



THE ROLE OF SECUKINUMAB IN THE MANAGEMENT OF MODERATE TO SEVERE PSORIASIS: A SYSTEMATIC REVIEW OF EFFICACY AND SAFETY

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ABSTRACT

Psoriasis is a chronic, immune-mediated inflammatory skin disease characterized by erythematous, scaly plaques. In moderate to severe psoriasis, conventional therapies often provide a suboptimal response, making biologic therapies such as secukinumab an important treatment option. Secukinumab is a human IgG1κ monoclonal antibody that targets interleukin-17A (IL-17A). To assess the efficacy and safety of secukinumab in the management of moderate to severe psoriasis. This study is a systematic review based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A literature search was conducted through PubMed, Scopus, the Cochrane Library, ScienceDirect, and Google Scholar through April 2026. Included studies were randomized controlled trials (RCTs) evaluating the efficacy and safety of secukinumab in moderate to severe psoriasis. Efficacy outcomes included the Psoriasis Area and Severity Index (PASI), Investigator Global Assessment (IGA), and Dermatology Life Quality Index (DLQI), while safety outcomes included adverse events and serious adverse events. Seven studies met the inclusion criteria. Overall, secukinumab demonstrated high efficacy in improving the clinical manifestations of psoriasis, with better PASI90 and PASI100 scores compared to comparator biologics such as ustekinumab. Secukinumab also provided a rapid clinical response and improved patients' quality of life. The most frequently reported adverse events included nasopharyngitis, upper respiratory tract infection, headache, and injection site reactions, while serious adverse events were reported in low numbers. Secukinumab is an effective and safe biologic therapy for moderate to severe psoriasis.

Keywords: biologic agents; IL-17A; psoriasis; secukinumab; systematic review

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INTRODUCTION

Psoriasis is a chronic inflammatory skin disease characterized by the appearance of erythematous, scaly plaques that can affect various areas of the body, especially the extensor surfaces, and are often accompanied by pruritus. This disease occurs due to immune system dysregulation that triggers excessive keratinocyte proliferation and chronic inflammation in the skin. The immunological pathways interleukin (IL)-12/23 and IL-17 are known to play a crucial role in the pathogenesis of psoriasis, particularly in moderate to severe plaque psoriasis. Psoriasis not only causes distinctive clinical manifestations, but also significantly impacts patients' quality of life, both physically, psychologically, and socially (Jung et al., 2022)

Psoriasis management includes topical therapy, phototherapy, and conventional systemic therapies such as methotrexate, cyclosporine, and acitretin. These therapies often provide a less than optimal response in moderate to severe cases and can cause side effects that limit long-term use. The development of biologic therapies has been a significant advancement in modern psoriasis management (Chan, 2025).

One widely used biologic therapy is secukinumab, a human IgG1 κ monoclonal antibody that specifically targets interleukin-17A (IL-17A). IL-17A is a key pro-inflammatory cytokine involved in the activation of the inflammatory response and the formation of psoriatic lesions. By inhibiting IL-17A activity, secukinumab can reduce the inflammatory process, thereby improving the clinical manifestations of psoriasis, including the extent and severity of lesions, and reducing symptoms such as pruritus and pain. Secukinumab is administered by subcutaneous injection, with the dose adjusted based on the patient's clinical condition and response to therapy (Fargnoli, 2019).

Several randomized clinical trials have demonstrated high efficacy of secukinumab in achieving clinical improvement in psoriasis, including improvements in Psoriasis Area and Severity Index (PASI) scores and reductions in Physician Global Assessment (PGA). This therapy has also been shown to significantly improve patients' quality of life. In terms of safety, secukinumab generally has a good tolerability profile, with the most common side effects being injection site reactions, headaches, and mild infections. As a biologic agent that modulates the immune system, secukinumab use still requires regular monitoring for the possibility of serious side effects and other immunological responses (Kim et al., 2023).

