INTRODUCTION

Psoriasis is one of the most frequent chronic inflammatory skin diseases.\(^1\)\(^,\)\(^2\) It is a well-known fact that race, genetic background, and environmental factors affect the onset of psoriasis.\(^3\) The prevalence of psoriasis varies with country, and psoriasis can appear at any age. The Japanese Society for Psoriasis Research (JSPR) has conducted annual epidemiological surveys of patients with psoriasis since 1982.\(^4\)\(^-\)\(^6\) Kawada et al.\(^4\) reported 28,628 cases that were enrolled during 1982–2001, Takahashi et al.\(^5\) reported 11,631 cases during 2002–2008 while Ito et al.\(^6\) reported 9,290 cases during 2009–2012. These results have provided significant information, such as changes in the age at onset, comorbidities, and treatment trends. In the past decade, biologics were developed and approved for the treatment of psoriasis. As of 2018, seven biologics were available in Japan: two tumor necrosis factor-\(\alpha\) inhibitors, infliximab and adalimumab; one anti-interleukin (IL)-12/23p40 antibody, ustekinumab; three IL-17 inhibitors, secukinumab, ixekizumab, and brodalumab; and one anti-IL-23p19 antibody, guselkumab. Biologics have dramatically changed the treatment and management of psoriasis. The purpose of this study was to conduct the recent epidemiological analysis of the patients with psoriasis who were enrolled in the JSPR from 2013 to 2018.

METHODS

The JSPR partners with medical institutions throughout Japan. It uses its own questionnaire to perform annual surveys and collect information. This survey includes significant information regarding the recent perspective of psoriasis in the Japanese Society, especially focusing on the treatment trends after the introduction of biologics.
data regarding newly diagnosed psoriasis cases (from April of the previous year to March of the survey year). A total of 132 medical institutions participated in the surveys for the present study, conducted from 2013 to 2018. The survey was designed to acquire information about patients’ characteristics, lifestyle habits, disease severity, family history, past history, comorbidities, exacerbating factors, focal infection, distribution of lesions, and current treatments. Only data from completed surveys were included. This study was approved by the ethics committee of Kindai University for the data obtained from 2013 to 2016 and Jichi Medical University for the data from 2017 to 2018 as they acted as the central institutes overseeing the entire survey.

3 | RESULTS

3.1 | Population

This study included all types of psoriasis, such as psoriasis vulgaris, guttate psoriasis, psoriatic arthritis, erythrodermic psoriasis, and generalized pustular psoriasis. A total of 15,287 cases were enrolled from 2013 to 2018, out of which 65.3% (9,989 cases) were male and 34.7% (5,298 cases) were female. The age at which the patients were initially diagnosed varied from 0 to 100 years. The mean ± standard deviation (SD) age of the patients was 53.8 ± 17.2 years (males, 54.1 ± 16.5; females, 53.2 ± 18.5). The age distributions were 119 patients aged 0–9 years (0.8%; 62 boys [0.6%] and 57 girls [1.1%]), 274 aged 10–19 years (1.8%; 125 boys [1.3%] and 149 girls [2.8%]), 947 aged 20–29 years (6.2%; 539 men [5.4%] and 408 women [7.7%]), 1,836 aged 30–39 years (12.1%; 1,208 men [12.1%] and 628 women [11.9%]), 2,915 aged 40–49 years (19.1%; 2,028 men [20.4%] and 887 women [16.8%]), 3,030 aged 50–59 years (19.9%; 1,912 men [19.2%] and 1,118 women [21.2%]), 3,139 aged 60–69 years (20.6%; 2,211 men [22.2%] and 928 women [17.6%]), 2,123 aged 70–79 years (13.9%; 1,383 men [13.9%] and 740 women [14.0%]), 768 aged 80–89 years (5.0%; 455 men [4.6%] and 313 women [5.9%]), and 80 aged 90 years or older (0.5%; 29 men [0.3%] and 51 women [1.0%]) (Figure 1).

