Psoriasis: Targets and Therapy

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Persistence and Long-Term Disease Control of Interleukin-17 Inhibitors and Interleukin-23 Inhibitors in Patients with Psoriasis: A Nationwide Cohort Study in Japan

Youran Xu[1], Tong Li[1], Chia-Ling Chang[2], Yongjing Zhang[1], Junya Masuda[3], Grace Hui-Min Wu[4], Bryan Wahking[2], Shinichi Imafuku[5], Hong Qiu[6]

[1]Global Epidemiology, Johnson & Johnson, Beijing, People's Republic of China; [2]Regional Medical Affairs Asia Pacific, Johnson & Johnson, Singapore, Singapore; [3]Medical Affairs, Janssen Pharmaceutical Companies of Johnson & Johnson, Tokyo, Japan; [4]Global Epidemiology, Johnson & Johnson, Taipei, Taiwan; [5]Department of Dermatology, Faculty of Medicine, Fukuoka University, Fukuoka, Japan; [6]Global Epidemiology, Johnson & Johnson, Titusville, NJ, USA

Correspondence: Hong Qiu, Global Epidemiology, Office of the Chief Medical Officer, Johnson & Johnson, 1125 Trenton-Harbourton Road, Titusville, NJ, 08560, USA, Email HQiu@its.jnj.com; Shinichi Imafuku, Department of Dermatology, Faculty of Medicine, Fukuoka University, 7-45-1, Nanakuma, Fukuoka, 810-0180, Japan, Email dermatologist@mac.com

Introduction: Interleukin-17 inhibitors (IL-17i) and interleukin-23 inhibitors (IL-23i) are advanced therapeutic options for moderate-to-severe psoriasis. In real-world settings, biologic persistence is commonly used as a proxy for effectiveness and safety, and a treatment-free status following biologic discontinuation may provide insights into disease remission. This study aimed to assess persistence and treatment-free status for IL-17i versus IL-23i among biologic-naïve patients with psoriasis in Japan.

Patients and Methods: This retrospective cohort study analyzed data from the Japanese Medical Data Vision database from 01 January 2015 to 31 December 2022. Patients diagnosed with psoriasis who initiated IL-17i or IL-23i during this study period were included. Persistence of the index biologic and post-discontinuation treatment-free status were assessed using Kaplan-Meier methodology. Propensity score methods with inverse probability of treatment weighting and matching were employed to control potential confounding between treatment cohorts.

Results: There were 1,751 and 1,721 patients included in the IL-17i cohort and IL-23i cohort, respectively. Persistence rates for IL-17i were 55.7% [95% CI 53.2–58.1%] at the first year and 21.5% [95% CI 18.9–24.2%] at the fourth year, versus 77.7% [95% CI 75.4–79.8%] and 47.8% [95% CI 42.2–53.2%], respectively, for IL-23i. The risk of discontinuation of IL-23i was half that of IL-17i (adjusted hazard ratio [aHR]=0.49 [95% CI 0.44–0.54]). After discontinuation, 19.2% [95% CI 16.1–22.4%] and 31.5% [95% CI 27.8–41.2%] of patients in the IL-17i and IL-23i cohorts, respectively, remained treatment-free for at least 1 year. Patients treated with IL-23i had a lower risk for resuming systemic therapy after biologic discontinuation (aHR=0.57 [95% CI 0.49–0.67]).

Conclusion: IL-23i was associated with longer persistence and a longer post-discontinuation treatment-free period than IL-17i in patients with psoriasis. These findings may provide actionable insights for healthcare providers and patients as they develop treatment strategies. Future research integrating comprehensive clinical data is warranted to evaluate different treatment strategies, thereby informing clinical decision-making.

Keywords: plaque psoriasis, persistence, treatment-free, interleukin-17 inhibitor, interleukin-23 inhibitor, real-world evidence

Introduction

Psoriasis is a chronic, immune-mediated inflammatory skin disease, affecting approximately 2% of the global population and 0.34% of the Japanese population.[1,2] The interleukin (IL)-23/IL-17 immune axis plays a central role in the immunopathogenesis of psoriasis, with IL-23 serving as a pivotal upstream regulator of IL-17.[3,4] Biologics that selectively block IL-23 or IL-17A provide superior efficacy compared with the earlier class of biologics for the treatment

https://doi.org/10.2147/PTT.S565823
Received: 6 September 2025
Accepted: 16 January 2026
Published: 11 February 2026

of moderate-to-severe psoriasis.[3,5–7] IL-17 inhibitors (IL-17i) typically exhibit a rapid onset of action, whereas IL-23 inhibitors (IL-23i) tend to provide more durable clinical benefit with more favorable safety profile.[4,5,8]

IL-17i and IL-23i were first approved in Japan in 2015 and 2018, respectively, and both are reimbursed nationwide under the National Health Insurance.[9] For plaque psoriasis, biologics are generally indicated for patients with body surface area (BSA)≥10% and psoriasis area and severity index (PASI) ≥ 12, comparable with globally accepted criteria for moderate-to-severe psoriasis.[10,11] Biologics are prescribed at designated medical institutions, and ongoing follow-up with regular monitoring of efficacy and safety is required after treatment initiation.

Psoriasis requires long-term treatment and ongoing management. Biologics frequently achieve satisfactory disease control, but their efficacy may decline over time. Loss of response and safety concerns are common reasons for treatment discontinuation.[11–14] Persistence is defined as the duration of continuous exposure to a biologic from initiation to discontinuation.[15,16] In real-world studies, persistence is widely used as a proxy endpoint for effectiveness and safety, particularly in analyses of claims data that typically lack clinical measures such as PASI.[17–21] Furthermore, treatment patterns after discontinuation may provide indirect evidence of disease control achieved with the prior biologic. Immediate switching to another biologic often indicates failure of the index therapy, whereas a sustained treatment-free status is typically associated with clinical remission.[9,19,22]

Previous studies have generally reported longer persistence with IL-23i compared to other biologic classes.[16,19,22,23] However, real-world evidence from Asian populations remains relatively limited, with existing studies often having short follow-up or lacking adjustment for potential confounding.[24,25] To address this evidence gap, we conducted a retrospective cohort study using nationwide claims data. The study evaluated treatment persistence and post-discontinuation treatment patterns in patients with psoriasis treated with IL-17i versus IL-23i in real-world clinical practice in Japan.

Materials and Methods

Study Design and Database

This retrospective cohort study included patients with psoriasis who newly initiated treatment with an IL-17i (secukinumab/SEC, ixekizumab/IXE, brodalumab/BRO and bimekizumab/BIM) or an IL-23i (gusulkumab/GUS, risankizumab/RIS and tildrakizumab/TIL). Data collection began at each class's market launch (2015 for IL-17i and 2018 for IL-23i) and continued through 31 December 2022, yielding maximum observation periods of up to 8 years for IL-17i and 5 years for IL-23i. The first biologic prescribed to each patient was designated as the index biologic, and the date of its initial prescription was defined as the index date. Patients were followed from the index date until the last available records no later than 31 December 2022.

The Medical Data Vision (MDV) database, one of the largest medical databases in Japan, was the data source for this study. MDV contains hospital-based claims data from over 550 hospitals and covers approximately 54 million patients across the country.[26] The study was conducted in accordance with the Japanese Ethical Guidelines for Medical and Biological Research Involving Human Subjects and the Declaration of Helsinki. The requirement for informed consent was waived as all personal and identifying data were anonymized in the study database.

