Asian Journal of Pharmaceutical and Health Sciences
www.ajphs.com

Secukinumab achieves successful outcomes in Plaque Psoriasis: A case report

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ARTICLE HISTORY

Received: 20.08.2024

Accepted: 07.09.2024

Available online: 31.12.2024

DOI:

10.5530/ajphs.2024.14.72

KEYWORDS:

Psoriasis, Secukinumab, PASI, Biological agents

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ABSTRACT

Psoriasis is a chronic inflammatory disorder that primarily affects the skin and joints, with plaque psoriasis being the most prevalent form. It manifests as large, scaly lesions and may lead to joint complications in approximately 15% of cases. The condition arises from an abnormal immune response, characterized by keratinocyte hyperproliferation and T-cell dysfunction, influenced by genetic and environmental factors. The Psoriasis Area and Severity Index (PASI) is essential for evaluating disease severity and treatment response. This case report discusses a 31-year-old male diagnosed with chronic plaque psoriasis at age 27, initially treated with Apremilast and topical therapies, which yielded limited improvement. Methotrexate was later introduced but was discontinued due to persistent lesions and elevated liver enzymes. In September 2024, following an increase in his PASI score to 44.6, the patient began treatment with secukinumab, an IL-17A-targeting biologic. After five weeks of subcutaneous injections, he experienced significant clinical improvement, with no new lesions and reduced PASI scores. This case underscores secukinumab's efficacy as a treatment option for moderate-to-severe psoriasis in patients unresponsive to conventional therapies.

INTRODUCTION

Psoriasis is a common, chronic inflammatory disease affecting skin and joints, with plaque psoriasis as the most prevalent form. Characterized by large, scaly patches on areas like the scalp and trunk, it often flares and may lead to joint issues in about 15% of cases. The immune system's abnormal response, including keratinocyte hyperproliferation and T-cell dysfunction, plays a key role in psoriasis, with genetics and factors like oxidative stress and growth factor imbalances also contributing. [1]The Psoriasis Area and Severity Index (PASI) is a key tool for evaluating disease severity and tracking treatment progress. [2]

Methotrexate and cyclosporine A are typically recommended as the first-line systemic treatments for psoriasis. In cases where these are ineffective, second-line options include sulfasalazine, mycophenolate mofetil, and acitretin. Phototherapy can be utilized alongside systemic medications, and if these combinations do not yield significant results, biologic agents may be considered.[7] Topical treatments are commonly used for mild to moderate psoriasis, with emollients and moisturizers supporting skin barrier function and hydration. Typical initial topical options include coal tar, dithranol, corticosteroids, vitamin D analogs, and retinoids.[2]

Biologic treatments, composed of engineered proteins that target immune pathways in psoriasis, include drugs like infliximab, adalimumab, etanercept and interleukin blockers. Prior to initiating biologics, it is essential to screen patients for tuberculosis and hepatitis due to the elevated risk of infections, ensuring the patient's immune system is not overly compromised.[2]Several biologics are currently approved for treating moderate-to-severe plaque psoriasis in numerous countries worldwide.[4]

Secukinumab is a fully human IgG1 monoclonal antibody

designed to specifically target IL-17A.[3] Produced by Novartis Pharmaceuticals, secukinumab received FDA approval in the United States on January 21, 2015, for treating psoriasis. It is the first and only IL-17A inhibitor specifically approved for moderate to severe plaque psoriasis in adults who are eligible for systemic treatment or phototherapy.[4]In 2016, it also received approval for treating psoriatic arthritis.[3]For adults with plaque psoriasis, the advised dosage of secukinumab is 300 mg, administered as two 150-mg subcutaneous injections at weeks 0, 1, 2, 3, and 4, and then once every 4 weeks. For some individuals, a 150-mg dose may be suitable, and this is also the starting dose recommended for those prescribed secukinumab for psoriatic arthritis.[3]After injection, peak concentration occurs around 6 days, with steady-state levels reached in approximately 24 weeks. [3] With subcutaneous administration, the average bioavailability of secukinumab is around 73%, aligning with the bioavailability estimates for other human IgG1 monoclonal antibodies.[6] Distribution studies indicate that secukinumab has a restricted distribution to peripheral compartments, with a volume of distribution ranging from 7.1 to 8.6 liters during the terminal phase following a single intravenous administration. [5] Here, we present a case report of a 31-year-old man with chronic plaque psoriasis who achieved successful treatment with secukinumab, without the use of any concurrent systemic agents during the course of therapy.