3.2 | Age at onset

The ages at disease onset were 0–9 years for 266 patients (2.0%; 120 boys [1.4%] and 146 girls [3.1%]), 10–19 years for 1,103 patients (8.1%; 580 boys [6.5%] and 523 girls [11.1%]), 20–29 years for 2,079 patients (13.6%; 1,332 boys [14.0%] and 747 girls [15.2%]), 30–39 years for 3,066 patients (20.1%; 2,010 boys [21.3%] and 1,056 girls [21.5%]), 40–49 years for 2,987 patients (19.5%; 2,030 boys [21.6%] and 957 girls [19.5%]), 50–59 years for 2,256 patients (14.7%; 1,567 boys [16.8%] and 689 girls [14.1%]), 60–69 years for 1,976 patients (12.9%; 1,411 boys [14.9%] and 565 girls [11.6%]), 70–79 years for 1,397 patients (9.1%; 1,032 boys [11.0%] and 365 girls [7.5%]), 80–89 years for 760 patients (5.0%; 477 boys [5.1%] and 283 girls [5.7%]), and 90 years or older for 80 patients (0.5%; 42 boys [0.5%] and 38 girls [0.8%]) (Figure 1).

FIGURE 1 Age and sex distribution
2238 patients (16.4%; 1512 men [17.0%] and 726 women [15.3%]), 30–39 years for 2370 patients (17.4%; 1710 men [19.3%] and 660 women [14.0%]), 40–49 years for 2247 patients (16.5%; 1573 men [17.7%] and 674 women [14.2%]), 50–59 years for 2151 patients (15.8%; 1392 men [15.7%] and 759 women [16.0%]), 60–69 years for 1836 patients (13.5%; 1190 men [13.4%] and 646 women [13.7%]), 70–79 years for 1075 patients (7.9%; 646 men [7.3%] and 429 women [9.1%]), 80–89 years for 302 patients (2.2%; 152 men [1.7%] and 150 women [3.2%]), and 90 years and older for 23 patients (0.2%; 5 men [0.1%] and 18 women [0.4%]) (Figure 2).

### 3.3 Patient characteristics

The mean ± SD height (cm) of the patients was 163.90 ± 10.84 (males, 168.12 ± 9.26; females, 155.40 ± 8.56). The mean ± SD weight (kg) was 64.44 ± 13.68 (males, 68.31 ± 12.54; females, 56.76 ± 12.58). The mean ± SD body mass index (BMI) was 23.86 ± 4.12 (males, 24.08 ± 3.77; females, 23.43 ± 4.71). Some patients consumed alcohol (24.3%; males, 29.2%; females, 14.7%) and/or smoked (26.1%; males, 32.1%; females, 14.7%). Some patients had an atopic disposition (4.4%; males, 3.8%; females, 5.6%).

### 3.4 Severity

Psoriasis patients with less than 5%, 5–10%, and more than 10% of the affected body surface area were 36.6% (males, 32.5%; females, 44.7%), 27.0% (males, 27.0%; females, 26.9%), and 36.3% (males, 40.5%; females, 28.4%), respectively (Table 1). Male patients, usually, had a more severe disease than the female patients.

### 3.5 Family history

Approximately 4.6% of the patients had a family history of psoriasis (males, 4.3%; females, 5.1%). The affected family members included fathers (35.6%; males, 36.5%; females, 34.1%), mothers (20.8%; males, 18.7%; females, 24.1%), children (8.9%; males, 9.8%; females, 7.4%), and siblings (28.7%; males, 29.3%; females, 27.8%).

### 3.6 Past history and comorbidities

Approximately 50.0% of the cases had past history and comorbidities (males, 52.8%; females, 44.9%). The patients’ past histories and

**FIGURE 2** Age at onset
comorbidities included hypertension (42.0%; males, 43.4%; females, 39.0%), dyslipidemia (30.0%; males, 30.0%; females, 30.0%), diabetes mellitus (23.7%; males, 25.2%; females, 20.2%), hyperuricemia (15.1%; males, 19.1%; females, 6.3%), cardiovascular disease (6.0%; males, 7.1%; females, 3.6%), and cerebral vascular disorders (6.0%; males, 6.6%; females, 4.8%) (Table 2). More male patients suffered from past history and comorbidities like hyperuricemia and cardiovascular disease than the female patients.

