exposure even after subsequent initiation of radiotherapy and surgery. *JAAD Case Rep*. 2018;4:248-250.
2. Jayaraman SS, Rayhan DJ, Hazany S, Kolodney MS. Mutational landscape of basal cell carcinomas by whole-exome sequencing. *J Invest Dermatol*. 2014;134:213-220.
3. Sekulic A, Migden MR, Oro AE, et al. Efficacy and safety of vismodegib in advanced basal-cell carcinoma. *N Engl J Med*. 2012;366:2171-2179.
4. Chang AL, Oro AE. Initial assessment of tumor regrowth after vismodegib in advanced basal cell carcinoma. *Arch Dermatol*. 2012;148:1324-1325.
5. Eisenhauer EA, Therasse P, Bogaerts J, et al. New response evaluation criteria in solid tumours: revised RECIST guideline (version 1.1). *Eur J Cancer*. 2009;45:228-247.

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Ruxolitinib for the treatment of severe alopecia areata

To the Editor: Recent advances in our understanding of the pathogenesis of alopecia areata (AA)[1] have led to the use of Janus kinase (JAK) inhibitors for the treatment of AA.[2,3] There are considerably more data regarding the JAK1/3 inhibitor tofacitinib for treatment of AA than the JAK1/2 inhibitor ruxolitinib.[4,5] In an open-label study of 12 patients with moderate-to-severe AA, high-dose ruxolitinib was efficacious.[4] We present a series of 8 patients with severe AA treated with ruxolitinib and show that hair regrowth may be achieved at a lower dose.

From May 2015 through April 2018, 8 patients with severe AA (≥50% scalp hair loss), including alopecia totalis (AT) and alopecia universalis (AU), were treated with ruxolitinib monotherapy, 10 to 25 mg twice daily, for 5 to 31 months (mean 13.9, standard deviation [SD] 8.5). Of the 8 patients, 6 had been treated previously with tofacitinib for at least 4 months (mean, 11.3 [SD, 7.0]); of these, patients 4 and 8 underwent a 4- to 8-week washout before starting to take ruxolitinib whereas the other 4 patients switched directly to ruxolitinib. The mean duration of the current episode of AT or AU was 2.9 years (SD, 2.3; range, 0.5-5). Patient characteristics and treatment courses are detailed in Table I. Before undergoing treatment with ruxolitinib (or tofacitinib), patients were screened for *Mycobacterium tuberculosis* with use of the QuantiFERON-TB Gold test (Qiagen, Hilden, Germany), for human immunodeficiency virus, and for hepatitis B and C viruses. Before and during treatment, laboratory evaluation included a complete blood count with differential, complete metabolic panel, and fasting lipid panel.

Of the 8 patients, 5 achieved complete or near-complete regrowth of hair with ruxolitinib, with a mean improvement in Severity of Alopecia Tool

Table I. Patient clinical characteristics and treatment course

Patient	M/F	Age at start of therapy with either tofacitinib or ruxolitinib	AA or AT/AU	Current episode of AT/AU, y	SALT score before therapy with either tofacitinib or ruxolitinib	Total duration of tofacitinib therapy before ruxolitinib therapy, mo	Dose and duration of the higher dose of tofacitinib	Change in SALT score with tofacitinib therapy, %	Duration of ruxolitinib therapy, mo	Dose of ruxolitinib	Change in SALT score with ruxolitinib therapy, %
1	M	44	AT/AU	1	100	NA	NA	NA	21	25 mg bid	99%
2	F	18	AT/AU	5	100	NA	NA	NA	31	10 mg bid	100%
3	F	57	AT/AU	0.5	100	12	10 mg bid for 10 wk	60%	7	10 mg bid	100%
4	M	20	AA	NA	50	23	10 mg bid for 12 mo	92%	16	10 mg bid	99%
5	F	14	AT/AU	1	100	4	10 mg bid for 2 mo	0%	10	10 mg bid	91%
6	M	20	AT/AU	5	100	13	15 mg daily for 4 mo	0%	5	25 mg bid	0%
7	M	24	AA	NA	94	4	10 mg bid for 2 mo	0%	9	25 mg bid	0%
8	F	18	AT/AU	5	100	12	NA	60%	5	10-20 mg bid	−150%*

AA, Alopecia areata; *AT*, alopecia totalis; *AU*, alopecia universalis; *bid*, twice daily; *F*, female; *M*, male; *NA*, not applicable; *SALT*, Severity of Alopecia Tool.
*Negative percent change in SALT score indicates worsening of disease.

