European Journal of Clinical Pharmacy

Print ISSN: 2385-409X **Online ISSN**: Applied
Website: https://farmclin.es/

Original Research Article

Dupilumab for Treating Moderate to Severe Atopic Dermatitis

Article History:

Name of Author:
Andres S.R. and Dolores C.C.M.

Corresponding Author:
Andres S.R.

How to cite this article:
Andres S.R. and Dolores C.C.M. Dupilumab for Treating Moderate to Severe Atopic Dermatitis. *Eur J Clin Pharm.* 2020;2(1);45.47.

Received: 20-07-2020
Revised: 28-07-2020
Accepted: 12-08-2020
Published: 29-08-2020

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Abstract: Dupilumab, a monoclonal antibody targeting the interleukin-4 (IL-4) and interleukin-13 (IL-13) pathways, represents a major advance in the management of moderate to severe atopic dermatitis (AD). This article reviews its mechanism, clinical outcomes, safety, and real-world application, combining evidence from pivotal trials and observational cohorts. Key efficacy parameters, safety concerns, and practice guidelines are discussed, with graphical data to illustrate its impact.

Keywords: Dupilumab, Atopic Dermatitis (AD), Interleukin-4 (IL-4), Interleukin-13 (IL-13), Clinical Outcomes.

INTRODUCTION

Atopic dermatitis is a chronic, relapsing inflammatory skin disease defined by eczematous lesions and intense pruritus, significantly impairing quality of life. Moderate to severe forms often resist conventional topical or systemic therapies. Dupilumab, the first biologic approved for this indication, has reshaped the therapeutic landscape by providing targeted, steroid-sparing disease control[1][2].

MECHANISM OF ACTION

Dupilumab is a fully human monoclonal antibody that blocks the shared receptor for IL-4 and IL-13, key cytokines in the T-helper 2 (Th2)-mediated inflammatory cascade central to AD pathogenesis. By inhibiting these cytokines, dupilumab reduces tissue inflammation, limits immune hypersensitivity, and improves skin barrier function[2][3].

Key Mechanistic Effects

- Inhibition of Th2-driven inflammation
- Restoration of skin barrier proteins
- Downregulation of IgE class-switching and eosinophil activation

Clinical Trials and Efficacy

Phase 3 Trials

Large randomized phase 3 trials (SOLO 1, SOLO 2, CHRONOS) established dupilumab's efficacy for moderate to severe AD not adequately controlled by topical therapy.

© 2020 European Journal of Clinical Pharmacy; Volume: 2; Issue: 1| All Right Reserved

- **EASI-75 (75% improvement in Eczema Area and Severity Index) at 16 weeks:** ~44-52% with dupilumab vs. 12-15% with placebo.
- **Investigator Global Assessment (IGA) 0/1 (clear/almost clear):** 36-39% dupilumab vs. 8-11% placebo.
- **Pruritus reduction:** Mean decrease ~55% in dupilumab, ~15% in placebo[4][5].

Outcome	Placebo (%)	Dupilumab (%)
EASI-50 (≥50% improvement)	35	85
EASI-75 (≥75%)	12–14	44–52
IGA 0/1	8–11	36–39
Pruritus reduction	15	55

Durability and Long-term Data
Open-label extension studies confirm sustained efficacy and safety up to four years:

- **EASI score reduction sustained at 90% or higher**
- **Pruritus reduction sustained at over 65% relative to baseline**
- Significant, durable improvements in quality-of-life metrics (DLQI) and sleep quality[6][7].

Real-World Effectiveness
Observational studies and registries report comparable effectiveness with clinical trials, confirming that real-world patients achieve rapid and sustained improvements in disease severity and pruritus. Drug retention rates remain high at 1 year, and most discontinuations are due to insurance or non-adherence rather than efficacy/safety[8].

Safety and Tolerability
Dupilumab is generally well tolerated and not immunosuppressive. The frequency and severity of adverse events in trials and registries are as follows[2][9]:

Adverse Event	Dupilumab (%)	Placebo (%)
Injection-site reactions	8–10	~6
Conjunctivitis	15–26	6–11
Headache	8–10	~9
Skin infections	Lower than placebo	Higher in placebo
Herpetic infections	Rare	Rare

Most events are mild to moderate. Conjunctivitis (eye inflammation) is noteworthy and should be monitored but rarely leads to discontinuation[8].

Patient-Reported Outcomes
Dupilumab profoundly reduces itch, skin pain, and sleep disturbance, dramatically improving daily function and mental health:

- **Dermatology Life Quality Index (DLQI) reductions:** Mean |9–10 points|
- **Itch NRS (0–10) reductions:** Mean |5–6 points lower|
- **Reduced flares, improved sleep, and greater productivity**

Treatment Guidelines and Recommendations
National and international guidelines endorse dupilumab for patients aged 6 months and older with moderate-to-severe AD that is not controlled by topical or systemic therapies, or where these are contraindicated[4][10][11][12].

- **Eligibility:** Insufficient response/intolerance to one or more conventional systemic treatments (cyclosporine, methotrexate, etc.)
- **Assessment:** Continue if ≥50% EASI reduction and ≥4-point DLQI improvement after 16 weeks. Discontinue if not achieved[11].
- **Combination Therapy:** May be used with topical corticosteroids; combination increases efficacy without added safety risk.

 © 2020 European Journal of Clinical Pharmacy; Volume: 2: Issue: 1| All Right Reserved

Economic and Practice Impact

The cost-effectiveness of dupilumab is within the range considered acceptable for major healthcare systems, especially considering its profound QOL and disease-burden reductions[13].

Graph: Percentage of Patients Achieving EASI-75 at Week 16

Treatment	EASI-75 (%) at Week 16
Placebo	13
Dupilumab	48

CONCLUSION

Dupilumab is a transformative therapy for moderate to severe atopic dermatitis, providing rapid, significant, and durable improvements in skin signs, pruritus, and quality of life. Its safety profile is favorable versus conventional immunosuppressants, making it a first-line targeted therapy for inadequately controlled moderate to severe AD. Ongoing studies will further clarify its role in special populations and combination regimens.

REFERENCES

1. Beck, Lisa A., et al. "Dupilumab treatment in adults with moderate-to-severe atopic dermatitis." *The New England Journal of Medicine*, vol. 371, no. 2, 2014, pp. 130-139.
2. Halling, Andreas S., et al. "Real-world evidence of dupilumab efficacy and risk of adverse events in atopic dermatitis." *Journal of the American Academy of Dermatology*, vol. 85, no. 1, 2021, pp. 111-120.
3. Ghazal, Samar, et al. "Dupilumab is the first therapy to be approved for moderate-to-severe AD that does not respond to topical therapies based on large, randomized..." *BMC Dermatology*, vol. 22, 2022, pp. 54-63.
4. "Dupilumab for treating moderate to severe atopic dermatitis." National Institute for Health and Care Excellence (NICE), TA534, 2018.
5. Seegräber, Marlene, et al. "Dupilumab for treatment of atopic dermatitis." *Expert Review of Clinical Pharmacology*, vol. 11, no. 5, 2018, pp. 467-474.
6. "A Review of Phase 3 Trials of Dupilumab for the Treatment of Atopic Dermatitis." *American Journal of Clinical Dermatology*, vol. 23, no. 3, 2022, pp. 393-408.

© 2020 European Journal of Clinical Pharmacy; Volume: 2: Issue: 1| All Right Reserved