Participants

Patients diagnosed with plaque psoriasis (International Classification of Disease version 9 [ICD-9] code 696.1x and 696.8x, and ICD-10 codes L40.0, L40.8, and L40.9) who initiated the biologics of interest between 01 January 2015 and 31 December 2022 were included. At least one psoriasis diagnosis during the 1-year baseline period prior to the index date was required. Exclusion criteria included age <18 years at the index date and a diagnosis at baseline of other conditions that can be treated with biologics, including rheumatoid arthritis, ankylosing spondylitis, juvenile idiopathic arthritis, Crohn's disease, ulcerative colitis, non-infectious uveitis, and hidradenitis suppurativa. A 1-year washout of biologic exposure prior to the index date was required. Each patient was considered in the study population only once. Patients were grouped into either the IL-17i cohort or IL-23i cohort based on the index biologic. Persistence of the index

biologic was evaluated for all patients. Post-discontinuation treatment patterns were analyzed for subsets of patients who discontinued their index biologic.

Study Outcomes

Persistence of the Index Biologic

Persistence was defined as the duration of continuous exposure to the index biologic from initiation to discontinuation. Discontinuation was determined through three steps. First, days of supply for each index biologic were identified based on the maintenance dosing interval recommended by the label (BRO 2 weeks, SEC/IXE/BIM 4 weeks, GUS 8 weeks, RIS/TIL 12 weeks). Second, prescription dates were extracted from the claims data. For a small number of prescriptions that included multiple doses, the number of administrations and the corresponding administration dates were inferred from the total dose and the per-administration dose. Third, discontinuation was defined as a prescription gap, which is the interval between two consecutive prescriptions or the interval between the last prescription and the study end date (31 December 2022), exceeding a predefined threshold.[15,16] In our study, the maximum allowed prescription gap in the primary analyses was days of supply plus one maintenance dosing interval. The sensitivity analyses employed two alternative definitions of the maximum allowed prescription gap: (1) days of supply plus two maintenance dosing intervals and (2) days of supply plus fixed 90 days. (Figure S1a).

Bio-Switch and Treatment-Free Status

After discontinuation of the index biologic, we continued to assess the subsequent treatment patterns to provide more insights into disease control. Bio-switch was defined as initiating a subsequent biologic before the end of the index biologic's prescription gap (Figure S1b). The duration of the treatment-free period was defined as the interval between the discontinuation date and the first occurrence of any systemic therapy (biologic or non-biologic) for psoriasis.[19] Patients who were receiving concomitant systemic therapy at the discontinuation date were excluded from the treatment-free analysis.

Control of Bias

To compare the persistence of IL-17i versus IL-23i, propensity scores (PS) were generated using a logistic regression model incorporating covariates that were considered as potential confounders based on prior knowledge, including baseline demographic characteristics (age and sex), comorbid conditions (Charlson comorbidity index [CCI], psoriatic arthritis [PsA] and depression), year of biologic initiation, history of topical and nonbiologic systemic treatments for psoriasis, treating hospital size, and the duration of psoriasis disease. PS-based inverse probability of treatment weighting (IPTW) methods and PS-based matching were employed to balance potential confounders between cohorts. The comparability of groups was assessed using standardized mean differences (SMD), where a SMD of <10% indicated well-balanced characteristics.

To compare treatment-free status, new PS were established based on patient characteristics during a newly defined baseline period of 12 months prior to the discontinuation date, and both PS-IPTW and PS-matching methods were applied. An SMD of <10% indicated well-balanced characteristics.

Statistical Analysis

Categorical variables were described with counts and percentages, and continuous variables were described with means and standard deviations (SD) and medians with first and third quartiles (Q1-Q3). Persistence was assessed by Kaplan-Meier (KM) methodology from the index date to discontinuation. Patients without discontinuation events were censored at the last available record (no later than 31 December 2022). The median persistence time (when ≥50% of patients remained persistent, if reached) and the probability of persistence at each year following treatment initiation were reported. Stratified analyses of persistence were performed based on age (<50 or ≥50 years), year of biologic initiation (before or after IL-23i launch in 2018), and baseline PsA status. The proportion of patients who underwent bio-switch was reported. Among the patients without bio-switch, the duration of the treatment-free period was estimated by KM methodology from the discontinuation date to the first consumption of any systemic therapy for psoriasis. Patients

without post-discontinuation systemic therapy were censored at the last available record (no later than 31 December 2022).

In the IPTW analyses, inverse-probability-of-treatment weights were estimated and applied in weighted Cox proportional hazard models to compare the risks of discontinuation (persistence analysis) and resumption of systemic therapy (treatment-free analysis). Results were presented as hazard ratios (HR) with 95% confidence intervals (CI). In the PS-matching analyses, patients were matched 1:1 without replacement using a caliper width of 0.2 times the pooled standard deviation of the propensity-score logit. Cox models were then fitted in the matched samples to estimate HR (95% CI) for discontinuation and for post-discontinuation systemic therapy. PsA was considered as a potential effect modifier for persistence.[21] Cox models on persistence including an interaction term between the index biologic and PsA status were fitted to report stratum-specific HRs. Sensitivity analyses of treatment-free status were conducted in a subset of patients with long-term persistence (ie, persistence ≥6 months) of the index biologic.

Data management and analyses were performed using SAS 9.4 (SAS Institute Inc., NC, USA).

Results

Participants and Baseline Characteristics

This study included 1,751 patients in the IL-17i cohort (SEC n=919, IXE n=485, BRO n=319 and BIM n=28), and 1,721 patients in the IL-23i cohort (GUS n=828, RIS n=742 and TIL n=151) (Figure 1). In the IL-17i and IL-23i cohorts, 67.7% and 64.1% of patients were male, with median ages of 55 [Q1-Q3: 45–67] and 58 [Q1-Q3: 48–71] years, respectively. Approximately 45% of patients in both cohorts had received non-biologic systemic treatments for psoriasis during the baseline period, and 9.5% had been treated with phototherapy. A higher proportion of patients in the IL-17i cohort (21.1%) had comorbid PsA at baseline compared to the IL-23i cohort (11.7%). The distribution of other comorbidities was generally similar across cohorts, with both exhibiting a median CCI of 0 [Q1-Q3: 0–1] (Table 1).

Persistence

Original Population

The IL-17i cohort exhibited a 1-year persistence rate of 55.7% [95% CI 53.2–58.1%], which declined to 21.5% [95% CI 18.9–24.2%] at year 4. The 1-year persistence rate in IL-23i cohort was 77.7% [95% CI 75.4–79.8%] and decreased to 47.8% [95% CI 42.2–53.2%] at year 4 (Figure 2). Median persistence durations were 1.3 years for the IL-17i cohort and 3.9 years for the IL-23i cohort. Persistence patterns for IL-17i remained similar before and after the launch of IL-23i in 2018 (Figure 3a). When stratified by age, higher persistence with IL-23i than IL-17i was observed in both the <50 and ≥50-year age groups (Figure 3b). When stratified by baseline PsA status, persistence trends differed between cohorts across PsA strata, indicating that PsA may act as an effect modifier of the association between biologics and persistence (Figure 3c).

