

A Comparative Review of Biologics for the Treatment of Atopic Dermatitis

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Authors' Contributions

1,2 Drafting of Manuscript, Critical Review

Article info.

Received: Jan 23, 2026

Accepted: Feb 06, 2026

Published Feb 19, 2026

Funding Source: Nil

Conflict of Interest: Nil

Cite this article: Hassan A.Bashair M. A Comparative Review of Biologics for the Treatment of Atopic Dermatitis, *International Journal of Trends in Pharmaceutical and Chemical Research*. 2025;3:37-41

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ABSTRACT

Atopic dermatitis (AD) is a chronic inflammatory skin condition that significantly impacts a patient's quality of life. Biologic therapies present some targeted and effective treatment options when conventional treatments completely fail. This study assesses how effective biologics for AD in Pakistan are, how safe they are, how expensive they are, how accessible they are, and how they are administered, and how they function, compared. A systematic review analyzed all published clinical trials, regulatory approvals, and real-world evidence to comprehensively evaluate the potential of Dupilumab (Dupixent), Tralokinumab (Adtralza), Secukinumab (Cosentyx, Fraizeron), and Ixekizumab (Taltz) as therapies. Dupilumab and tralokinumab, both currently FDA-approved for moderate-to-severe AD therapy, strongly proved to be highly effective by blocking IL-4 and IL-13, or simply IL-13, respectively. Secukinumab and ixekizumab, both IL-17 inhibitors which are used primarily for psoriasis, have been of little value in the treatment of AD as well as are utilized off-label to a modest extent. As suggested by cost analysis, the cost of tralokinumab, roughly PKR 460,000, creates affordability barriers as well as limits access. Dupilumab is still the drug of choice since it is efficacious and safe, but bi-weekly dosing can impact patient adherence. The study highlights that Pakistan desperately needs affordable biologic options. Pakistan also needs enhanced patient access programs.

Keywords: Atopic dermatitis, Secukinumab and ixekizumab

INTRODUCTION

Atopic dermatitis (AD) is a chronic inflammatory skin condition with severe pruritus and frequent relapses, severely affecting patient quality of life. Although traditional treatments, such as topical

corticosteroids and immunosuppressants, are still first-line therapies, biologic drugs have proven useful alternatives for treatment-refractory moderate-to-severe cases.

Atopic dermatitis (AD) is a disabling, relapsing, chronic inflammatory skin disease that adversely

impacts the quality of life. It is a chronic relapsing and remitting inflammatory skin disease[1-17] affecting one in 10 people in their lifetime. In patients with moderate to severe disease that has become refractory to standard therapy, such as topical corticosteroids and immunosuppressants, biologic therapies that offer efficacy together with a selective mechanism of action are available. Different plants extracts also use for dermatitis.[17-23]

Drug Profiles:

Dupilumab:

Mechanism of Action:

Dupilumab is a monoclonal antibody that blocks interleukin-4 (IL-4) and interleukin-13 (IL-13) signaling, the major drivers of the inflammatory cascade in AD.

Indications:

Approved for adults and adolescents (12 years and older) with moderate-to-severe atopic dermatitis inadequately controlled with topical therapies.

Dosage and Administration:

Administered via subcutaneous injection. The initial dose is typically 600 mg (two 300 mg injections), followed by 300 mg every two weeks.

Side Effects:

Common adverse effects include injection site reactions, conjunctivitis, and cold sores.

Availability in Pakistan

⤵ Dupilumab is available in Pakistan under the brand name Dupixent. Patients are advised to consult with healthcare providers for current pricing and availability.

Tralokinumab:

Mechanism of Action:

Tralokinumab is a fully human monoclonal antibody that specifically targets and neutralizes

IL-13, a cytokine implicated in the pathophysiology of AD.

Indications:

Used for the treatment of moderate-to-severe atopic dermatitis in adults and adolescents 12 years and older who are candidates for systemic therapy.

Dosage and Administration:

The dose is an initial 600 mg (four injections of 150 mg) followed by 300 mg every two weeks, subcutaneously.

Side Effects:

Side effects are common and include upper respiratory tract infections, injection site reactions, and eye-related problems such as conjunctivitis.