### 3.7 Exacerbating factors

Approximately 34.7% of the cases had exacerbating factors (males, 34.1%; females, 35.8%). The exacerbating factors included stress (41.9%; males, 43.5%; females, 39.4%), certain seasons (31.2%; males, 32.2%; females, 29.6%), infection (19.7%; males, 18.8%; females, 21.1%), certain drugs (11.4%; males, 12.5%; females, 9.7%), sun exposure (4.7%; males, 4.6%; females, 4.7%), and pregnancy (3.3%; males, 0.3%; females, 8.0%) (Table 3). The percentages of patients with seasonal exacerbations that occurred in spring, summer, autumn, and winter were 22.0% (males, 19.7%; females, 25.8%), 15.7% (males, 13.0%; females, 20.2%), 5.9% (males, 6.3%; females, 5.2%), and 61.7% (males, 68.5%; females, 50.4%), respectively. Approximately 26.7% and 5.3% of the patients had a history of exacerbation due to certain antihypertensive drugs (males, 31.5%; females, 17.3%) and interferon (males, 6.8%; females, 2.5%), respectively.

### 3.8 Focal infection

Approximately 4.1% of the cases had some kind of a focal infection (males, 3.7%; females, 4.8%). Of these, 58.6% had tonsillitis (males, 53.4%; females, 66.3%).

### TABLE 1 Severity

|                | Male (%) | Female (%) | All (%) |
|----------------|----------|------------|---------|
| BSA < 5%       | 32.5     | 44.7       | 36.6    |
| BSA 5%–10%     | 27.0     | 26.9       | 27.0    |
| BSA > 10%      | 40.5     | 28.4       | 36.3    |

Abbreviation: BSA, body surface area.

### TABLE 2 Past history and comorbidities

| Comorbidity           | Males (%) | Females (%) | All (%) |
|-----------------------|-----------|-------------|---------|
| Hypertension          | 43.4      | 39.0        | 42.0    |
| Dyslipidemia          | 30.0      | 30.0        | 30.0    |
| Diabetes mellitus     | 25.2      | 20.2        | 23.7    |
| Hyperuricemia         | 19.1      | 6.3         | 15.1    |
| Cardiovascular disease| 7.1       | 3.6         | 6.0     |
| Cerebral vascular disorders | 6.6 | 4.8 | 6.0 |

### TABLE 3 Exacerbating factors

| Exacerbating Factor | Males (%) | Females (%) | All (%) |
|---------------------|-----------|-------------|---------|
| Stress              | 43.5      | 39.4        | 41.9    |
| Seasonal factors    | 32.2      | 29.6        | 31.2    |
| Infection           | 18.8      | 21.1        | 19.7    |
| Drug                | 12.5      | 9.7         | 11.4    |
| Sun exposure        | 4.6       | 4.7         | 4.7     |
| Pregnancy           | 0.3       | 8.0         | 3.3     |

### 3.9 Distribution of skin lesions at first examination

The skin lesions were either located on the scalp (50.4%; males, 54.7%; females, 42.3%), face (30.6%; males, 33.6%; females, 24.9%), ear (19.3%; males, 20.6%; females, 16.8%), neck (18.3%; males, 19.7%; females, 15.8%), chest (38.8%; males, 41.9%; females, 32.8%), abdomen (46.4%; males, 49.5%; females, 40.6%), upper extremities excluding the hand (61.7%; males, 63.2%; females, 58.9%), the hand (30.2%; males, 31.3%; females, 28.3%), lower extremities excluding the foot (71.1%; males, 73.5%; females, 66.7%), the foot (24.2%; males, 25.3%; females, 22.2%), nails (26.5%; males, 29.4%; females, 21.1%), back (52.0%; males, 56.1%; females, 44.4%), buttocks (39.0%; males, 41.5%; females, 34.2%), or genitalia (14.0%; males, 15.5%; females, 11.0%) at the first examination (Figure 3).

### 3.10 Treatments

Treatments are summarized in Table 4, and the treatment trends are shown in Figures 4–7 and Figures S1–S4. Approximately 68.9% of the patients received topical therapy (males, 69.1%; females, 68.6%). Topical therapy included corticosteroids (61.7%; males, 62.9%; females, 59.3%), vitamin D3 (57.6%; males, 58.4%; females, 56.0%), corticosteroid/vitamin D3 combinations (52.8%; males, 52.2%; females, 53.8%), tacrolimus (0.7%; males, 0.7%; females, 0.6%), and others (4.0%; males, 3.9%; females, 4.2%) (Table 4).

Approximately 9.1% of the cases received phototherapy (males, 8.8%; females, 9.7%). The phototherapy included psoralen and ultraviolet A (PUVA) (1.9%; males, 3.1%; females, 0.0%), narrowband (NB) ultraviolet B (UVB) (86.1%; males, 88.8%; females, 81.7%), broadband (BB)-UVB (0.6%; males, 1.0%; females, 0.0%), and targeted UVB (11.4%; males, 7.1%; females, 18.3%). Only three male patients received PUVA. More female patients received targeted UVB than the male patients.