As the use of secukinumab in clinical practice increases, a comprehensive evaluation of the efficacy and safety of this therapy based on current scientific evidence is needed. This systematic review aims to assess the efficacy and safety of secukinumab in the treatment of moderate to severe plaque psoriasis based on available clinical study results.

METHOD

This study was conducted using a systematic review method, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This systematic review aimed to evaluate the efficacy and safety of secukinumab in the management of moderate to severe psoriasis based on the latest scientific evidence from available clinical studies. The study methodology was developed by adapting several previous randomized controlled trials (RCTs) on the use of secukinumab in moderate to severe psoriasis.

Literature Search Strategy

A systematic literature search was conducted in several electronic databases, including PubMed, Scopus, the Cochrane Library, ScienceDirect, and Google Scholar. Articles were searched for publications published through April 2026. The keywords used were structured based on the Population, Intervention, Comparison, Outcome (PICO) concept, specifically patients with moderate to severe psoriasis receiving secukinumab therapy, with an assessment of the efficacy and safety of the therapy.

The literature search was conducted using combinations of relevant keywords, including “secukinumab” AND “plaque psoriasis” AND “moderate to severe,” “secukinumab” AND “psoriasis” AND “efficacy,” “secukinumab” AND “psoriasis” AND “safety,” “IL-17 inhibitor” AND “moderate to severe psoriasis,” and “secukinumab” AND “PASI” AND “DLQI.” Boolean operators “AND” and “OR” were applied as appropriate to identify relevant articles.

Studies were eligible for inclusion if they involved adult patients diagnosed with moderate-to-severe plaque psoriasis, evaluated secukinumab as the primary intervention, and assessed its efficacy and/or safety. Eligible studies were required to report at least one efficacy outcome, including a $\geq 75\%$, $\geq 90\%$, or 100% improvement in the Psoriasis Area and Severity Index (PASI 75, PASI 90, or PASI 100), Investigator's Global Assessment (IGA), or Dermatology Life Quality Index (DLQI), and/or safety outcomes such as adverse events or serious adverse events. Only randomized controlled trials (RCTs) published in English and available as full-text articles were included.

Studies were excluded if they were review articles, editorials, case reports, case series, cross-sectional studies, cohort studies, case-control studies, letters to the editor, or conference abstracts. In vitro and animal studies were also excluded. Additionally, studies with incomplete data, duplicate or repeated publications, and articles that were not relevant to the objectives of this study were excluded.

Study Selection

All articles obtained from the search results were evaluated in stages through identification, screening, eligibility, and inclusion according to the PRISMA flowchart (Figure 1). Duplicate articles were first removed, followed by screening based on title and abstract. Articles meeting the initial criteria were then evaluated through full-text reading to determine final eligibility based on inclusion and exclusion criteria. The article selection process was conducted independently by two researchers. If there were differences of opinion, discussions were held until a consensus was reached.

Data Extraction

Data from eligible articles were systematically extracted using a pre-designed data extraction form. Information collected included: author name, year of publication, country of study, sample size, secukinumab dose and duration, efficacy outcomes (PASI75, PASI90, PASI100, IGA, DLQI), and safety outcomes in the form of adverse events and serious adverse events.

Study Quality Assessment

Methodological quality assessment of studies was performed using the Critical Appraisal Skills Programme (CASP) checklist and the Cochrane Risk of Bias Tool guidelines for RCTs (Figures 2 and 3). The assessment was conducted to evaluate the methodological validity, risk of bias, and quality of reporting of each included study.

Data analysis

The data obtained were analyzed descriptively and presented in narrative tables. The analysis was conducted by comparing the efficacy and safety of secukinumab based on the clinical outcomes reported in each study. The primary efficacy outcome included PASI (PASI75, PASI90, PASI100) or improvement in the IGA score, or DLQI, while safety outcomes included the incidence of common and serious adverse events. The study results were then synthesized to describe the effectiveness of secukinumab in improving the clinical manifestations of moderate to severe psoriasis and its safety profile in clinical practice.