MATERIALS AND METHODS

A 31 year old male presented to the Dermatology and Venereology department with chronic plaque psoriasis, which he developed at age 27 in 2020. He reported erythematous plaques with white scales affecting his trunk, scalp, and both upper and lower extremities. The patient had no notable comorbidities and was not taking any other medications. His Psoriasis Area and Severity Index (PASI) score was recorded at 42.4.

Initially, he was prescribed oral Apremilast at a dosage of 30 mg twice daily, supplemented with appropriate topical treatments which included moisturisers and corticosteroids. He also received antioxidants and Vitamin E as part of his regimen. Despite this treatment, the patient experienced the emergence of new lesions on his legs and elbows while continuing Apremilast.

He was prescribed oral Methotrexate at a dose of 7.5 mg once weekly alongside Apremilast but due to inadequate response, his Methotrexate dosage was adjusted to 5 mg weekly for two weeks, and Apremilast was tapered down to 20 mg daily for one month. At this point, his liver enzyme levels (SGOT/SGPT) were noted to

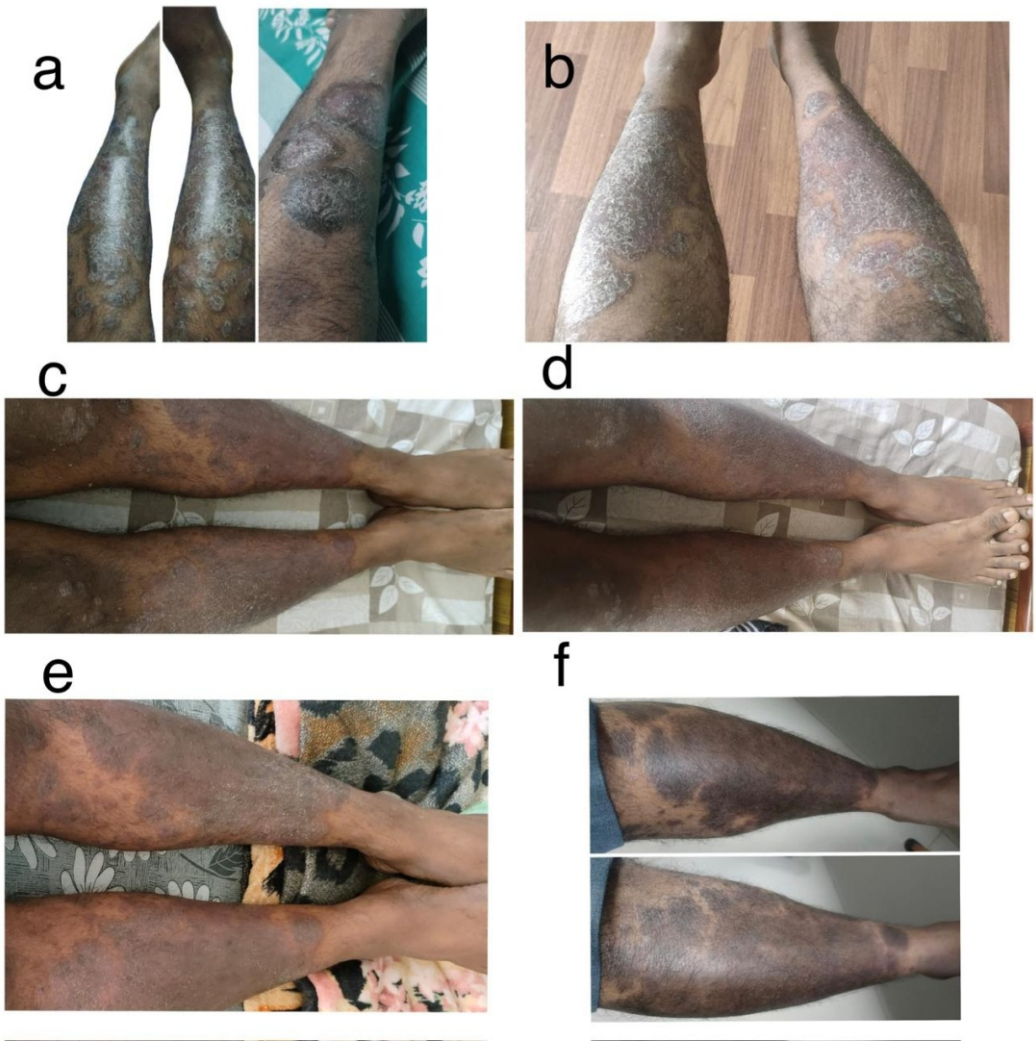

Fig.1: Shows the physical examination of the patient, (a) before secukinumab treatment, (b) after 0th dose, (c) after 1st dose, (d) after 2nd dose, (e) after 3rd dose and, (f) after 4th dose.

Table 1 : Patient's PASI score progression

WEEK	PASI	SECUKINUMAB INJECTION 300MG
0	37.1	1
1	31.5	2
2	24.7	3
3	13.7	4
4	10.6	5

be 31/61. However, there was no significant improvement, and new lesions reappeared while he was taking methotrexate at 5 mg weekly and Apremilast at 20 mg daily. Consequently, the patient discontinued Apremilast and continued solely with Methotrexate. This led to persistent new lesions and a worsening of transaminitis, with SGOT/SGPT levels increasing to 40/92. An abdominal ultrasound performed revealed mild hepatomegaly and Grade 1-2 hepatic steatosis.

After stopping Methotrexate, the patient was scheduled to start biological therapy with subcutaneous Secukinumab. At the time of Secukinumab introduction, the patient had diffuse erythematous, inflammatory patches and plaques covered with white scales predominantly on his upper and lower extremities, his PASI score had increased to 44.6. He received 300mg dose of Secukinumab, on a weekly basis. Prior to the injection, the patient's blood pressure and glucose levels were monitored, with follow-up measurements taken 20 and 45 minutes post-injection. The patient continued to receive five weekly injections of Secukinumab (at weeks 0, 1, 2, 3, and 4) followed by monthly maintenance doses. Notably, he did not experience any new lesion development and showed substantial improvement in his PASI scores, indicating a favorable response to the treatment (see Table 1). Improvements on the skin lesions of the patient can be seen in figure1 (a), (b), (c), (d), (e) and (f).