Systemic therapy can be divided into two groups: oral medication and the biologics. Approximately 26.6% of the cases were treated with oral medication (males, 26.9%; females, 26.1%). Oral medication included etretinate (21.1%; males, 22.2%; females, 19.0%), methotrexate (16.9%; males, 17.6%; females, 15.7%), cyclosporin (27.4%; males, 28.3%; females, 25.6%), apremilast (16.3%; males, 15.8%; females, 17.2%), corticosteroids (8.7%; males, 8.9%;
females, 8.5%), non-steroidal anti-inflammatory drugs (NSAIDs) (4.3%; males, 3.6%; females, 5.7%), and others (19.2%; males, 17.4%; females, 22.8%). Approximately 18.6% of the cases were treated with biologics (males, 20.2%; females, 15.7%). Biologics included infliximab (17.6%; males, 17.6%; females, 17.5%), adalimumab (23.3%; males, 22.7%; females, 24.6%), ustekinumab (21.4%; males, 22.6%;
females, 18.4%), secukinumab (11.6%; males, 11.2%; females, 12.5%), ixekizumab (7.6%; males, 7.6%; females, 7.5%), brodalumab (6.3%; males, 6.1%; females, 6.9%), guselkumab (4.3%; males, 4.1%; females, 4.7%), biosimilars (0.0%; males, 0.0%; females, 0.0%), and others (10.5%; males, 10.6%; females, 10.2%).

### DISCUSSION

In the present survey, a total of 15,287 cases were enrolled from 2013 to 2018 from 132 medical institutions. The male:female ratio was 1.89:1 (9,989 male patients [65.3%] and 5,298 female patients [34.7%]). In the previous JSPR surveys, Kawada et al.\(^4\) reported a ratio of 1.92:1, Takahashi et al.\(^5\) 1.98:1, and Ito et al.\(^6\) 2.08:1. Kubota et al.\(^7\) reported a ratio of 1.44:1 in the previous Japanese claims-based survey. Ogawa et al.\(^8\) reported a ratio of 2.50:1 in the Japanese non-metropolitan regional area survey. In other Asian countries, the ratios have ranged from approximately 1.20:1 to 1.60:1.\(^9\)–\(^12\) A previous systematic review concluded that there was no difference in the prevalence of psoriasis between sexes.\(^13\) Therefore, it appears that the male predominance is a distinctive feature in Japanese patients with psoriasis.

In age distribution, the proportion of the patients increased gradually after the age of 20 years, peaked in the 60–69-year-old group, and then subsequently decreased (Figure 1). A previous systematic review also revealed that the prevalence of psoriasis increased with age.\(^13\) The peak proportions of both male and the female patients

### TABLE 4 Treatments for psoriasis

| Treatment                      | Males     | Females    | All        |
|--------------------------------|-----------|------------|------------|
|                                | No. of patients | %          | No. of patients | %          | No. of patients | %          |
| Topical therapy                | 6899      | 69.1       | 3637       | 68.6       | 10,536         | 68.9       |
| Corticosteroids                | 4342      | 62.9       | 2155       | 59.3       | 6497           | 61.7       |
| Vitamin D\(_3\)                | 4029      | 58.4       | 2036       | 56.0       | 6065           | 57.6       |
| Corticosteroid/vitamin D\(_3\) | 3600      | 52.2       | 1958       | 53.8       | 5558           | 52.8       |
| Tacrolimus                     | 51        | 0.7        | 23         | 0.6        | 74             | 0.7        |
| Others                         | 269       | 3.9        | 154        | 4.2        | 423            | 4.0        |
| Phototherapy                   | 98        | 8.8        | 60         | 9.7        | 158            | 9.1        |
| PUVA                           | 3         | 3.1        | 0          | 0.0        | 3              | 1.9        |
| NB-UVB                         | 87        | 88.8       | 49         | 81.7       | 136            | 86.1       |
| BB-UVB                         | 1         | 1.0        | 0          | 0.0        | 1              | 0.6        |
| Targeted UVB                   | 7         | 7.1        | 11         | 18.3       | 18             | 11.4       |

