

suppresses gonadotropin production. As our patient had a high testosterone level hyperprolactinaemia seems unlikely but we cannot rule it out. Along with melatonin, prolactin is a key regulator of seasonal hair growth in other mammals and, as pointed out by Langan and Paus, there is increasing evidence for involvement of prolactin in human hair growth. Once again a systematic clinical study would help to clarify a possible role for prolactin, perhaps comparing hair growth in the postpartum period in lactating and nonlactating women.

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Key words: hair loss, oestrogen, prolactin

Conflicts of interest: none declared.

Eyebrow regrowth in patients with frontal fibrosing alopecia treated with intralesional triamcinolone acetonide

DOI: 10.1111/j.1365-2133.2010.09994.x

MADAM, Frontal fibrosing alopecia (FFA) is a primary lymphocytic cicatricial alopecia which causes recession of the frontotemporal hairline.¹ Partial or complete eyebrow hair loss is seen in a majority of patients.^{2–9} Treatments are aimed at reducing symptoms and signs of disease and slowing disease progression, but rarely stimulate hair regrowth. The goal of this study was to retrospectively evaluate the benefit of intralesional triamcinolone acetonide in the treatment of eyebrow hair loss in patients with FFA.

Institutional Review Board approval was obtained to review the medical records of patients with a clinical diagnosis of FFA seen at the University of California San Francisco Hair Clinic over the 6-year period October 2003–September 2009. Patients with FFA with partial or complete eyebrow hair loss who received at least one treatment session with triamcinolone acetonide injections were included in the final study group. With the exception of one patient, all patients had a scalp biopsy showing a lymphocyte-predominant scarring alopecia that was consistent with a clinical diagnosis of FFA. Patient medical records were evaluated to identify basic demographic information (age, sex, menopausal status and ethnicity), current and prior treatments including number of eyebrow treatment sessions, eyebrow biopsy results (if available), and documentation of eyebrow regrowth or loss at follow-up.

Eyebrow injections were performed with triamcinolone acetonide at a concentration of 10 mg mL⁻¹, 0.125 mL per eyebrow. Systemic agents prescribed for FFA included oral doxycycline 100 mg twice daily, oral hydroxychloroquine 200 mg twice daily, and oral mycophenolate mofetil 500 mg twice daily for 1 month, then 1000 mg twice daily. Patients with frontotemporal recession also received topical treatment with minoxidil, tacrolimus 0.1% in Cetaphil® (Galderma, Lausanne, Switzerland) lotion, as well as triamcinolone acetonide injections to the receding hairline.

Forty patients with FFA were identified: of these, three (7.5%) had complete eyebrow hair loss and 28 (70%) had partial eyebrow hair loss. Ten women with partial eyebrow hair loss and one woman with complete loss (11 patients total) received eyebrow injections and comprised the study group (Table 1). Two of these patients (patients 3 and 10) had an eyebrow biopsy which showed a lymphocytic lichenoid infiltrate affecting the upper portions of the hair follicle and perifollicular fibrosis. Of note, the patients with FFA with eyebrow hair loss who did not receive injections (n = 20) did not experience eyebrow regrowth; four elected to have permanent eyebrow tattooing.

The 11 study patients received varying numbers of eyebrow treatment sessions with triamcinolone acetonide and at varying intervals. All patients concurrently received systemic therapy at the time of their first injection (Table 1). All patients with partial eyebrow hair loss (10 of 10) showed evidence of regrowing eyebrows at the first 3-month or 6-month follow-up appointment. At follow-up, two patients (patients 1 and 8) were sufficiently satisfied with the amount of regrowth after receiving 17 and two treatment sessions, respectively, that they ultimately discontinued injections; six patients (patients 3, 4, 5, 7, 9, 10) demonstrated moderate regrowth; two patients who demonstrated initial regrowth (patients 2 and 6) subsequently experienced slight eyebrow hair loss while continuing to receive injections. Patient 6 chose to continue injections despite the eyebrow loss. The eyebrow regrowth experienced by patient 9 was not complete and she elected to have eyebrow tattooing. Patient 11, who presented with complete eyebrow hair loss, had no regrowth after the first injection and did not continue corticosteroid injections. The