Balanced Populations

After PS-IPTW, data were derived for 1,750 and 1,735 individuals in the IL-17i and IL-23i cohorts, respectively, with all SMD < 10% (Table S1), indicating good covariate balance. KM persistence curves differed significantly between the weighted IL-17i and IL-23i cohorts (Figure S2a), and the adjusted hazard ratio (aHR) for discontinuation was 0.49 (95% CI 0.44–0.54) for IL-23i versus IL-17i (Figure 4). When the interaction term of baseline PsA and biologic class was included, the stratum-specific aHRs was 0.74 (95% CI 0.58–0.94) in the PsA subgroup and 0.44 (95% CI 0.39–0.50) in the non-PsA subgroup (Figure 4). In the PS-matching analysis, 1,141 individuals were matched in each cohort with all SMD <10% (Table S1), and the adjusted KM curves and aHRs were similar to the IPTW results (Figures S2b and 4). Sensitivity analyses using alternative definitions of discontinuation (days of supply plus two maintenance dosing intervals or plus 90 days) produced results that were directionally consistent with the primary analyses (Figures S3a-c and S4a-c).

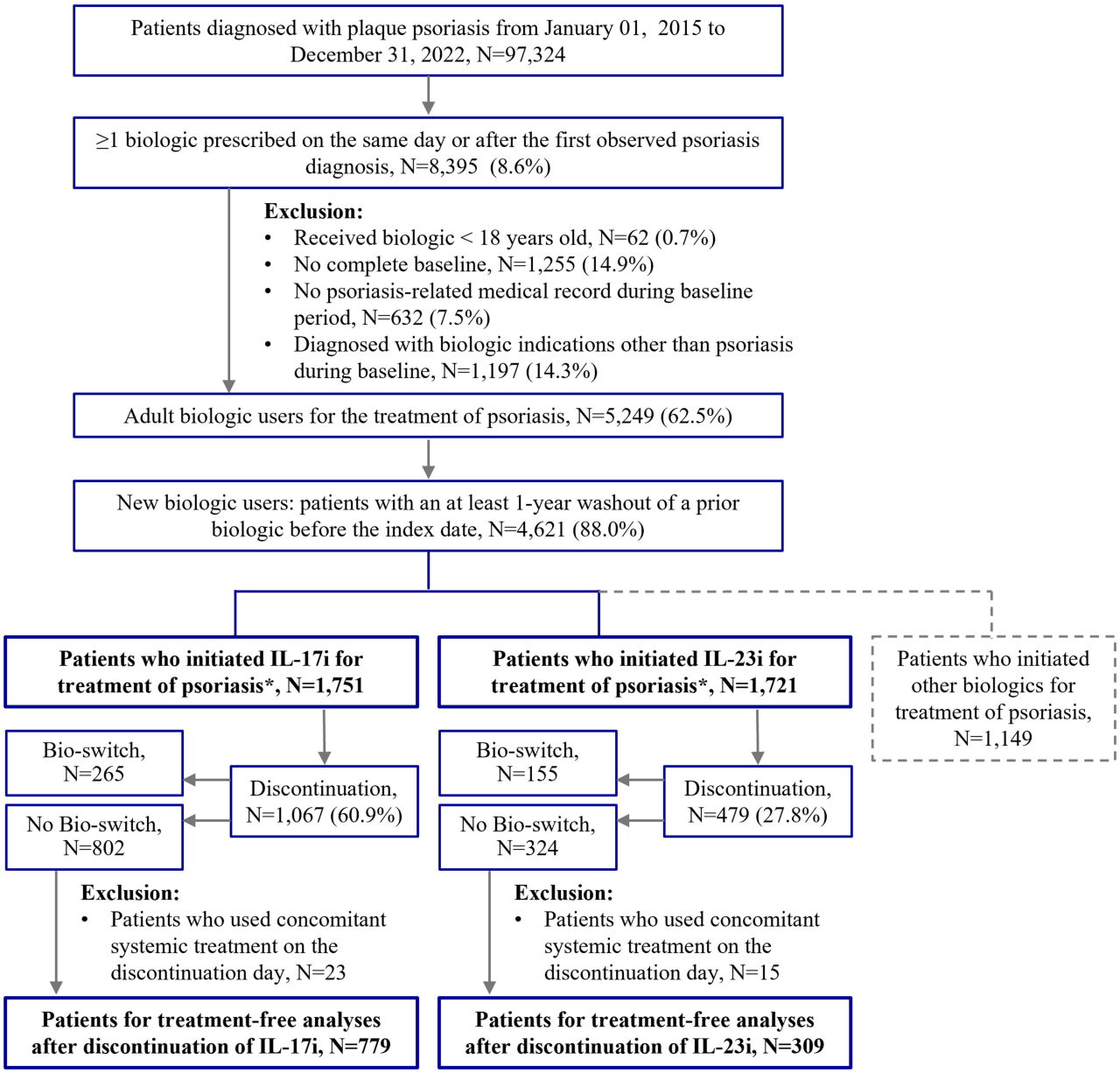


Figure 1 Flowchart of participant selection. *Patients for persistence analysis.
Abbreviations: IL-17i, interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors.

Post-Discontinuation Treatment Patterns

Original Population

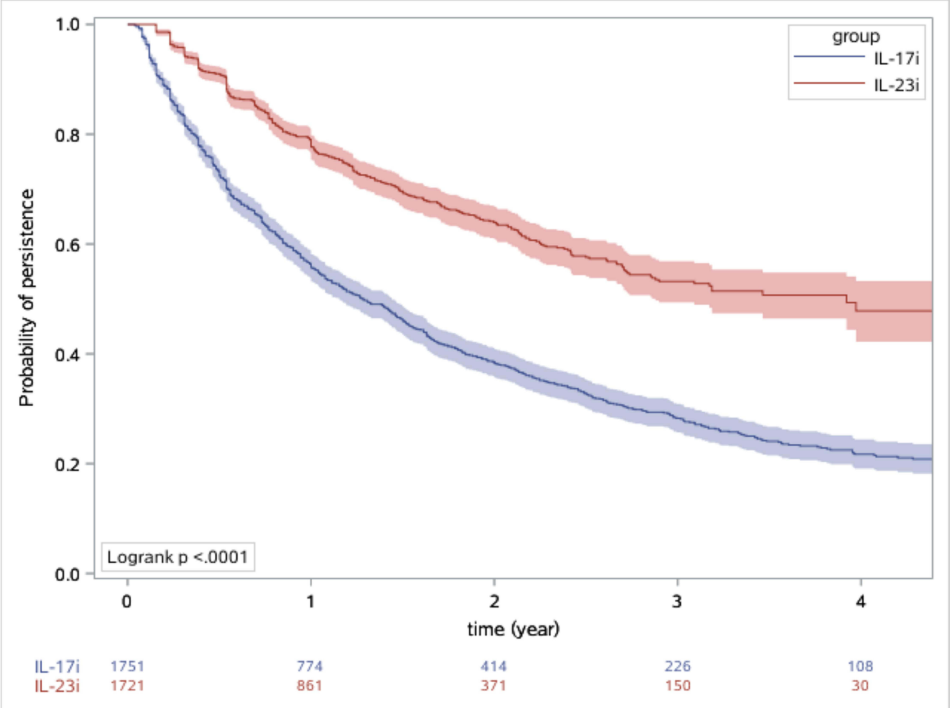
Among the 1,067 patients who discontinued their index IL-17i, 265 switched to another biologic shortly after discontinuation, representing 15.1% of the baseline IL-17i cohort. In the IL-23i cohort, 479 discontinued the index IL-23i and 155 underwent a bio-switch, representing 9.0% of the baseline IL-23i cohort. The remaining patients eligible for the treatment-free analysis numbered 779 and 309 in IL-17i and IL-23i cohort, respectively (Figure 1). The IL-17i cohort was younger than the IL-23i cohort with median ages of 57 [Q1-Q3: 45–70] vs 62 [Q1-Q3: 49–73] years. The IL-17i cohort had higher proportions of males (70.2% vs 62.8%) and baseline PsA cases (22.3% vs 10.7%) (Table 2). The 1-year treatment-free rates were 19.2% [95% CI 16.1–22.4%] for IL-17i cohort and 34.5% [95% CI 27.8–41.2%] for IL-23i cohort (Figure 5).

