

# Efficacy of JAK inhibitors in the treatment of alopecia: A case report of 10 patients

Asmaa Lahrougui, Mariem Aboudourib, Layla Bendaoud, Ouafa Hocar, Said Amal

Department of Dermatology and Venereology, Mohammed VI university hospital-Marrakech-Morocco.

**Corresponding author:** Asmaa Lahrougui, MD, E-mail: [asmaa.lahrougui@gmail.com](mailto:asmaa.lahrougui@gmail.com)

## ABSTRACT

The efficacy of JAK inhibitors in the treatment of alopecia has been proven by numerous studies, yet the short- and long-term evolution remains unpredictable. We conducted a prospective study of 10 patients with different forms of alopecia, with two common denominators: failure to respond to any of the topical and systemic treatments for alopecia, treated with tofacitinib 11 mg/day for an average of thirteen months with complete regrowth in 80% of the patients, with only one case of no response to treatment. Long-term evolution showed three cases of relapse after three months of treatment discontinuation, with no side effects reported in any of the patients. Although JAK inhibitors have been shown to be effective in treating alopecia, their suspensory effect on the discontinuation of treatment is significant, hence the importance of informing the patient before initiating treatment.

**Key words:** Treatment efficacy, JAK inhibitors, Alopecia, Therapeutic response

## INTRODUCTION

The increasing incidence of alopecia in its various clinical forms and its impact on the patient's quality of life have highlighted the need for an effective and safer therapeutic option.

Particular interest has been shown in molecules that inhibit the JAK-STAT signaling pathway: JAK inhibitors. Their efficacy has been proven by numerous studies, yet the therapeutic response is person-dependent and, above all, unpredictable, with a significant suspensory effect.

Moreover, the use of JAK inhibitors is not without risk and may be subject to numerous side effects, hence the need to respect both the indications and contraindications of these molecules, as well as to perform rigorous clinical and biological monitoring.

## CASE REPORT

We conducted a prospective study on 10 patients with different forms of alopecia treated with tofacitinib 11 mg/day for an average of thirteen months.

The average age was 31.5, ranging from 10 to 55 years, with a female predominance (60%, n = 6).

Herein, we describe ten cases of alopecia, including 5 universal, 4 decalvating, and 1 plaque, with two common denominators: failure to respond to any of the topical and systemic treatments for alopecia, notably infiltrations, bolus and minipulses of corticosteroid therapy, weekly treatment with methotrexate, and the significant psychological impact.

Dermoscopy of all patients revealed black and yellow spots, as well as several downy hairs in places. The therapeutic decision was to treat the patients with tofacitinib 11 mg/day after a pre-therapeutic workup, which proved normal in all patients.

Clinical evolution was marked by partial hair regrowth at 6 months in 90% of the patients and complete regrowth between 12 and 13 months in 80%, with only one case of no response to treatment (Figs. 1 – 3).

**How to cite this article:** Lahrougui A, Aboudourib M, Bendaoud L, Hocar O, Amal S. Efficacy of JAK inhibitors in the treatment of alopecia: A case report of 10 patients. *Our Dermatol Online*. 2026;17(2):215-218.

**Submission:** 30.01.2025; **Acceptance:** 04.04.2025

**DOI:** 10.7241/ourd.20262.13



**Figure 1:** Initial appearance of patient 1 (a), partial regrowth after 6 months of treatment (b), total regrowth at 13 months (c).



**Figure 2:** Initial appearance of patient 2 (a), partial regrowth after 6 months of treatment (b), full regrowth at 13 months (c).



**Figure 3:** Initial appearance of patient 3 (ab), full regrowth at 13 months (cd).

Long-term evolution showed three cases of relapse after three months of treatment discontinuation, with no side effects reported in any of the patients.

## DISCUSSION

Alopecia is an autoimmune disease resulting from an attack on the hair follicle by autoreactive CD8 T

cells [1]. Interleukin 15 (IL-15), which is secreted by hair follicles, activates CD8 T lymphocytes via JAK1 and 3, which promote the secretion of interferon-gamma, which by binding with hair follicles via JAK-1 and JAK-2, generates greater secretion of IL-15 responsible for a vicious circle.

It would, therefore, seem that JAK inhibitors agents could interrupt the pathogenesis of alopecia by acting

on the hair follicle via JAK-1 and JAK-2, or by acting on T lymphocytes via JAK-1 and JAK-3 [2,3].

Among the JAK inhibitors most frequently used in the treatment of alopecia, that is, tofacitinib (JAK 1-2-3), baricitinib (JAK 1-2), and ruxolitinib (JAKS 1-3), topical forms are also available, notably, ruxolitinib cream 1.5% and tofacitinib cream 2% [4-6].

Treatment duration generally depends on the therapeutic response and individual tolerance, dosing varies according to the molecule. For ruxolitinib, the dose is 5–25 mg twice daily; for tofacitinib, the dose is 11 mg as a single dose or 5 mg twice a day; and for baricitinib, the dose is 4 mg/day [1,7].

Like all drugs, JAK inhibitors are not innocuous treatments, so it is essential to ask for a pre-treatment check-up to detect any contraindications, including a blood count, renal, liver, and lipid profiles, and serological tests.

JAK inhibitors are blamed for a multitude of side effects, including a higher incidence of common infections, notably upper respiratory tract infections, urinary tract infections, as well as an increased incidence of tuberculosis, shingles, and other opportunistic infections [8-10].

