics for the treatment of systemic disease (such as PsA and colitis) (Table 1).

Follow-up of the patients showed that most patients responded well to the treatments, thus the prognosis of visual outcome remained similar or improved compared with initial examination. There were 23 eyes (85.2%) with no difference or improvement compared to the first and last VA. Interestingly, recurrent uveitis was lower in the group with PsA (41.7%, 5 out of 12 patients) than in the group without PsA (85.7%, 6 out of 7 patients). Meanwhile, use of biologics was higher in the group with PsA than in the group without PsA (61.5% vs. 14.3%). Based on these results, it can be inferred that the recurrence of uveitis may have been suppressed by using intensive maintenance treatment including biologic agents. Notable deterioration in visual outcome was observed in two patients. Those patients had severe form of uveitis from the beginning or had secondary glaucoma and bullous keratopathy as a complication of uveitis at the same time. Although the prognosis of visual outcome was well maintained in the majority of patients in this present study, large-scale studies over a longer period of follow-ups are required for this conclusion.

Our study has limitations to be noted. First, due to the retrospective nature of the study, workup and treatment protocols were not standardized and there might have been a selection bias. In addition, the effect of treatments on uveitis could not be assessed, either. Second, the insufficient statistical power from the small number of included cases can be the reason for the failure in revealing the associations such as HLA-B27 positivity and PsA. Further prospective studies including larger number of patients are needed in the future.

In conclusion, psoriatic uveitis in Korea may appear before or after the diagnosis of psoriasis. The most common comorbid disease is arthritis, in which case HLA-B27 showed a high positive rate. With proper treatment, VA is generally well maintained in a majority of patients. Therefore, dermatologists and rheumatologist should keep in mind with ophthalmic problems and refer their patients who complain ocular symptoms to the ophthalmologist. Meanwhile, an ophthalmologist managing uveitis patients should also be aware of systemic diseases and advise their patients to undergo comprehensive examination and receive the necessary treatment.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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