RESULT

Literature Search Results

A literature search was conducted through several electronic databases, including PubMed, Scopus, ScienceDirect, the Cochrane Library, and Google Scholar, using predetermined keywords. The initial search yielded 2,368 relevant articles on the use of secukinumab in moderate to severe psoriasis. After removing duplicate articles, title and abstract screening was performed based on the study's inclusion and exclusion criteria. Articles meeting the criteria were then evaluated through full-text reading. Based on this selection process, seven studies were eligible for inclusion in this systematic review (Figure 1). All included studies were clinical trials with RCT designs evaluating the efficacy and safety of secukinumab in patients with moderate to severe plaque psoriasis.

Study Characteristics

The characteristics of the included studies are presented in Table 1. The analyzed studies were published between 2015 and 2025 and were mostly multinational studies with varying sample sizes, ranging from 36 to 1,102 patients. The majority of studies used randomized double-blind controlled trials and phase III comparator trials.

All studies involved adult patients with moderate to severe plaque psoriasis who met criteria such as a PASI score ≥ 12 , body surface area (BSA) $\geq 10\%$, and IGA ≥ 3 . The primary intervention was the administration of secukinumab 300 mg subcutaneously with a loading dose regimen in the first week of therapy, followed by administration every four weeks.

Some studies have compared secukinumab with other biologics such as ustekinumab and guselkumab, while others have used a placebo as a control. In addition to assessing clinical outcomes, some studies have also evaluated inflammatory biomarkers, histopathological changes, and transcriptomic responses after secukinumab therapy.