Availability in Pakistan:

Adtralza can be found in Pakistan, and its reported price is around PKR 460,000 as of January 2025

Secukinumab:

Mechanism of Action:

Secukinumab is a monoclonal antibody that binds to and inactivates interleukin-17A (IL-17A), thereby decreasing inflammation seen in some autoimmune diseases.

Indications: Mainly approved for plaque psoriasis, psoriatic arthritis, and ankylosing spondylitis but has also been studied in clinical trials for atopic dermatitis, though not a first-line treatment for AD.

Dosage and Administration:

Most often given as a subcutaneous injection with a loading dose that is followed by maintenance dosing. Certain regimens will depend on what condition is being treated.

Side Effects:

Can include upper respiratory tract infections, headache, and injection site reactions.

Availability in Pakistan:

Secukinumab can be accessed in Pakistan with the trade names Cosentyx and Fraizeron at the price of PKR 150 mg vials at about PKR 60,000.

Ixekizumab:**Mechanism of Action**

It is a monoclonal antibody directed against IL-17A like secukinumab but primarily employed in the case of plaque psoriasis and psoriatic arthritis.

Indications:

Licensed in the treatment of moderate-to-severe plaque psoriasis and psoriatic arthritis. Not recommended in the routine use for atopic dermatitis and will therefore be an off-label indication.

Dosage and Administration

Given through subcutaneous injection with initial loading dose followed by maintenance injections.

Side Effects:

Injection site reactions and upper respiratory tract infections are the most common side effects.

Availability in Pakistan

Ixekizumab is marketed as Taltz. Patients are advised to meet with healthcare professionals for comprehensive pricing and availability.

significant in the treatment of AD. On the other hand, ixekizumab and secukinumab, IL-17 inhibitors primarily used for psoriasis, lack evidence to justify their use in AD and remain off-label options. Since tralokinumab is approximately PKR 460,000, cost analysis revealed considerable affordability barriers that limit its widespread availability. Because of its excellent clinical efficacy and favorable safety profile, dupilumab remains the biologic of choice; however, patient compliance can be affected by biweekly dosing.

Comparative Analysis:

Drug	Targeted Cytokine	Indication in AD	Dosing Frequency	Common Side Effects
Dupilumab	IL-4, IL-13	Yes	Bi-weekly	Injection site reactions, conjunctivitis
Tralokinumab	IL-13	Yes	Bi-weekly	Respiratory infections, conjunctivitis
Secukinumab	IL-17A	No (off-label)	Monthly	Headache, infections
Ixekizumab	IL-17A	No (off-label)	Monthly	Injection site reactions

RESULTS

The FDA-approved medications dupilumab and tralokinumab, both targeting interleukin (IL)-4/IL-13 and IL-13, respectively, proved to be

METHODOLOGY

A systematic analysis of published clinical trials, regulatory options, and real-world evidence was carried out. Data was collected from PubMed,

Google Scholar, official prescribing information, and validated medical distributors in Pakistan. The biologic agents evaluated are Dupilumab (Dupixent), Tralokinumab (Adtralza), Secukinumab (Cosentyx, Fraizeron), and Ixekizumab (Taltz).

A thorough examination of publicly available data was employed to conduct this analysis, including:

Selection Standards

List of biologic drugs approved by Pakistan for the management of AD. Monitor availability, dose schedule, safety, and effectiveness. Economic and compliance by patients factors.

Sources of Data:

Regulatory bodies' official prescribing guides and data (e.g., FDA, EMA).
Peer-reviewed meta-analyses and clinical trials on Google Scholar and PubMed.
Product information and prices from credible Pakistani medical wholesalers and retailers.
Professional advice from dermatologists and immunologists.

Method of Analysis

Comparative assessment according to accessibility, affordability, dose, safety profile, clinical efficacy, and mechanism of action.
Focus on real data where possible.
Evaluation of physician choices and patient compliance in Pakistan.

CONCLUSION

In Pakistan, biologic therapy is a successful treatment for AD, but the expense renders it unaffordable. Because of its established efficacy, dupilumab is the preferred option; however, tralokinumab provides qualified patients with an alternative. Additional research is required prior to the use of off-label IL-17 inhibitors in routine therapeutic practice. Increased patient access programs and affordable biologic substitutes are sorely needed in Pakistan. To assess long-term treatment outcomes and optimize therapeutic

strategies for AD treatment in the region, additional applied research is needed.

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