https://doi.org/10.2147/PTT.S565823

Table 1 Baseline Characteristics of Patients Receiving Interleukin-17 Inhibitors and Interleukin-23 Inhibitors for the Persistence Analysis (Original Population)

	IL-17i		IL-23i	
Total number, n	1751		1721	
Sex, n (%)				
Male	1186	67.7%	1103	64.1%
Female	565	32.3%	618	35.9%
Age at index, years				
Means, SD	55	15	58	15
Median, Q1-Q3	55	45-67	58	48-71
Time of biologic therapy initiation, n (%)				
2015	26	1.5%	–	–
2016	100	5.7%	–	–
2017	219	12.5%	–	–
2018	286	16.3%	90	5.2%
2019	342	19.5%	323	18.8%
2020	258	14.7%	336	19.5%
2021	261	14.9%	490	28.5%
2022	259	14.8%	482	28.0%
Medical history during baseline, n (%)				
Topical therapy	1333	76.1%	1385	80.5%
Systemic therapy	767	43.8%	787	45.7%
Apremilast	392	51.1%	534	67.9%
Ciclosporin	252	64.3%	177	33.1%
Etretinate	160	63.5%	132	74.6%
Methotrexate	97	60.6%	70	53.0%
Others	28	28.9%	17	24.3%
Phototherapy	167	9.5%	160	9.3%
Comorbid conditions during baseline, n (%)				
PsA	370	21.1%	201	11.7%
Hypertension	241	13.8%	234	13.6%
Hyperlipidemia	245	14.0%	220	12.8%
Diabetes (any type)	221	12.6%	198	11.5%
Anxiety	17	1.0%	17	1.0%
Depression	38	2.2%	25	1.5%
Obesity	5	0.3%	10	0.6%
Myocardial infarction	7	0.4%	6	0.3%
Congestive heart failure	25	1.4%	37	2.1%
CCI during baseline				
Means, SD	0.8	1.5	0.8	1.6
Median, Q1-Q3	0	0-1	0	0-1
Hospital size classification, n (%)				
199 beds or less	27	1.5%	23	1.3%
200 to −499 beds	586	33.5%	575	33.4%
500 beds or more	1138	65.0%	1123	65.3%
All-cause hospitalization during baseline, n (%)				
Yes	202	11.5%	158	9.2%
No	1549	88.5%	1563	90.8%
Duration from first observed psoriasis-related claim to the index date, months				
Means, SD	12.9	19.5	16.5	23.0
Median, Q1-Q3	2.5	0.9–17.9	4.3	1.0–24.5

Abbreviations: CCI, Charlson comorbidity index; IL-17i, Interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors; PsA, psoriatic arthritis; Q1–Q3, first and third quartiles; SD, standard deviation.



IL-17 inhibitor	1-year	2-year	3-year	4-year
Probability of persistence	55.7%	38.4%	28.1%	21.5%
95% confidence interval	53.2%-58.1%	35.8%-41.0%	25.6%-30.8%	18.9%-24.2%
IL-23 inhibitor				
Probability of persistence	77.7%	63.8%	52.8%	47.8%
95% confidence interval	75.4%-79.8%	60.7%-66.7%	48.9%-56.5%	42.2%-53.2%

Figure 2 Kaplan-Meier curves for biologic persistence in the original population. Shading indicates 95% CI.
Abbreviations: IL-17i, interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors.

Balanced Populations

After PS-IPTW, data were derived for 779 IL-17i and 309 IL-23i patients, with all SMD <10% (Table S2); KM curves for treatment-free status differed significantly between the weighted cohorts (Figure S5a), and the aHRs for resumption of systemic therapy was 0.57 (95% CI, 0.49–0.67) for IL-23i versus IL-17i (Figure 6). In the PS-matching analyses, 307 patients were matched in each group with all SMDs <10% (Table S2), and the adjusted KM curves and aHRs were similar with the IPTW results (Figures S5b and 6). Sensitivity analyses restricted to subsets of patients with long-term persistence (≥6 months) yielded directionally consistent HR estimates (Figure 6).

Discussion

This retrospective cohort study compared IL-17i with IL-23i in patients with psoriasis using nationwide Japanese claims data and employed PS-IPTW and PS-matching to control for potential confounding. The study covered a long period of observation and included a substantially larger sample than prior real-world studies in Japan. Longer persistence was observed for IL-23i than IL-17i when discontinuation was defined by a prescription gap of days of supply plus one maintenance dosing interval, which was our primary analysis. Sensitivity analyses using two alternative definitions, days of supply plus two maintenance dosing intervals or plus fixed 90 days, yielded results in the same direction. IL-23i was also associated with a longer post-discontinuation treatment-free duration than IL-17i, and this pattern remained in sensitivity analyses restricted to patients with long-term persistence.

Several Japanese studies have evaluated persistence with IL-17i and IL-23i,[14,24,25,27,28] including three analyses using the Japan Medical Data Center (JMDC), which is an employer-based claims database containing data on approximately