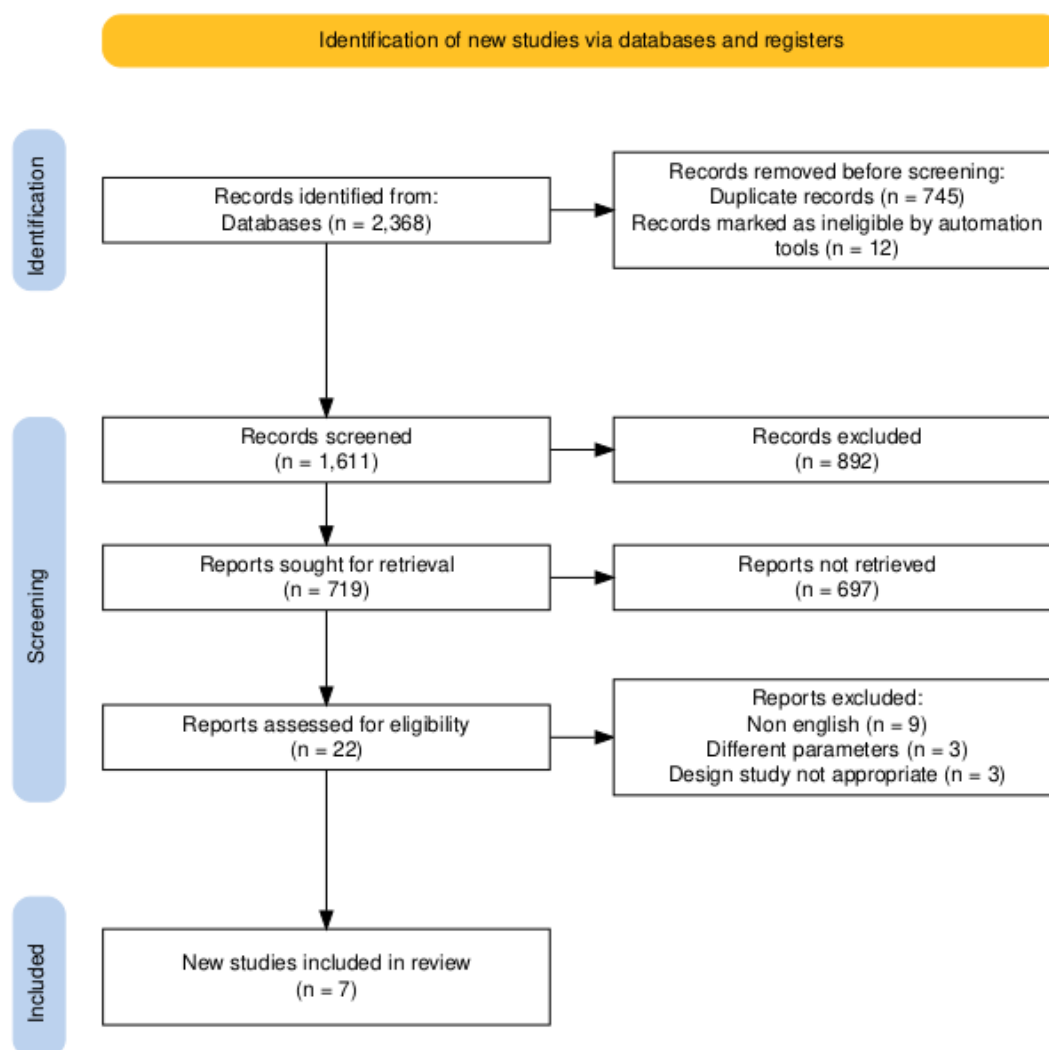


Figure 1. PRISMA flow diagram for included studies

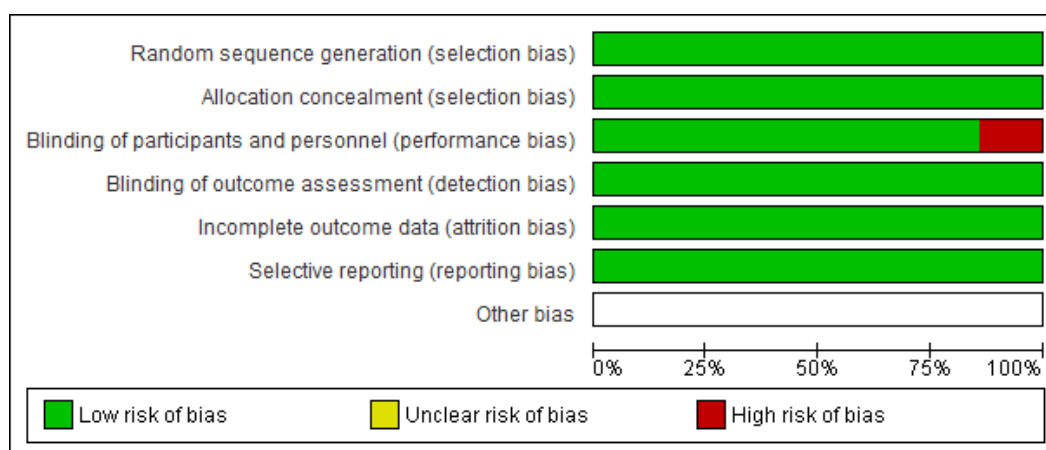


Figure 2. Risk of Bias Summary

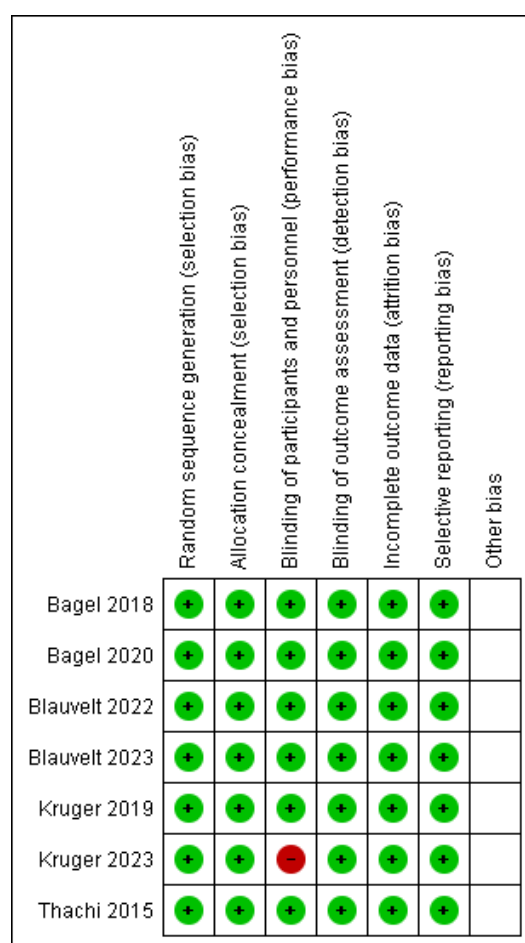


Figure 3. Risk of Bias Graph

Efficacy Outcome

A summary of secukinumab efficacy and safety outcomes is presented in Table 2. In general, all studies showed that secukinumab has high efficacy in the management of moderate to severe psoriasis. In the CLEAR study by Thaçi et al. (2015), secukinumab demonstrated superiority over ustekinumab in achieving PASI90 at week 16, with a success rate of 79.0% compared to 57.6%. PASI100 achievement and DLQI improvement were also higher in the secukinumab group. This study demonstrated that IL-17A inhibition provided a faster and better clinical response than IL-12/23 inhibition (Thaçi et al., 2015).

Similar results were also found in the CLARITY study by Bagel et al. (2018), where secukinumab provided a PASI90 achievement of 66.5% compared to 47.9% in the ustekinumab group at week 12. Clinical responses began to be seen from week 4 and continued to increase until week 16. Patient quality of life assessed using the DLQI also showed better improvement in the secukinumab group. Long-term evaluation of the 52-week CLARITY study by Bagel et al. (2020) showed that secukinumab's superiority persisted through week 52. The percentage of patients achieving PASI90, IGA 0/1, and DLQI 0/1 remained higher than in the ustekinumab group (Bagel et al., 2018).