The risk of developing neoplasia, notably lymphoma and melanoma, has been incriminated by certain cohorts [11-13], there is also the possibility of developing toxidermia [1] or cardiovascular and thromboembolic diseases [1,14,15], as well as biological disturbances [1], hence the importance of conducting a check-up during the first month of treatment and then quarterly, including a CBC and liver, kidney, and lipid tests.

As with all immunosuppressive drugs, live attenuated vaccines are contraindicated; if they are necessary, they must be administered at least three weeks before the beginning of treatment, whereas all inactivated vaccines may be administered [1,16].

Although JAK inhibitors have been shown to be effective in treating alopecia [17], their suspensory effect on the discontinuation of treatment is significant, hence the importance of informing the patient before initiating treatment.

## CONCLUSION

The efficacy of anti-JAKs in the treatment of alopecia has been proven by numerous studies, yet the short- and long-term evolution remains unpredictable and, above all, person-dependent.

## Consent

The examination of the patient was conducted according to the principles of the Declaration of Helsinki.

The authors certify that they have obtained all appropriate patient consent forms, in which the patients gave their consent for images and other clinical information to be included in the journal. The patients understand that their names and initials will not be published and due effort will be made to conceal their identity, but that anonymity cannot be guaranteed.

## REFERENCES

- Damsky W, King BA. JAK inhibitors in dermatology: The promise of a new drug class. *J Am Acad Dermatol.* 2017;76:736-44.
- Xing L, Dai Z, Jabbari A, Cerise JE, Higgins CA, Gong W, et al. Alopecia areata is driven by cytotoxic T lymphocytes and is reversed by JAK inhibition. *Nat Med.* 2014;20:1043-9.
- Ghoreschi K, Jesson MI, Li X, Lee JL, Ghosh S, Alsup JW, et al. Modulation of innate and adaptive immune responses by tofacitinib (CP-690,550). *J Immunol.* 2011;186:4234-43.
- Craiglow BG, Tavares D, King BA. Topical ruxolitinib for the treatment of alopecia universalis. *JAMA Dermatol* 2016;152:490-1.
- Putterman E, Castelo-Soccio L. Topical 2% tofacitinib for children with alopecia areata, alopecia totalis, and alopecia universalis. *J Am Acad Dermatol.* 2018;78:1207-9.
- Bokhari L, Sinclair R. Treatment of alopecia universalis with topical Janus kinase inhibitors: A double-blind, placebo, and active controlled pilot study. *Int J Dermatol.* 2018;57:1464-70.
- Mackay-Wiggan J, Jabbari A, Nguyen N, Cerise JE, Clark C, Ulerio G, et al. Oral ruxolitinib induces hair regrowth in patients with moderate-to-severe alopecia areata. *JCI Insight.* 2016;1:e89790.
- Winthrop KL, Curtis JR, Lindsey S, Tanaka Y, Yamaoka K, Valdez H, et al. Herpes zoster and tofacitinib: Clinical outcomes and the risk of concomitant therapy. *Arthritis Rheumatol.* 2017;69:1960-8.
- Winthrop KL, Park SH, Gul A, Cardiel MH, Gomez-Reino JJ, Tanaka Y, et al. Tuberculosis and other opportunistic infections in tofacitinib-treated patients with rheumatoid arthritis. *Ann Rheum Dis.* 2016;75:1133-8.
- Adas MA, Alveyn E, Cook E, Dey M, Galloway JB, Bechman K. The infection risks of JAK inhibition. *Expert Rev Clin Immunol.* 2022;18:253-61.
- Maneiro JR, Souto A, Gomez-Reino JJ. Risks of malignancies related to tofacitinib and biological drugs in rheumatoid arthritis: Systematic review, meta-analysis, and network meta-analysis. *Semin Arthritis Rheum* 2017;47:149–56.
- Russell MD, Stovin C, Alveyn E, Adeyemi O, Chan CKD, Patel V, et al. JAK inhibitors and the risk of malignancy: A meta-analysis across disease indications. *Ann Rheum Dis.* 2023;82:1059-67.
- Furqan M, Mukhi N, Lee B, Liu D. Dysregulation of JAK-STAT pathway in hematological malignancies and JAK inhibitors for clinical application. *Biomark Res.* 2013;1:5.
- Xie W, Huang Y, Xiao S, Sun X, Fan Y, Zhang Z. Impact of Janus kinase inhibitors on risk of cardiovascular events in patients with rheumatoid arthritis: Systematic review and meta-analysis of

- randomised controlled trials. *Ann Rheum Dis.* 2019;78:1048-54.
15. Cohen SB, Tanaka Y, Mariette X, Curtis JR, Lee EB, Nash P, et al. Long-term safety of tofacitinib for the treatment of rheumatoid arthritis up to 8.5 years: Integrated analysis of data from the global clinical trials. *Ann Rheum Dis.* 2017;76:1253-62.
  16. Winthrop KL, Silverfield J, Racewicz A, Neal J, Lee EB, Hrycaj P, et al. The effect of tofacitinib on pneumococcal and influenza vaccine responses in rheumatoid arthritis. *Ann Rheum Dis.* 2016;75:687-95.
  17. Yan D, Fan H, Chen M, Xia L, Wang S, Dong W, et al. The efficacy and safety of JAK inhibitors for alopecia areata: A systematic review and meta-analysis of prospective studies. *Front Pharmacol.* 24;13:950450.

Copyright by Asmaa Lahrougui, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Source of Support:** This article has no funding source.

**Conflict of Interest:** The authors have no conflict of interest to declare.