https://doi.org/10.2147/PTT.S565823

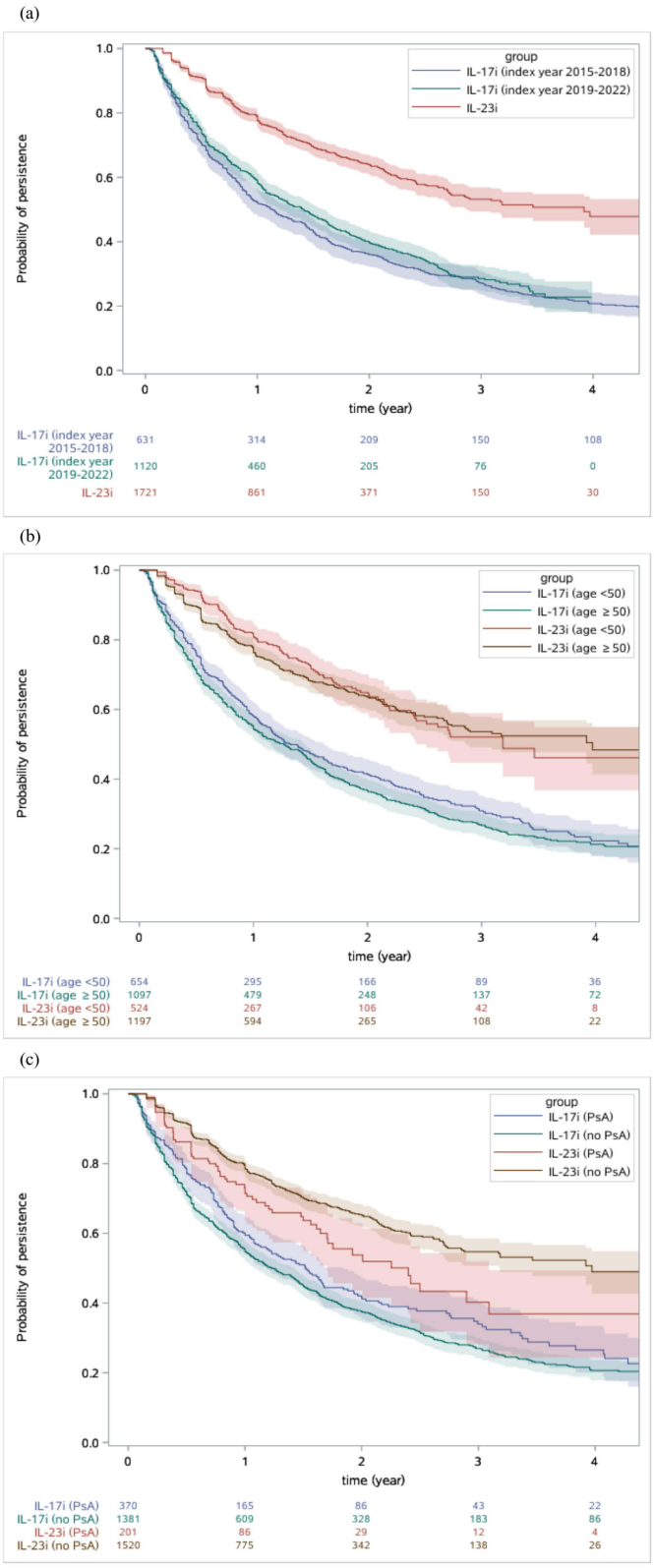


Figure 3 Kaplan-Meier curves for biologic persistence in the original population. (**a**) Stratified by launch year, (**b**) Stratified by age group, (**c**) Stratified by baseline PsA status. Shading indicates 95% CI.
Abbreviations: IL-17i, interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors; PsA, psoriatic arthritis.

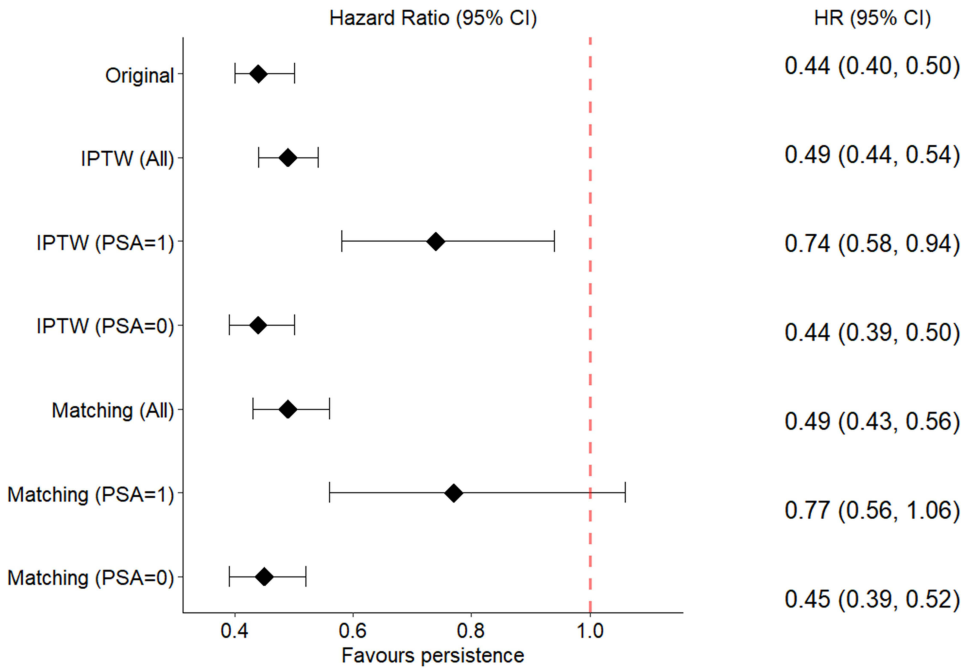


Figure 4 Cox proportional hazard analysis for biologic persistence in patients with psoriasis using different models (IL-23i vs IL-17i).
Abbreviations: IL-17i, interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors; PSA, psoriatic arthritis; IPTW, inverse probability of treatment weighting.

17 million insured individuals.[24,25,27] Across the three studies, the 1-year persistence for IL-17i ranged from 38%-73%, whereas the 1-year persistence for IL-23i remained above 70%. These results are broadly consistent with our study (1-year persistence: IL-17i 56% vs IL-23i 78%), supporting the external validity of our findings within the Japanese context. Studies using the United States claims data reported 1-year persistence of approximately 45–53% for IL-17i and 59–69% for IL-23i.[16,19,22,23] A multicenter cohort study covering 16 dermatology centers in Europe and North America reported 18-month persistence of 80–86% for IL-17i and 91–96% for IL-23i.[29] The heterogeneity across studies may

Table 2 Baseline Characteristics of Patients Receiving Interleukin-17 Inhibitors and Interleukin-23 Inhibitors for the Treatment-Free Analysis (Original Population)

	IL-17i		IL-23i	
Total number, n	779		309	
Sex, n (%)				
Male	547	70.2%	194	62.8%
Female	232	29.8%	115	37.2%
Age at index, years				
Means, SD	56	16	60	16
Median, Q1-Q3	57	45-70	62	49-73
Time of biologic discontinuation, n (%)				
2015	2	0.3%	–	–
2016	26	3.3%	–	–
2017	77	9.9%	–	–
2018	109	14.0%	7	2.3%
2019	143	18.4%	26	8.4%
2020	148	19.0%	103	33.3%
2021	171	22.0%	95	30.7%
2022	103	13.2%	78	25.2%

(*Continued*)

https://doi.org/10.2147/PTT.S565823

Table 2 (Continued).

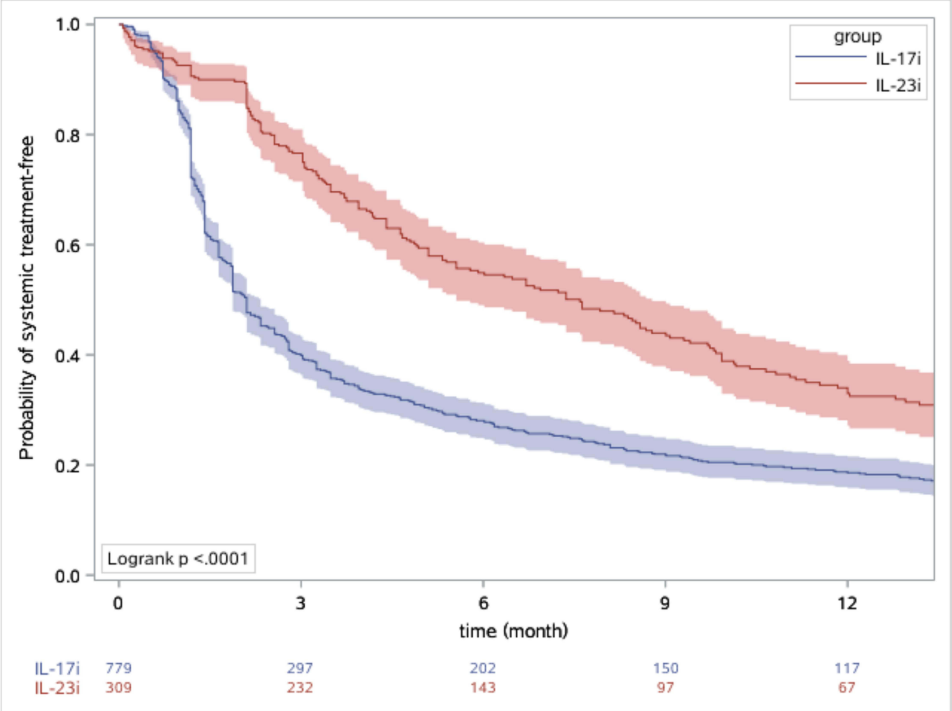
	IL-17i		IL-23i	
Any systemic therapy during new baseline, n (%)				
Yes	230	29.5%	96	31.1%
No	549	70.5%	213	68.9%
Any topical therapy during new baseline, n (%)				
Yes	605	77.7%	249	80.6%
No	174	22.3%	60	19.4%
CCI during new baseline				
Means, SD	1	1.7	1.1	2
Median, Q1-Q3	0	0-1	0	0-1
Other comorbid conditions during new baseline				
PsA, n (%)	174	22.3%	33	10.7%
Depression, n (%)	20	2.6%	12	3.9%
Hospital size classification, n (%)				
199 beds or less	8	1.0%	5	1.6%
200 to 499 beds	293	37.6%	116	37.5%
500 beds or more	478	61.4%	188	60.8%
All-cause hospitalization during new baseline, n (%)				
Yes	114	14.6%	56	18.1%
No	665	85.4%	253	81.9%
Duration from first observed psoriasis-related claim to the discontinuation date, months				
Means, SD	23.4	21.3	25	20.5
Median. Q1-Q3	16.6	6.5–35.5	17.5	9.5–36.5

