for bipolar disorder, 1.72 (95% CI, 1.49-1.98) for unipolar depression, 1.88 (95% CI, 1.08-3.30) for generalized anxiety disorder, and 2.06 (95% CI, 1.55-2.73) for personality disorders. The risk of mental disorders among individuals with psoriasis who had completed short-term education presented with an HR of 2.18 (95% CI, 1.95-2.44), while those who had attained medium- and long-term educational levels demonstrated HRs of 1.45 (95% CI, 1.26-1.67) and 1.40 (95% CI, 1.11-1.78), respectively.

Discussion | Our findings are in agreement with those of previous research, indicating a higher risk of depression among individuals with psoriasis.[1] Furthermore, our findings suggest a higher risk of bipolar disorder among those with psoriasis than among matched controls. To our knowledge, no studies have evaluated bipolar disorder in the context of psoriatic pathogenesis; however, a heightened risk of bipolar disorder among individuals with psoriasis is in line with hypotheses suggesting an inflammation-mediated induction and/or progression of bipolar disorder.[3] Similarly, immune dysregulation has been suggested to play a pivotal role in schizophrenia.[4] We also found an increased risk of vascular dementia among individuals with psoriasis. It has been reported that the prevalence of mild cognitive impairment is higher among individuals with psoriasis[5] and that the risk of death due to dementia may be elevated among individuals with psoriasis.[6] However, to our knowledge, no previous, larger studies have determined the risk of dementia within this patient population. The findings reported herein support the need for an approach when treating individuals with psoriasis that focuses not only on their dermatologic condition, but also on their mental health.

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Association of Psoriasis With Mental Health Disorders in South Korea

Psoriasis is a chronic inflammatory skin disorder that affects 3% of the white population in the United States and is known to decrease patients' health-related quality of life.[1] There have been many studies demonstrating that patients with psoriasis have more depressive symptoms and mental health comorbidities than healthy controls.[1-3] However, there have been few studies on how long it takes for these mental health comorbidities to appear after the diagnosis of psoriasis.

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Methods | We obtained population-based data (n = 1 116 789) from South Korea's Health Insurance Research and Assessment Agency from 2002 to 2013. The patients with mental disorders and psoriasis were identified using the following diagnostic codes from the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10)*: psoriasis (L40), depressive episode (F32), other anxiety disorders (F41), acute stress reaction (F43), somatoform disorders (F45), other neurotic disorders (F48), and nonorganic sleep disorders (F51).

We estimated the prevalence and sex- and age-adjusted odds ratios of mental health disorders in patients with psoriasis

Table 1. Three-Year Risk of Mental Disorder in Patients With Psoriasis

Mental Disorder	Odds Ratio (95% CI)	
	Age- and Sex-Adjusted Model	Adjusted for Comorbid Diseases[a]
Depressive episode		
Control	1 [Reference]	
Patients with psoriasis	2.19 (1.97-2.44)	1.99 (1.79-2.22)
Anxiety disorders		
Control	1 [Reference]	
Patients with psoriasis	2.92 (2.67-3.20)	2.649 (2.42-2.91)
Acute stress reaction		
Control	1 [Reference]	
Patients with psoriasis	1.25 (0.99-1.58)	1.207 (0.96-1.52)
Somatoform disorders		
Control	1 [Reference]	
Patients with psoriasis	2.62 (2.24-3.08)	2.347 (1.999-2.76)
Neurotic disorders		
Control	1 [Reference]	
Patients with psoriasis	2.66 (2.29-3.09)	2.417 (2.29-3.09)
Nonorganic sleep disorders		
Control	1 [Reference]	
Patients with psoriasis	2.58 (2.27-2.93)	2.292 (2.02-2.60)

[a] Adjusted for coronary heart disease, cerebrovascular disease, diabetes mellitus, and hyperlipidemia.

Table 2. Risk and Time to Onset of Mental Health Disorders in 12 762 Men and Women With Psoriasis

Mental Disorder	Men		Women		Total	
	Probability of Occurrence, %	Time to Onset, d	Probability of Occurrence, %	Time to Onset, d	Probability of Occurrence, %	Time to Onset, d
Anxiety disorders	0.14	112.6	0.14	53.0	0.14	86.1
Acute stress reaction	0.03	24.0	0.04	98.5	0.03	61.3
Depressive episode	0.07	54.4	0.18	267.9	0.12	196.7
Neurotic episode	0.16	280.4	0.16	155.4	0.16	224.2
Nonorganic sleep disorders	0.01	43.0	0.09	104.4	0.05	94.2
Somatoform disorders	0.16	80.4	0.09	99.2	0.13	86.3

using logistic regression. The parameters for the sequential pattern mining were based on the values of the probability of occurrence and the time to onset of mental disorders after the diagnosis of psoriasis using the SAS Enterprise Miner version 13.2 (SAS Institute). The study design was approved by the Ethics Committee of Seoul St Mary's Hospital, the Catholic University of Korea, and followed all relevant principles of the Declaration of Helsinki. Informed consent was waived owing to the nature of the study.