**Systemic therapy**

| Treatment                      | No. of patients | %          | No. of patients | %          | No. of patients | %          |
|--------------------------------|-----------------|------------|-----------------|------------|-----------------|------------|
| Oral medication                | 2689            | 26.9       | 1381            | 26.1       | 4070            | 26.6       |
| Etretinate                     | 597             | 22.2       | 263             | 19.0       | 860             | 21.1       |
| Methotrexate                   | 472             | 17.6       | 217             | 15.7       | 689             | 16.9       |
| Cyclosporin                    | 760             | 28.3       | 354             | 25.6       | 1114            | 27.4       |
| Apremilast                     | 425             | 15.8       | 237             | 17.2       | 662             | 16.3       |
| Corticosteroids                | 238             | 8.9        | 117             | 8.5        | 355             | 8.7        |
| NSAIDs                         | 97              | 3.6        | 79              | 5.7        | 176             | 4.3        |
| Others                         | 468             | 17.4       | 315             | 22.8       | 783             | 19.2       |
| Biologics                      | 2015            | 20.2       | 832             | 15.7       | 2847            | 18.6       |
| Infliximab                     | 354             | 17.6       | 146             | 17.5       | 500             | 17.6       |
| Adalimumab                     | 457             | 22.7       | 205             | 24.6       | 662             | 23.3       |
| Ustekinumab                    | 456             | 22.6       | 153             | 18.4       | 609             | 21.4       |
| Secukinumab                    | 225             | 11.2       | 104             | 12.5       | 329             | 11.6       |
| Ixekizumab                     | 153             | 7.6        | 62              | 7.5        | 215             | 7.6        |
| Brodalumab                     | 122             | 6.1        | 57              | 6.9        | 179             | 6.3        |
| Guselkumab                     | 82              | 4.1        | 39              | 4.7        | 121             | 4.3        |
| Biosimilar                     | 0               | 0.0        | 0               | 0.0        | 0               | 0.0        |
| Others                         | 214             | 10.6       | 85              | 10.2       | 299             | 10.5       |

Abbreviations: BB-UVB, broadband ultraviolet B; NB-UVB, narrowband ultraviolet B; NSAIDs, non-steroidal anti-inflammatory drugs; PUVA, psoralen ultraviolet A.
were in the 50–59-year-old group during 2003–2008, and in the 60–69-year-old group during 2009–2012. In the present study, the peak proportion of the patients was in the 60–69-year-old group; however, the peak proportion of the female patients was in the 50–59-year-old group, which was a younger age group than that of the male patients.

Regarding age at onset, the majority of patients were in the 30–39-year-old age group at the onset of the disease (17.4%), followed by the 40–49-year-old (16.5%) and the 20–29-year-old (16.4%) age groups (Figure 2). Most of the male patients had an age at onset of 30–39 years (19.3%), followed by 40–49 years (17.7%) and 20–29 years (17.0%). The distribution of the ages at onset in the male patients was similar to that in a previous survey from 2009 to 2012. Most of the female patients had an age at onset in the 50–59-year-old age group (16.0%), followed by the 20–29-year-old (15.3%) and the 40–49-year-old (14.2%) age groups. The proportion of the female patients, regarding their ages at onset, peaked in two age groups. This trend was
similar to that seen in the previous surveys during 2003–2008 and 2009–2012.5,6

A family history of psoriasis is often observed, and the proportion of patients with a family history varies according to their race. In Japan, Kawada et al.4 reported a rate of 4.4%, Takahashi et al.5 5.8%, and Ito et al.6 6.4%. In the present survey, 4.6% of the patients had a family history of psoriasis (males, 4.3%; females, 5.1%). Bayaraa et al.14 reported a rate of 6.3% from the Fukuoka University Psoriasis Registry, with the female patients having a higher rate of positive family history (8.7%) than the male patients (5.1%). The difference in
the rates of a positive family history between the male and the female patients could explain the differences in the proportion of the male and the female patients in different age groups with respect to the prevalence and the onset of psoriasis.

In the present survey, 50.0% of the cases had past history and co-morbidities (Table 2). The patients' past history and comorbidities included hypertension (42.0%), dyslipidemia (30.0%), diabetes mellitus (23.7%), hyperuricemia (15.1%), cardiovascular disease (6.0%), and
The number of patients who received phototherapy has gradually decreased (Figure 5). PUVA was the most common phototherapy in the previous surveys conducted during 1982–2001 and 2002–2008. However, the number of patients who received PUVA has decreased, and this number has been declining since 2017 (Figure 5). Although NB-UVB was the most common phototherapy during 2013–2018, the number of patients who received NB-UVB has also been decreasing since 2017. Given that the number of patients who received topical therapies has also been declining since 2017, it is possible that systemic therapies have affected the treatment trends of topical and phototherapy.