In the ECLIPSE study by Blauvelt et al. (2022), secukinumab showed a faster onset of response than guselkumab, although guselkumab had better long-term efficacy in certain patient subpopulations, particularly those with a high body mass index and older age (Blauvelt et al., 2022). Several studies have also evaluated the molecular effects of secukinumab. A study by Krueger et al. (2019) showed that IL-17A inhibition with secukinumab rapidly suppressed the IL-23/IL-17 inflammatory pathway, improved the histopathological appearance of psoriasis, and normalized the transcriptomic profile of psoriasis lesions (Krueger et al., 2019).

The ObePso-S study by Blauvelt et al. (2023) showed that long-term clinical response correlated with normalization of inflammatory biomarkers such as keratin-16 (K16) and the psoriasis transcriptome. Patients who achieved PASI90 had better reductions in inflammatory markers than non-responders (Blauvelt et al., 2022). The ARROW study by Krueger et al. (2023) showed that secukinumab provided better clinical, histological, and molecular resolution than guselkumab in psoriasis plaques refractory to ustekinumab (Krueger et al., 2023).

Security Outcomes

Overall, all studies demonstrated that secukinumab had a good safety and tolerability profile. The most frequently reported adverse events included nasopharyngitis, upper respiratory tract infection, headache, and injection site reactions. Most side effects were mild to moderate and did not require discontinuation of therapy.

Serious adverse events

The reported effects were low and did not show significant improvement compared to the control group or comparator biologics such as ustekinumab and guselkumab. No increased risk of severe immunological disorders was observed during the study period. The overall safety profile of secukinumab across all studies is consistent with previous clinical research and supports its long-term use in patients with moderate to severe psoriasis.