Results | The final study population included 12 762 patients with psoriasis. The risk of depressive episodes, anxiety disorders, somatoform disorders, neurotic disorders, and nonorganic sleep disorders were 2.19, 2.92, 2.62, 2.66, and 2.58 times higher in patients with psoriasis than in control patients, which were slightly attenuated after adjusting for covariates (**Table 1**).

The probabilities of the occurrence of depressive episodes, anxiety disorders, somatoform disorders, neurotic disorders. and nonorganic sleep disorders after the diagnosis of psoriasis were 0.12%, 0.14%, 0.13%, 0.16%, and 0.05%, respectively; the times to onset were 196.7, 86.1, 86.3, 224.2, and 94.2 days, respectively (**Table 2**). In men, somatoform disorders and neurotic disorders were the most common. Additionally, for men, it took 80.4 days and 280.4 days to develop somatoform disorders and neurotic disorders, respectively. In women, depressive episodes were the most common, with a 0.18% probability of occurrence and a mean time to onset of 267.9 days. On average, it took 53.0 days for women patients with psoriasis to develop anxiety disorders.

Discussion | This study investigated the risk and time to onset of mental health disorders in patients with psoriasis. Similar to previous studies, the risk of mental health disorders in patients with psoriasis was higher than in controls.[1-3] Recent studies have suggested that the helper T cell type 17 (T_H17) axis might play a role in neuroimmune interactions, including anxiety disorders and depression.[4-6] Because psoriasis is a typical T_H17-related chronic disease, the prevalence of mental health disorders in patients with psoriasis may be higher than in healthy control individuals.

In patients with psoriasis, mental health disorders were shown to occur within 2 or 3 months of diagnosis. Men tended to have a shorter time to onset for most mental health disorders than women, except for neurotic disorders and anxiety disorders. Therefore, when patients are diagnosed with psoriasis, multidisciplinary teams consisting of dermatologists

and psychiatrists should be involved in the early stages of treatment.

The limitation of our study is that we could not measure the actual disease duration between psoriasis and the mental health disorders. However, our study was strengthened by the use of standardized, large-population data to identify an association between psoriasis and mental health disorders.

The present results demonstrate that psoriasis is associated with a higher risk for developing mental health disorders; therefore, dermatologists should play a role in detecting mental health disorders in patients with psoriasis, and in assembling a multidisciplinary team of medical professionals to treat these patients.

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Frequency of Contact Allergy to Implanted Cardiac Devices

Allergic contact dermatitis associated with implanted cardiac devices is rare. This study evaluates patients who underwent cardiac implant patch testing.

Methods | This retrospective study used data from a preexisiting database repository and was approved by the Duke University Health System Institutional Review Board, which also provided waiver for individual consent. Adult patients who underwent cardiac implant patch testing from March 1, 2012, to September 15, 2017, at Duke University School of Medicine's Department of Dermatology were included. Data from patch test results were recorded in REDCap.[1]

Allergens were obtained from Chemotechnique (Sweden), Allergeaze (SmartPractice Canada), and cardiac device companies. Allergens were applied on Finn Chambers (SmartPractice USA) with Scanpor Tape (Norgesplaster; Norway). Readings were completed on D2 and D4/D5 in accordance with International Contact Dermatitis Research Group criteria.[2] Relevance was designated as definite, probable, possible, past, or unknown.[3]

Results | Of the 11 patients who completed 15 patch test sessions, the mean (SD) age was 58.4 (15.6) years, and 3 (27%) were women. Six patients had pacemakers implanted, and 5 patients had implantable cardioverter defibrillators implanted. Clinical characteristics are summarized in **Table 1**. Common indications for patch testing were concern for allergy, skin eruption, skin symptoms, and concern for infection. Common symptoms included pruritus and pain. Erythema was noted at the implant scar in 8 patients (72.7%).

Table 2 summarizes device data and patch test results.[4] Eight patients (72.7%) underwent device extraction. Duration of device implantation prior to extraction was 1 to 77 months if extracted before patch testing and 1 to 11 months if extracted after patch testing. Six patients (55%) had relevant positive patch test reactions, and 4 (36%) of these included reactions to metals. Other positive patch test results included reactions to rubber accelerators, lidocaine, silicone, and a device-related dexamethasone plug. Six patients underwent device extraction prior to patch testing, and 1 patient underwent extraction 4 months after patch testing. Patient 2 underwent extraction prior to the first negative patch test result; a new device was placed, and symptoms recurred. Additional testing revealed relevant allergens, but an alternative device could not be identified. Treatment with maintenance prednisone was required to avoid recurrent reaction.

Culture data were available for 7 patients who underwent extraction (Table 1). Five cultures had negative results. Based