In systemic therapy, 26.6% of the cases were treated with oral medication, and 18.6% were treated with biologics (Table 4). Cyclosporin had been the most common oral medicine for the treatment of psoriasis. Apremilast was approved for the treatment of psoriasis in December 2016 and has dramatically changed the treatment trend of the oral medication. In 2017, apremilast was the most common oral medicine (Figure 6). In the present survey, the biologics included infliximab (17.6%), adalimumab (23.3%), ustekinumab (21.4%), secukinumab (11.6%), ixekizumab (7.6%), brodalumab (6.3%), and guselkumab (4.3%). Focusing on the treatment trends in biologics, infliximab, adalimumab, and ustekinumab were equally used during 2013–2015 (Figure 7). In 2016, IL-17 inhibitors became the most commonly used biologic, while in 2018, the number of patients who were treated with guselkumab became the highest. In contrast, the number of patients who were being treated with adalimumab and ustekinumab has decreased. Secukinumab, ixekizumab, brodalumab, and guselkumab had shown superior efficacy compared to adalimumab or ustekinumab. These data may affect the therapeutic choices in the clinic setting.

Several limitations of this study are as follows. First, this study was retrospective. Second, this study does not cover all Japanese psoriasis patients. Third, although this study included all types of psoriasis, patients with psoriatic arthritis and generalized pustular psoriasis were not registered during 2017–2018. This is because the JSPR has collected the data about psoriatic arthritis and generalized pustular psoriasis by other questionnaires since 2017.

The present survey evaluated the data from the annual epidemiological surveys of the patients with psoriasis from 2013 to 2018. The results will provide significant information regarding the recent perspective of psoriasis in the Japanese Society, and especially focus on the treatment trends after the introduction of the newly available treatment options.

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**CONFLICT OF INTEREST**

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REFERENCES

1. Nestle FO, Kaplan DH, Barker J. Psoriasis. N Engl J Med. 2009;361:496–509. https://doi.org/10.1056/NEJMra0804595

2. Boehncke WH, Schon MP. Psoriasis. Lancet. 2015;386:983–94. https://doi.org/10.1016/S0140-6736(14)61909-7

3. Kamiya K, Kishimoto M, Sugai J, Komine M, Ohkutsu M. Risk factors for the development of psoriasis. Int J Mol Sci. 2019;20:4347. https://doi.org/10.3390/ijms20184347

4. Kawada A, Tezuka T, Nakamizo Y, Kimura H, Nakagawa H, Ohkido M, et al. A survey of psoriasis patients in Japan from 1982 to 2001. J Dermatol Sci. 2003;31:59–64. https://doi.org/10.1016/s0923-1812(03)00142-1

5. Takahashi H, Nakamura K, Kaneko F, Nakagawa H, Iizuka H. Analysis of psoriasis patients registered with the Japanese Society for Psoriasis Research from 2002–2008. J Dermatol. 2011;38:1125–9. https://doi.org/10.1111/j.1436-8138.2010.01145.x

6. Ito T, Takahashi H, Kawada A, Izuka H, Nakagawa H. Epidemiological survey from 2009 to 2012 of psoriatic patients in Japanese Society for Psoriasis Research. J Dermatol. 2018;45:293–301. https://doi.org/10.1111/1346-8138.14105

7. Kubota K, Kamijima Y, Sato T, Ooba N, Koide D, Iizuka H, et al. Epidemiology of psoriasis and palmoplantar pustulosis: a nationwide study using the Japanese national claims database. BMJ Open. 2015;5:e006450. https://doi.org/10.1136/bmjopen-2014-006450

8. Ogawa E, Okuyama R, Seki T, Kobayashi A, Oiso N, Muto M, et al. Epidemiological survey of patients with psoriasis in Matsumoto city, Nagano Prefecture, Japan. J Dermatol. 2018;45:314–7. https://doi.org/10.1111/1346-8138.14101