DISCUSSION

Psoriasis is a chronic, immune-mediated inflammatory disease characterized by erythematous, scaly plaques that can affect various areas of the body. This disease not only causes physical impairment but also significantly impacts patients' quality of life due to itching, pain, psychosocial disturbances, and an increased risk of systemic comorbidities such as psoriatic arthritis, cardiovascular disease, and metabolic syndrome (AlQusaimi et al., 2025). In moderate to severe psoriasis, conventional therapies such as topical corticosteroids, phototherapy, methotrexate, cyclosporine, and acitretin often provide a less than optimal response and have limitations in long-term use due to organ toxicity side effects (Gao et al., 2025). The development of biologic therapies is a significant advancement in modern psoriasis management (Chan, 2025).

Biologic agents are drugs developed using recombinant biotechnology and designed to target specific molecules in the disease's immunopathogenesis pathway. The development of biologics for psoriasis began with the discovery of the important role of proinflammatory cytokines such as tumor necrosis factor- α (TNF- α), IL-12/23, and IL-17 in the inflammatory process of psoriasis. The first generation of biologics for psoriasis consisted of TNF- α inhibitors such as etanercept,

infliximab, and adalimumab (Gonçalves et al., 2025). Subsequently, IL-12/23 inhibitors, such as ustekinumab, developed, and the latest generation, IL-17 and IL-23 inhibitors, have demonstrated greater efficacy in achieving near-total or complete improvement of skin lesions (Brownstone et al., 2021).

One of the currently widely used biologic agents is secukinumab. Secukinumab is a human immunoglobulin G1 kappa (IgG1κ) monoclonal antibody that selectively targets IL-17A. IL-17A is a major pro-inflammatory cytokine that plays a central role in the pathogenesis of psoriasis (Berg et al., 2021). In psoriasis, dendritic cell activation leads to increased IL-23 production, which then activates T helper 17 (Th17) cells. Th17 cells produce IL-17A, IL-17F, and other inflammatory cytokines that stimulate keratinocyte proliferation, increase the production of chemokines and inflammatory mediators, and maintain the chronic inflammatory process in the skin. The IL-23/IL-17 pathway is currently considered a key immunological pathway in psoriatic plaque formation (Aboobacker et al., 2026; Malagoli et al., 2024; Utama et al., 2024; Fargnoli, 2019).

Secukinumab works by specifically binding to IL-17A, thereby preventing its interaction with its receptors on keratinocytes and other inflammatory cells. Inhibition of IL-17A leads to decreased production of proinflammatory cytokines, chemokines, and antimicrobial proteins that play a role in epidermal hyperproliferation and psoriatic lesion formation. In addition to improving clinical manifestations, IL-17A inhibition also plays a role in suppressing the "feed-forward inflammatory loop" that maintains chronic inflammation in psoriasis (Aboobacker et al., 2026; Malagoli et al., 2024; Fargnoli, 2019).

The results of this systematic review demonstrate that secukinumab has excellent efficacy in the management of moderate to severe psoriasis. All analyzed studies demonstrated that secukinumab was able to provide significant clinical improvements, particularly in the PASI, IGA, and DLQI parameters. The current target for modern psoriasis therapy is no longer solely achieving PASI75, but rather focuses on achieving PASI90 or even PASI100, an indicator of near-clear or perfectly clear skin.

The CLEAR study by Thaçi et al. demonstrated that secukinumab was superior to ustekinumab in achieving PASI90 and PASI100. At week 16, PASI90 was achieved in 79.0% of patients receiving secukinumab compared to 57.6% in the ustekinumab group. Secukinumab also provided greater improvements in quality of life based on DLQI scores (Thaçi et al., 2015). These findings suggest that direct inhibition of IL-17A provides a more potent clinical effect than IL-12/23 inhibition (Menter et al., 2021).