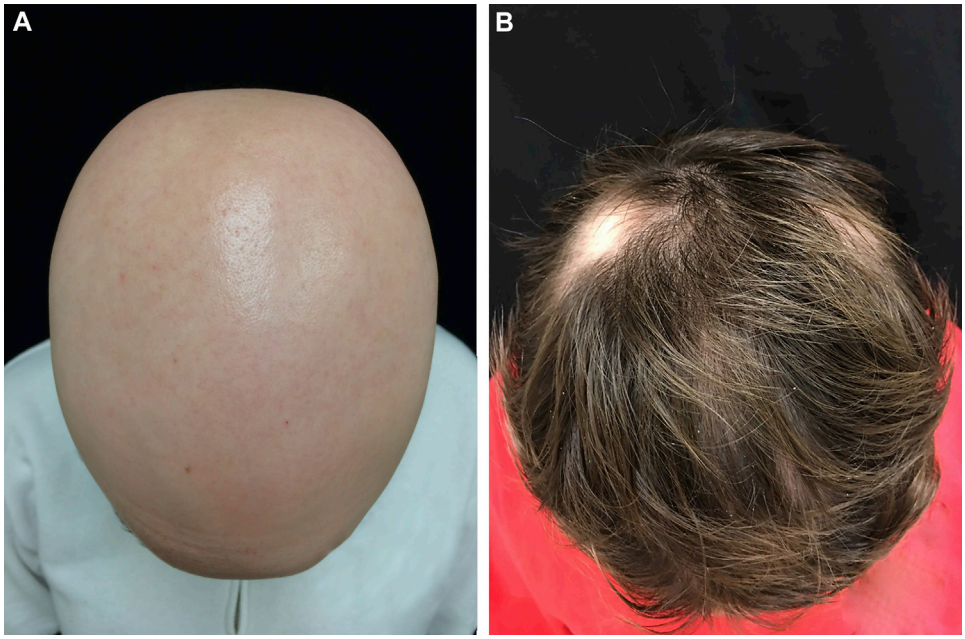

Fig 1. Top of the scalp of patient 5 after treatment with tofacitinib for 4 months (5 mg twice daily for 2 months followed by 10 mg twice daily for 2 months (**A**) and ruxolitinib (10 mg twice daily for 7 months) (**B**).

score of 98% (SD, 4%). Of these patients, 2 (patients 1 and 2) were never treated with tofacitinib, and 2 (patients 3 and 4) had previously achieved significant scalp hair regrowth only with high-dose tofacitinib (10 mg twice daily). Patient 5, who had not responded to high-dose tofacitinib (10 mg twice daily), achieved near-complete hair regrowth with ruxolitinib in a dose of 10 mg twice daily (Fig 1).

Of the 8 patients, 3 experienced no hair regrowth with ruxolitinib. Of these patients, 2 (patients 6 and 7) did not respond to either tofacitinib or ruxolitinib. Patient 8 achieved 60% regrowth with tofacitinib but stopped taking it because of adverse effects; she lost all of the hair growth during a subsequent trial of ruxolitinib.

The adverse effects of ruxolitinib were mild and included upper respiratory infections, weight gain, worsening of or development of new acne, easy bruising, and fatigue. One patient had a decrease in white blood cell count from 3800 white blood cells/μL to 3200 white blood cells/μL, which subsequently resolved.

Limitations of this study include the small number of patients and lack of a control group.