Abbreviations: CCI, Charlson comorbidity index; IL-17i, Interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors; PsA, psoriatic arthritis; Q1–Q3, first and third quartiles; SD, standard deviation.

reflect differences in healthcare settings, data sources, population characteristics, follow-up duration, and the definitions of persistence and discontinuation.

Biologic therapies for psoriasis generally require continuous treatment, and decisions about discontinuation are made based on comprehensive clinical considerations.[9,18] The most common reason for discontinuation is loss of efficacy.[14,20,21] Yanase et al reported rates of loss of efficacy ranging from 5% to 22% for IL-17i and <5% for IL-23i.[14] Safety concerns also contribute to discontinuation.[30] Although both IL-17i and IL-23i are generally well tolerated in real-world settings, some studies have reported a higher occurrence of adverse events (AEs) during IL-17i than IL-23i therapy.[5,21] From another perspective, patients and physicians may electively discontinue therapy when a satisfactory response, such as PASI-90/100 (clinical clearance) or Dermatology Life Quality Index remission, has been achieved and maintained. To date, there has been no global consensus on the optimal timing of biologic discontinuation.[10,18] Japanese guidelines recommend that discontinuation can be considered after remission has been sustained for 9–12 months.[9]

Multiple factors may explain the longer persistence frequently observed with IL-23i relative to IL-17i. Mechanistically, IL-17 lies downstream of IL-23 in the pathogenic IL-23/IL-17 immune axis. Accordingly, blockade of IL-17 commonly yields a more rapid symptomatic response, whereas IL-23 inhibition, by targeting upstream drivers of Th17 differentiation, may lead to a slower onset but more sustained modification of the pathogenic pathway.[3,4,8] However, agent-specific pharmacokinetics/pharmacodynamics may modify these general patterns.[31] IL-17i are administered at higher doses and with greater frequency than IL-23i, which may also contribute to the higher occurrence of AEs observed with IL-17i.[5] In addition, higher administration frequency can reduce the convenience of treatment and impair adherence, thereby increasing the likelihood of treatment discontinuation.[23] Other non-clinical factors that may affect real-world persistence include accessibility of care, drug availability, cost and reimbursement, patient and clinician preferences, and possible administrative issues, among others.



IL-17 inhibitor	1-year
Probability of treatment-free	19.2%
95% confidence interval	16.1%-22.4%
IL-23 inhibitor	
Probability of treatment-free	34.5%
95% confidence interval	27.8%-41.2%

Figure 5 Kaplan-Meier curves for free from systemic treatment after biologic discontinuation in the original population.
Abbreviations: IL-17i, interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors.

In our study, PsA modified the persistence curves of IL-17i and IL-23i in opposite directions (Figure 3c) and the interaction term was statistically significant ($p<0.05$), indicating that PsA was an effect modifier of persistence.[21] Baseline PsA was present in 21.2% of patients in the IL-17i cohort and 11.7% in the IL-23i cohort. In the IL-17i cohort, patients with PsA showed slightly higher persistence than those without PsA, whereas in the IL-23i cohort persistence tended to be lower among patients with PsA. Multiple studies have demonstrated the preventive effect against joint destruction for IL-17i, and the current Japanese guidelines recommend tumor necrosis factor-α inhibitors and IL-17i as the preferred options for patients with concomitant PsA.[9,32] Although beneficial effects of IL-23i on joint symptoms have been reported in clinical studies, longer follow-up is needed to confirm their effectiveness in joint prevention in real-world settings.[33,34]

Guidelines recommend continued follow-up after biologic discontinuation, and post-discontinuation treatment patterns can provide real-world insights into long-term disease control.[10] In our study, 15% of patients with IL-17i and 9% of patients with IL-23i switched to a subsequent biologic shortly after discontinuation, a pattern commonly interpreted as reflecting inadequate effectiveness or safety concerns with the preceding biologic.[9,35] Analyses using US claims data reported an overall 1-year bio-switch rate of 14%, with the lowest switch rates observed for IL-23i compared with other biologic classes.[36] A chart-review study in England reported a 1-year bio-switch rate of 12%, where all switches were due to ineffectiveness and no patient achieved PASI 75.[37]

In our study, 19.2% of IL-17i patients and 34.5% of IL-23i patients remained free of any systemic therapies of psoriasis at 1 year after biologic discontinuation. Cox models showed that patients in the IL-23i cohort had 40–50% lower hazard of resuming systemic treatment, which has been used as a proxy for disease relapses, compared with the IL-

https://doi.org/10.2147/PTT.S565823

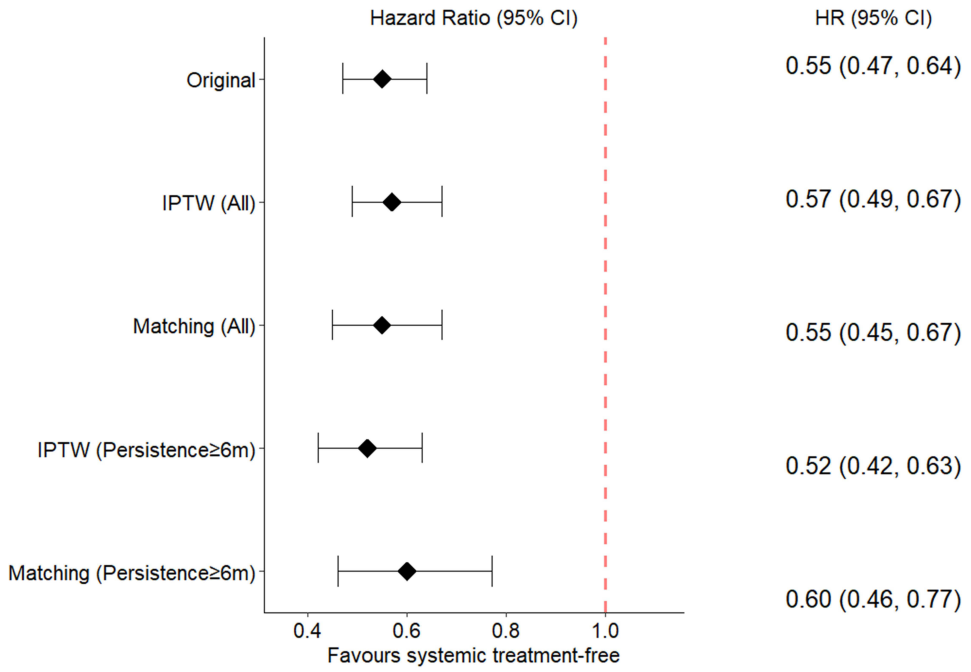


Figure 6 Cox proportional hazard analysis for treatment-free status after biologic discontinuation in patients with psoriasis using different models (IL-23i vs IL-17i).
Abbreviations: IL-17i, interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors; IPTW, inverse probability of treatment weighting.