Similar results were also found in the CLARITY study by Bagel et al., which showed that secukinumab provided a faster clinical response than ustekinumab. Improvements in PASI90 and IGA 0/1 were seen as early as week 4 of therapy and continued to increase through week 16 and week 52. The rapid onset of therapy is one of secukinumab's main advantages over several other biologic agents, making it particularly beneficial in patients with severe disease who require rapid inflammation control (Bagel et al., 2020; Bagel et al., 2018).

The ECLIPSE study by Blauvelt et al. showed that in long-term evaluation, guselkumab as an IL-23 inhibitor had better efficacy in several patient subpopulations compared to secukinumab, especially in obese and elderly patients, although secukinumab still showed a faster onset of response (Blauvelt et al., 2022). These findings indicate that the selection of biologics in psoriasis needs to consider individual patient characteristics, comorbidities, and short-term and long-term therapeutic targets (Schwarz et al., 2024).

In addition to clinical benefits, several studies have also demonstrated the molecular effects of secukinumab on psoriasis pathogenesis. A study by Krueger et al. showed that IL-17A inhibition suppressed the expression of various inflammatory genes associated with psoriasis and improved the histopathological appearance of skin lesions. Decreases in IL-23, IL-17A, IL-17F, β -defensin, and other inflammatory markers were found early in therapy, indicating that secukinumab works not only clinically but also molecularly (Krueger et al., 2023).

The ObePso-S study also showed that patients who achieved PASI90 had better normalization of inflammatory biomarkers, including keratin-16 (K16) and psoriasis transcriptome (Blauvelt et al., 2023). This suggests that clinical improvement with secukinumab is closely related to the resolution of inflammation at the cellular and molecular levels.

The ARROW study provided important findings regarding the possible existence of an IL-23-independent IL-17 production pathway in psoriasis. In plaque psoriasis refractory to ustekinumab, secukinumab demonstrated better clinical and molecular resolution than guselkumab (Krueger et al., 2023). This suggests that some IL-17A production may occur independently of IL-23, thus direct inhibition of IL-17A remains effective in some cases of refractory psoriasis (Katsouli et al., 2026; Navarro-Compán et al., 2023).

In terms of safety, all studies demonstrated that secukinumab had a good safety and tolerability profile. The most frequently reported adverse events were nasopharyngitis, upper respiratory tract infection, headache, and injection site reactions. Most side effects were mild to moderate and rarely led to discontinuation of therapy. Serious adverse events were low in number and not significantly different compared to the comparison biologic or placebo. These findings indicate that secukinumab is relatively safe for long-term use in moderate to severe psoriasis (Acer et al., 2024; Zhao et al., 2021).

Although the results of this systematic review demonstrate the excellent efficacy of secukinumab, the study still has several limitations. Most of the included studies were funded by the pharmaceutical industry, potentially introducing sponsorship bias. There was heterogeneity in study design, follow-up duration, and outcome measures across studies. Some studies also had relatively small sample sizes, particularly in molecular and translational studies.

Overall, the results of this systematic review demonstrate that secukinumab is an effective and safe biologic agent in the management of moderate to severe psoriasis. Secukinumab provides a rapid clinical response, high PASI90 and PASI100 achievement rates, and significant quality of life improvements, with a favorable safety profile. Furthermore, IL-17A inhibition also exerts significant molecular effects on the inflammatory pathways of psoriasis, supporting a central role for IL-17A in the pathogenesis of this disease.

CONCLUSION

Secukinumab is an effective and safe biologic therapy in the management of moderate to severe psoriasis. As an interleukin-17A (IL-17A) inhibitor, secukinumab works by inhibiting a key inflammatory pathway in psoriasis pathogenesis, thereby reducing inflammation and rapidly and sustainably improving skin lesions. Secukinumab also demonstrates a favorable safety profile, with generally mild to moderate side effects and a low rate of serious adverse events. Therefore, secukinumab may be an effective biologic therapy option for patients with moderate to severe psoriasis.

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