In conjunction with Secukinumab, he was also provided with suitable topical therapies, including salicylic acid shampoo and moisturizers, to further enhance skin hydration and barrier function.

DISCUSSION

Plaque psoriasis is an autoimmune condition marked by the development of skin lesions, which can significantly impact quality of life. It is believed to be linked to inflammatory cytokines like tumor necrosis factor (TNF)-α, interleukin (IL)-17, and IL-23.[11] Plaque psoriasis is the most prevalent form of the condition, affecting about 80-90% of individuals. It typically presents as well-defined, red, and scaly plaques of varying sizes, which can appear either locally or spread across the skin. For many individuals, these plaques may cause intense itching or pain. As a systemic inflammatory disorder, the effects of psoriasis extend beyond the skin. Around 20-30% of individuals with plaque psoriasis will develop or already have psoriatic arthritis. Additionally, psoriasis is linked to an increased risk of metabolic syndrome, cardiovascular disease, inflammatory bowel disease, lymphoma, and depression.[4]

Biologics are recommended for patients with moderate-to-severe plaque psoriasis, especially for those who have not responded to, have contraindications to, or cannot tolerate standard systemic treatments such as topical therapies, phototherapy, cyclosporine, methotrexate, and PUVA. [4,9]

In this particular case,he was initially given a 300 mg dose of secukinumab, administered as two 150 mg subcutaneous injections, one in each arm, the patient continued with five weekly injections of secukinumab (at weeks 0, 1, 2, 3, and 4), followed by monthly maintenance doses. Remarkably, no new lesions developed, and there was significant improvement in his PASI scores, suggesting a positive response to the treatment.Phung M et al.[12] presented a case series that included a 50-year-old woman with psoriasis on her arms, legs, and trunk. After 12 weeks of secukinumab therapy, she had not reached a PASI-75 response. By week 52, her PASI score was 5.1, prompting a dosage adjustment to 300 mg every three weeks. Following this change, complete skin clearance was achieved within 12 weeks, with no adverse events reported throughout the treatment.