17i cohort (aHR ranged 0.5 to 0.6), and similar findings were observed in the long-persistence subgroups (persistence > 6 months). A prior review reported that the longest time to relapse was observed with IL-23i compared with other biologics.[31] The relatively shorter time to relapse of IL-17i may reflect its downstream position in the IL-23/IL-17 pathway and the correspondingly shorter duration of effect following IL-17 blockade.[5] A study using US claims data reported 1-year treatment-free rates of approximately 16–18% for IL-17i and 28% for IL-23i, broadly concordant with our findings.[19] Zhdanava et al, used treatment-free status as a proxy for disease remission and found that patients treated with IL-23i were about 30% more likely to achieve remission than those treated with IL-17i.[22] Sustaining a treatment-free status is a desirable objective in real-world psoriasis management. In our study, we cannot exclude that non-clinical factors such as patient preferences, cost, healthcare access, as well as data completeness, may have also influenced the observed results.

Study limitations must be acknowledged. First, claims data capture prescription information which may not accurately reflect actual medication administration. In Japan, IL-23i must be administered in medical institutions, so prescription records are likely to closely reflect actual drug administration. However, IL-17i are allowed to be administered by self-injection, which may lead to over- or underestimation of persistence patterns when they are based on prescription data. Second, claims data lack clinical information such as PASI and AEs, and the underlying reasons for biologic discontinuation and treatment switching are unknown, therefore persistence and treatment-free status are considered as proxy measures and not direct indicators of disease control. Third, although the measured covariates were balanced by PS-related methods, residual confounding from unmeasured factors may bias the estimated associations. Fourth, the MDV is a hospital-based database and follow-up may be interrupted if patients switch hospitals. Even so, Japan's strict biologic management policies typically ensure that patients consistently attend the same facility for biologic therapy, mitigating this limitation.[9]

Conclusion

In this retrospective cohort study, IL-23i was associated with longer treatment persistence and a longer post-discontinuation treatment-free period compared with IL-17i in patients with psoriasis. These findings may provide actionable insights for healthcare providers and patients as they develop treatment strategies and plan the long-term

management of psoriasis. Although PS-IPTW and PS-matching were employed to adjust for covariates, the limited clinical information available in claims data may leave residual confounding. Future research integrating comprehensive clinical data (such as PASI) is warranted to compare different biologic treatment strategies and assess their impacts on disease control, thereby informing clinical decision-making.

Abbreviations

aHR, adjusted hazard ratio; BIM, bimekizumab; BRO, brodalumab; CCI, Charlson comorbidity index; CI, confidence interval; GUS, gusulkumab; ICD, International Classification of Diseases; IL-17i, Interleukin-17 inhibitors; IL-23i, interleukin-23 inhibitors; IPTW, inverse probability of treatment weighting; IXE, ixekizumab; KM, Kaplan-Meier; MDV, Medical Data Vision; PASI, Psoriasis Area and Severity Index; PS, propensity scores; PsA, psoriatic arthritis; Q1–Q3, first and third quartiles; RIS, Risankizumab; SEC, secukinumab; SD, standard deviation; SMD, standardized mean differences TIL, tildrakizumab.

Data Sharing Statement

The data that support the findings of this study are available from Medical Data Vision Co., Ltd. under license for this study, and are not publicly available. However, data are available from the corresponding author Dr. Hong Qiu upon reasonable request and with permission of Medical Data Vision Co., Ltd.

Ethics Approval and Informed Consent

The study was conducted in accordance with the Japanese Ethical Guidelines for Medical and Biological Research Involving Human Subjects and the Declaration of Helsinki. The requirement for informed consent was waived as all personal and identifying data were anonymized in the study database.

Acknowledgments

The authors thank Dr. Steven Fakharzadeh and Dr. Robert Suruki for critical review and valuable comments on interpreting the study results.

Author Contributions

All authors made a significant contribution to the work reported, whether in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

The study was supported by Johnson & Johnson.

Disclosure

Youran Xu, Tong Li, and Grace Hui-min Wu are employees of Johnson&Johnson. Chia-Ling Chang, Yongjing Zhang, Junya Masuda, Bryan Wahking and Hong Qiu are employees and hold stock/shares of Johnson&Johnson. Shinichi Imafuku reports personal fees from Janssen, personal fees from Abbvie, personal fees from Amgen, personal fees from KyowaKirin, personal fees from Sunpharma, personal fees from Takeda, personal fees from Eli Lilly, personal fees from Novartis, personal fees from Bristol-Myers Squibb, personal fees from Maruho, personal fees from UCB, outside the submitted work. The authors report no other conflicts of interest in this work.

References

1. Nestle FO, Kaplan DH, Barker J. Psoriasis. *N Engl J Med*. 2009;361(5):496–509. doi:10.1177/1461444810365020
2. Kubota K, Kamijima Y, Sato T, et al. Epidemiology of psoriasis and palmoplantar pustulosis: a nationwide study using the Japanese national claims database. *BMJ Open*. 2015;5(1). doi:10.1136/bmjopen-2014-006450