Table 1 Clinical parameters and treatment response in 11 women with frontal fibrosing alopecia with eyebrow hair loss

Patient	Degree of eyebrow loss	Age (years)	Duration of disease (years)	Menopausal status	Sequence of eyebrow and scalp hair loss	Systemic treatment for FFA (used during period of eyebrow injections)	Additional topical treatments to eyebrows	Number of eyebrow injection sessions (10 mg mL ⁻¹)	Is patient still receiving eyebrow injections?	Systemic treatment for FFA after completion of course of eyebrow injections	Documentation in patient records regarding eyebrow growth	Time delay for new eyebrow growth following first injection	Follow-up period
1	Partial	62	10	Post	Frontal → eyebrow	HCQ × 6 months, MMF × 6 months	TACRO ointment, MINOX	17 over 6 years	No	MMF × 6 months, HCQ × 6 months, MMF × 6 months	'Amazing growth of brows' (9 months)	First follow-up appointment (3 months)	Full regrowth; stable and not requiring injections × 1.5 years
2	Partial	64	2	Post	Concurrent loss	HCQ × 11 months, then no systemic treatment × 11 months		11 over 22 months	None × 4 years	None	'Impressive growth of brows' (6 months)	First follow-up appointment (6 months)	Some subsequent eyebrow loss with continued injections; no eyebrow injections × 4 years
3	Partial	45	2	Pre	Eyebrow → frontal	HCQ × 13 months, DOXY × 14 months		9 over 27 months	Yes	N/A (still receiving injections)	'Some growth' (1 month), 'improved' (7 months)	First follow-up appointment (1 month)	Eyebrows stable after 2 years on treatment; eyebrow injections continue
4	Partial	41	2	Pre	Eyebrow → frontal	HCQ × 4 months, DOXY × 6 months, then HCQ × 1 month		8 over 11 months	Yes	N/A (still receiving injections)	'Brows growing nicely' (3 months), 'excellent brow regrowth' (6 months)	First follow-up appointment (2 months)	Eyebrow regrowth with continued eyebrow injections
5	Partial	51	3	Post	Eyebrow → frontal	HCQ + MCN × 2 months, HCQ + MMF × 4 months, MMF × 9 months		6 over 15 months	Yes	N/A (still receiving injections)	'Growing'	First follow-up appointment (3 months)	Eyebrow regrowth with continued eyebrow injections
6	Partial	50	2	Post	Eyebrow → frontal	HCQ × 6 months	TACRO ointment	4 over 6 months	Yes	N/A (still receiving injections)	'Brows responding' (5 months)	First follow-up appointment (3 months)	Some new eyebrow loss noted; eyebrow injections continue
7	Partial	42	1.5	Pre	Eyebrow → scalp	DOXY	MINOX	3 over 5 months	Yes	N/A (still receiving injections)	'Brows ... have regrowth' (2 months)	First follow-up appointment (2 months)	3 appointments to date. Eyebrow injections continue
8	Partial	52	4	Post	Concurrent loss	HCQ × 3 months		2 over 3 months	No	HCQ × 20 months, MMF × 6 months, no systemic treatment × 6 months	'Brows have regrown' (3 months)	First follow-up appointment (3 months)	Full regrowth; stable and not requiring injections × 1.5 years
9	Partial	43	3	Post	Concurrent loss	HCQ		1	No	HCQ × 14 months	'Eyebrows are stable and fuller' (6 months)	First follow-up appointment (6 months)	Stopped eyebrow injections and tattooed eyebrows
10	Partial	40	1.5	Pre	Only eyebrows involved (no frontal scalp)	DOXY × 35 months		1	Yes	N/A (still receiving injections)	'New slightly pigmented sparsely growing hairs' (3.5 months)	First follow-up appointment (3.5 months)	Only two appointments to date. Eyebrow injections continue
11	Complete	67	2	Post	Eyebrow → frontal	HCQ		1	No	HCQ × 3 months	'No growth'	No growth at 6 months	No follow-up available

DOXY, doxycycline; FFA, frontal fibrosing alopecia; HCQ, hydroxychloroquine; MINOX, minoxidil; MCN, minocycline; MMF, mycophenolate mofetil; N/A, not applicable; TACRO, topical 0.1% tacrolimus.