Damayanti D et al.[7] reported that a patient receiving five weekly subcutaneous injections of secukinumab at 150 mg, followed by a 150 mg injection one month later, showed visible improvement in skin lesions by the third week. Two weeks after the final injection, the patient achieved a PASI 60 response, with the PASI score reduced to 6 and the DLQI score dropping to 0. Biological systemic therapy offers several advantages, including an excellent therapeutic response (with patients often reaching PASI 90 or 100), increased safety, and fewer side effects compared to non-biologic systemic treatments.

Mona Malakouti et al.[9] emphasized the importance of monitoring potential side effects when administering secukinumab. Patients should undergo regular evaluations for both immediate and long-term adverse effects, including clinical assessments and laboratory tests. Secukinumab is generally well-tolerated in individuals with moderate-to-severe psoriasis. A pooled analysis of four clinical trials conducted during the first 12 weeks revealed that the most common adverse events, occurring in more than 1% of patients, included nasopharyngitis, upper respiratory tract infections, diarrhea, rhinitis, oral herpes, pharyngitis, and urticaria.In this patient, no significant side effects were observed during the 4 week monitoring period.

Rønholt K et al.[10] highlighted that secukinumab provides a faster onset of action compared to older biologics. It is highly effective, showing higher PASI 90 and PASI 100 response rates

compared to ustekinumab.

Kostaki D et al.[13] described a patient who received five weekly subcutaneous injections of secukinumab at 300 mg, followed by monthly maintenance doses. After four weeks of treatment, the patient demonstrated significant improvement, with the PASI score reduced to 11 and body surface area (BSA) involvement decreased to 23%.

Augustin M et al.[14] reported that secukinumab has shown both effective and rapid improvement in clinical outcomes, with sustained long-term benefits in managing moderate-to-severe psoriasis in real-world settings, as evidenced by improved PASI scores. In this analysis, 80% of patients achieved PASI 75, and over half of those who continued secukinumab treatment reached complete symptom clearance (PASI 100) within 12 months.

Langley et al.[15] in their randomized controlled trial demonstrated significant improvement in patients with plaque psoriasis who received secukinumab at doses of 300 mg and 150 mg compared to placebo by week 12, achieving the efficacy target of PASI 75. In this study, 81.6% of patients on the 300 mg dose and 71.6% on the 150 mg dose reached PASI 75 at week 12. Additionally, a greater proportion of patients in both secukinumab groups achieved a Dermatology Life Quality Index (DLQI) score of 0 or 1, indicating no deterioration in quality of life, compared to the placebo group. These results suggest that the 150 mg dose of secukinumab may offer comparable efficacy to the 300 mg dose.

Bissonnette R et al.[17] reported that in the SCULPTURE extension study, patients with moderate-to-severe psoriasis treated with secukinumab 300 mg sustained skin clearance, improved quality of life, and a favorable safety profile over five years, aligning with the outcomes observed in earlier phase 2/3 trials.

CONCLUSION

Secukinumab is a highly effective anti-IL-17A biologic used to treat moderate to severe plaque psoriasis. It is known for producing a rapid clinical response and significantly enhancing health-related quality of life. This case highlighted the effectiveness of secukinumab at a 300 mg dose in treating plaque psoriasis.

Declaration of patient's consent

The authors certify that all necessary patient consent forms have been obtained. In these forms, the patient(s) have granted permission for their images and other clinical information to be published in the journal. The patients are aware that their names and initials will not be disclosed, and every effort will be made to protect their identity, though complete anonymity cannot be guaranteed.

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Cite this article : Aleena Muhammed Sadi, Lakshmi R, Krithi Raviraj Ullal
Secukinumab achieves successful outcomes in Plaque Psoriasis: A case report
Asian J. Pharm. Hea. Sci.. 2024;14(4):3031-3035. DOI : 10.5530/ajphs.2024.14.71