3. Menter A, Krueger GG, Paek SY, Kivelevitch D, Adamopoulos IE, Langley RG. Interleukin-17 and interleukin-23: a narrative review of mechanisms of action in psoriasis and associated comorbidities. *Dermatol Ther*. 2021;11(2):385–400. doi:10.1007/s13555-021-00483-2
4. Erichsen C, Jensen P, Kofoed K. Biologic therapies targeting the IL-23/IL-17 immune axis for the treatment of moderate-to-severe plaque psoriasis: a systematic review and meta-analysis. *JEADV*. 2020;34(1):30–38. doi:10.1111/jdv.15879
5. Cui L, Chen R, Subedi S, et al. Efficacy and safety of biologics targeting IL-17 and IL-23 in the treatment of moderate-to-severe plaque psoriasis: a systematic review and meta-analysis of randomized controlled trials. *Int Immunopharmacol*. 2018;62:46–58. doi:10.1016/j.intimp.2018.06.020
6. Ghoreschi K, Balato A, Enerbäck C, Sabat R. Therapeutics therapeutics targeting the IL-23 and IL-17 pathway in psoriasis. *Lancet*. 2021;397 (10275):754–766. doi:10.1016/S0140-6736(21)00184-7
7. Sbidian E, Chaimani A, Afach S, et al. Systemic pharmacological treatments for chronic plaque psoriasis: a network meta-analysis (Review). *Cochrane Database Syst Rev*. 2020;9(1):1. doi:10.1002/14651858.CD011535.pub3
8. Egeberg A, Andersen YMF, Halling-Overgaard AS, et al. Systematic review on rapidity of onset of action for interleukin-17 and interleukin-23 inhibitors for psoriasis. *JEADV*. 2020;34(1):39–46. doi:10.1111/jdv.15920
9. Saeki H, Mabuchi T, Asahina A, et al. English version of Japanese guidance for use of biologics for psoriasis (the 2022 version). *J Dermatol*. 2023;50(2):e41–e68. doi:10.1111/1346-8138.16691
10. Nast A, Smith C, Spuls PI, et al. EuroGuiDerm guideline on the systemic treatment of psoriasis vulgaris – part 1: treatment and monitoring recommendations. *JEADV*. 2020;34(11):2461–2498. doi:10.1111/jdv.16915
11. Menter A, Strober BE, Kaplan DH, et al. Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with biologics. *J Am Acad Dermatol*. 2019;80(4):1029–1072. doi:10.1016/j.jaad.2018.11.057
12. Lin PT, Wang SH, Chi CC. Drug survival of biologics in treating psoriasis: a meta-analysis of real-world evidence. *Sci Rep*. 2018;8(1). doi:10.1038/s41598-018-34293-y
13. Murage MJ, Tongbram V, Feldman SR, et al. Medication adherence and persistence in patients with rheumatoid arthritis, psoriasis, and psoriatic arthritis: a systematic literature review. *Patient Prefer Adherence*. 2018;12:1483–1503. doi:10.2147/PPA.S167508
14. Yanase T, Tsuruta N, Yamaguchi K, et al. Survival rates of systemic interventions for psoriasis in the Western Japan psoriasis registry: a multicenter retrospective study. *J Dermatol*. 2023;50(6):753–765. doi:10.1111/1346-8138.16737
15. Huang YH, Tang CH, Goh CH, et al. Persistence and adherence to biologics in patients with psoriasis in taiwan: a new biologics user cohort study. *Front Pharmacol*. 2022:13. 10.3389/fphar.2022.880985.
16. Xu C, Teeple A, Wu B, Fitzgerald T, Feldman SR. Drug adherence and persistence of patients with moderate to severe psoriasis treated with biologic medications in a US commercially insured population. *Dermatology*. 2021;238(3):438–447. doi:10.1159/000519176
17. Costanzo A, Malara G, Pelucchi C, et al. Effectiveness end points in real-world studies on biological therapies in psoriasis: systematic review with focus on drug survival. *Dermatology*. 2018;234(1–2):1–12. doi:10.1159/000488586
18. Dao DPD, Pixley JN, Feldman SR. When should systemic biologic therapy for psoriasis be discontinued? *J DermatolTreat*. 2023;34(1). doi:10.1080/09546634.2023.2173516
19. Fitzgerald T, Zhdanava M, Pilon D, et al. Long-term psoriasis control with guselkumab, adalimumab, secukinumab, or ixekizumab in the USA. *Dermatol Ther*. 2023;13(4):1053–1068. doi:10.1007/s13555-023-00910-6
20. Gniadecki R, Bang B, Bryld LE, Iversen L, Lasthein S, Skov L. Comparison of long-term drug survival and safety of biologic agents in patients with psoriasis vulgaris. *Br J Dermatol*. 2015;172(1):244–252. doi:10.1111/bjd.13343
21. Yiu ZZN, Becher G, Kirby B, et al. Drug survival associated with effectiveness and safety of treatment with guselkumab, ixekizumab, secukinumab, ustekinumab, and adalimumab in patients with psoriasis. *JAMA Dermatol*. 2022;158(10):1131–1141. doi:10.1001/jamadermatol.2022.2909
22. Zhdanava M, Fitzgerald T, Pilon D, et al. Comparative analysis of persistence and remission with guselkumab versus secukinumab and ixekizumab in the United States. *J DermatolTreat*. 2024;35(1). doi:10.1080/09546634.2024.2349658
23. Xu C, Teeple A, Wu B, Fitzgerald T, Feldman SR. Treatment adherence and persistence of seven commonly prescribed biologics for moderate to severe psoriasis and psoriatic arthritis in a U.S. commercially insured population. *J Dermatol Treat*. 2022;33(4):2270–2277. doi:10.1080/09546634.2021.1950600
24. Tada Y, Kim H, Spanopoulos D, et al. Treatment patterns, healthcare resource utilization, and costs in patients with moderate-to-severe psoriasis treated with systemic therapy in Japan: a retrospective claims database study. *J Dermatol*. 2022:1106–1117. 10.1111/1346-8138.16543.
25. Tada Y, Soliman AM, Ishii K, et al. Real-World discontinuation and switching patterns for interleukin-inhibitor treatments in patients with moderate-to-severe psoriasis in Japan. *Dermatol Ther*. 2024;14(1):99–114. doi:10.1007/s13555-023-01064-1
26. Medical Data Vision. MDV EBM insight: medication trends ranking in MDV Data (2022). Available from: https://en.mdv.co.jp/ebm/reference/02/#section1. Accessed January 20, 2026.
27. Miyazaki C, Masuda J, Ching PI, Hidehisa T. Factors affecting treatment persistence in japanese patients with psoriasis prescribed biologics: a real - world study using an insurance claim database. *Dermatol Ther*. 2024;14(11):2999–3015. doi:10.1007/s13555-024-01274-1
28. Tada Y, Komine M, Okubo Y, Habiro K, Tsuritani K, Morita A. Treatment patterns of systemic drug use in Japanese patients with plaque psoriasis: a retrospective chart review. *J Dermatol*. 2024;51(2):210–222. doi:10.1111/1346-8138.17038
29. Torres T, Puig L, Vender R, et al. Drug survival of IL-12/23, IL-17 and IL-23 inhibitors for psoriasis treatment: a retrospective multi-country, multicentric cohort study. *Am J Clin Dermatol*. 2021;22(4):567–579. doi:10.1007/s40257-021-00598-4
30. Vegas LP, Penso L, Claudepierre P, Sbidian E. Long-term persistence of first-line biologics for patients with psoriasis and psoriatic arthritis in the French health insurance database. *JAMA Dermatol*. 2022;158(5):513–522. doi:10.1001/jamadermatol.2022.0364
31. Regnault MM, Shourick J, Jendoubi F, Tauber M, Paul C. Time to relapse after discontinuing systemic treatment for psoriasis: a systematic review. *Am J Clin Dermatol*. 2022;23(4):433–447. doi:10.1007/s40257-022-00679-y
32. Nash P, Mcinnes IB, Mease PJ, et al. Secukinumab versus adalimumab for psoriatic arthritis: comparative effectiveness up to 48 weeks using a matching-adjusted indirect comparison. *Rheumatol Ther*. 2018;5(1):99–122. doi:10.1007/s40744-018-0106-6
33. Deodhar A, Helliwell PS, Boehncke WH, et al. Guselkumab in patients with active psoriatic arthritis who were biologic-naive or had previously received TNFα inhibitor treatment (DISCOVER-1): a double-blind, randomised, placebo-controlled Phase 3 trial. *Lancet*. 2020;395 (10230):1115–1125. doi:10.1016/S0140-6736(20)30265-8
34. Mease PJ, Rahman P, Gottlieb AB, et al. Guselkumab in biologic-naive patients with active psoriatic arthritis (DISCOVER-2): a double-blind, randomised, placebo-controlled phase 3 trial. *Lancet*. 2020;395(10230):1126–1136. doi:10.1016/S0140-6736(20)30263-4

35. Marcombes C, Penso L, Weill A, Dray-Spira R, Zureik M, Sbidian E. Persistence of second-line biologics in psoriasis after first-line biologic failure: a nationwide cohort study from the French health insurance database (SNDS). *Br J Dermatol*. 2023;189(5):561–568. doi:10.1093/bjd/ljad248
36. Armstrong AW, Patel M, Li C, Garg V, Mandava MR, Wu JJ. Real-world switching patterns and associated characteristics in patients with psoriasis treated with biologics in the United States. *J DermatolTreat*. 2023;34(1). doi:10.1080/09546634.2023.2200870
37. Khalid JM, Fox KM, Globe G, Maguire A, Chau D. Treatment patterns and therapy effectiveness in psoriasis patients initiating biologic therapy in England. *J DermatolTreat*. 2014;25(1):67–72. doi:10.3109/09546634.2013.768762