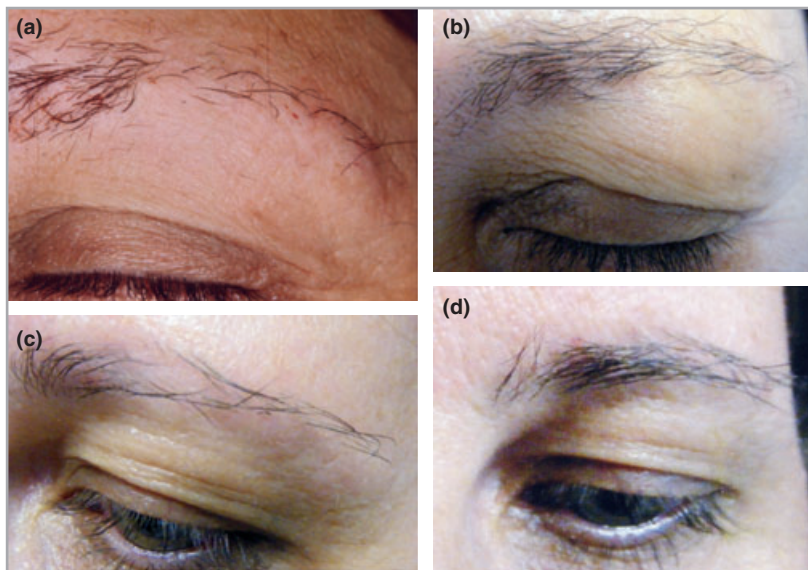


Fig 1. Eyebrow regrowth in patients with frontal fibrosing alopecia: (a, b) 45-year-old woman (patient 3 in Table 1) with eyebrow regrowth following nine injections of triamcinolone acetonide (10 mg mL^{-1}) over 27 months; (c, d) 41-year-old woman (patient 4 in Table 1) with eyebrow regrowth following eight injections of triamcinolone acetonide over 11 months. Systemic treatments for both patients included hydroxychloroquine and doxycycline.

treatment responses of patients 3 and 4 are shown in Figure 1. None of the 11 patients experienced atrophy from the corticosteroid injections.

Eyebrow hair loss is common in patients with FFA and approximately three-quarters of the 40 patients with FFA initially evaluated in our study had eyebrow loss. Despite being a common occurrence in FFA, only a few studies of FFA have evaluated the responsiveness of eyebrows to treatment.^{5,6,10} In our experience, it is uncommon for patients with FFA with eyebrow hair loss to experience eyebrow regrowth with systemic therapy alone. Thus, the eyebrow hair growth that was consistently observed following corticosteroid injections suggests that this therapy was responsible for the regrowth of the eyebrows.

The treatment of FFA is far from optimized. It is presumed that corticosteroid injections serve to suppress inflammation and therefore impede destruction of follicular stem cells and the sebaceous gland, and ultimately the destruction of the hair follicle. However, why eyebrow hair regrowth is marked in some patients and minimal in others and why hair regrowth is not typically seen as a feature of treatment of the frontotemporal hair line remain to be determined.

The small patient numbers and retrospective nature of this study are important limitations. Furthermore, it is difficult to document eyebrow response precisely without photographs. The development of a systematic means to document eyebrow hair loss and regrowth with both description and photographs will be important for future studies. Additional studies are also needed to determine the optimal frequency of eyebrow injections.

Acknowledgments

Travel support from the Canadian Dermatology Foundation (Dr Frederick Kalz Fund) to J.C.D. is gratefully acknowledged. This study received no external funding.

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Key words: alopecia, corticosteroids, eyebrow, frontal fibrosing alopecia, therapy

Conflicts of interest: none declared.