9. Chang YT, Chen TJ, Chen YC, Chen YJ, Huang YL, et al. Analysis of psoriasis patients registered with the Japanese Society for Psoriasis Research. J Dermatol. 2015;31:59–64. https://doi.org/10.1016/j.jad.2014.10.013

10. Rachakonda TD, Dhillon JS, Florek AG, Armstrong AW. Effect of tonsillectomy on psoriasis: a systematic review. J Am Acad Dermatol. 2015;72:261–75. https://doi.org/10.1016/j.jaad.2014.10.013

11. Hjuler KF, Iversen L, Rasmussen MK, Kofod K, Skov L, Zachariae C. Localization of treatment-resistant areas in patients with psoriasis on biologics. Br J Dermatol. 2019;181:332–7. https://doi.org/10.1111/bjd.17689

12. Thaci D, Blauvelt A, Reich K, Tsai TF, Vanaclocha F, Kingo K, et al. Secukinumab is superior to ustekinumab in clearing skin of subjects with moderate to severe plaque psoriasis: CLEAR, a randomized controlled trial. J Am Acad Dermatol. 2015;73:400–9. https://doi.org/10.1016/j.jaad.2015.05.013

13. Blauvelt A, Reich K, Tsai TF, Tylting S, Vanaclocha F, Kingo K, et al. Secukinumab is superior to ustekinumab in clearing skin of subjects with moderate to severe plaque psoriasis up to 1 year: results from the CLEAR study. J Am Acad Dermatol. 2017;76:60–9. https://doi.org/10.1016/j.jaad.2016.08.008

14. Ding X, Wang T, Shen Y, Wang X, Zhou C, Tian S, et al. Prevalence of psoriasis and palmoplantar pustulosis: a nationwide study using the Japanese national claims database. J Med J Malaysia. 2018;2018:4371471. https://doi.org/10.1155/2018/4371471

15. Proctor E, Cawthorne M. Psoriasis: an overview of the literature. J Eur Acad Dermatol Venereol. 2009;23:120–123. https://doi.org/10.1111/j.1468-3083.2008.03050.x

16. Guidelli GM, Fioravanti A, Rubegni P, Fuci L. Induced psoriasis after rituximab therapy for rheumatoid arthritis: a case report and review of the literature. Rheumatol Int. 2013;33:2927–30. https://doi.org/10.1007/s00296-012-2581-3

17. Telfer NR, Chalmers RJ, Whale K, Colman G. The role of streptococcal infection in the initiation of guttate psoriasis. Arch Dermatol. 1992;128:39–42.
disease-modifying antirheumatic drug: final results by week 52. Ann Rheum Dis. 2020;79:1310–9. https://doi.org/10.1136/annrheumdis-2020-217372

31. Lebwohl M, Strober B, Menter A, Gordon K, Weglowska J, Puig L, et al. Phase 3 studies comparing brodalumab with ustekinumab in psoriasis. N Engl J Med. 2015;373:1318–28. https://doi.org/10.1056/NEJMoa1503824

32. Blauvelt A, Papp KA, Griffiths CE, Randazzo B, Wasfi Y, Shen Y-K, et al. Efficacy and safety of guselkumab, an anti-interleukin-23 monoclonal antibody, compared with adalimumab for the continuous treatment of patients with moderate to severe psoriasis: results from the phase III, double-blinded, placebo- and active comparator-controlled VOYAGE 1 trial. J Am Acad Dermatol. 2017;76:405–17. https://doi.org/10.1016/j.jaad.2016.11.041

33. Reich K, Armstrong AW, Foley P, Song M, Wasfi Y, Randazzo B, et al. Efficacy and safety of guselkumab, an anti-interleukin-23 monoclonal antibody, compared with adalimumab for the treatment of patients with moderate to severe psoriasis with randomized withdrawal and retreatment: results from the phase III, double-blind, placebo- and active comparator-controlled VOYAGE 2 trial. J Am Acad Dermatol. 2017;76:418–31. https://doi.org/10.1016/j.jaad.2016.11.042

34. Langley RG, Tsai TF, Flavin S, Song M, Randazzo B, Wasfi Y, et al. Efficacy and safety of guselkumab in patients with psoriasis who have an inadequate response to ustekinumab: results of the randomized, double-blind, phase III NAVIGATE trial. Br J Dermatol. 2018;178:114–23. https://doi.org/10.1111/bjd.15750

SUPPORTING INFORMATION
Additional supporting information may be found online in the Supporting Information section.

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