In this series, ruxolitinib was effective for 5 of 8 patients with severe AA, AT, or AU. Previously, high-dose ruxolitinib, 20 mg twice daily, was effective in 9 of 12 patients[4] and medium-dose ruxolitinib, 30 mg daily, was effective in 2 patients with severe AA.[5] In the present series, 4 of 5 patients who experienced hair regrowth did so with lower-dose ruxolitinib, 10 mg twice daily. Interestingly, patient 5 did not respond to high-dose tofacitinib but experienced complete regrowth with lower-dose ruxolitinib, and patient 8, who had a moderate response to tofacitinib, did not respond to ruxolitinib. The relative efficacy of JAK1/2/3 inhibition in AA treatment is not known. Several JAK inhibitors, including JAK1/2, JAK1—tyrosine kinase 2, and JAK3 inhibitors, are currently in clinical trials for AA (NCT03137381 and NCT02974868), and the results of these and other trials may help to address questions of relative efficacy and toxicity across the spectrum of JAK inhibitors.

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REFERENCES

1. Xing L, Dai Z, Jabbari A, et al. Alopecia areata is driven by cytotoxic T lymphocytes and is reversed by JAK inhibition. *Nat Med*. 2014;20:1043-1049.
2. Liu LY, Craiglow BG, Dai F, King BA. Tofacitinib for the treatment of severe alopecia areata and variants: a study of 90 patients. *J Am Acad Dermatol*. 2017;76:22-28.
3. Kennedy Crispin M, Ko JM, Craiglow BG, et al. Safety and efficacy of the JAK inhibitor tofacitinib citrate in patients with alopecia areata. *JCI Insight*. 2016;1:e89776.
4. Mackay-Wiggan J, Jabbari A, Nguyen N, et al. Oral ruxolitinib induces hair regrowth in patients with moderate-to-severe alopecia areata. *JCI Insight*. 2016;1:e89790.
5. Vandiver A, Girardi N, Alhariri J, Garza LA. Two cases of alopecia areata treated with ruxolitinib: a discussion of ideal dosing and laboratory monitoring. *Int J Dermatol*. 2017;56:833-835.

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Tofacitinib for the treatment of alopecia areata in preadolescent children

To the Editor: Alopecia areata (AA) is a common condition that often presents in childhood and is associated with a negative impact on health-related quality of life for both affected children and their caregivers.[1] Although treatment options for AA have historically been limited, Janus kinase (JAK) inhibitors have recently emerged as a pathogenesis-directed therapy. Two case series have demonstrated the use of oral tofacitinib for AA in children age 12 and older,[2,3] and although not as successful as systemic therapy, the use of topical JAK inhibitors for AA has also been reported in children as young as 4 years.[4,5] To our knowledge, there are no published studies of systemic JAK inhibitors for the treatment of AA in preadolescent children.

Here we present the cases of 4 pediatric patients (3 girls and 1 boy) age 8 to 10 years with alopecia totalis and alopecia universalis who were treated with oral tofacitinib. Their clinical characteristics and response to therapy are detailed in Table I. All 4 patients had previously failed multiple treatments before the initiation of tofacitinib therapy. Laboratory evaluation included a complete blood count with differential, comprehensive metabolic panel, and fasting lipid panel before treatment, after 4 weeks, and every 3 to

Table I. Patient characteristics and outcomes of treatment

Patient age, y	Age of onset, y	Sex	Weight, kg	AA subtype	Duration of current episode of AT/AU, mo	Autoimmune comorbidities	Prior therapies	Initial SALT score	Latest SALT score	Response of eyebrows/eyelashes	Tofacitinib dosage	Duration of therapy, mo
8	6	F	31	AU	17	Atopic dermatitis	Prednisone, TCS, ILTAC, cyclosporine, ustekinumab, PRP	100	0	Complete regrowth	5 mg bid	15
9	7	F	40	AU	7	Atopic dermatitis	TCS, tacrolimus ointment, tretinoin, minoxidil 5% solution	100	99	Minimal regrowth	5 mg daily × 3 mo, then 5 mg bid	7
9	5	F	41	AT	9	Atopic dermatitis, lichen sclerosus	Prednisone, TCS, ILTAC, tretinoin, DPCP	100	0	Eyebrows, >50%; eyelashes, complete regrowth	5 mg bid	6
10	5	M	42	AU	18	None	Prednisone, TCS, SADBE, NBUVB phototherapy, topical tofactinib	100	38	>50% regrowth of eyebrows and eyelashes	5 mg bid	6

AA, Alopecia areata; *AT*, alopecia totalis; *AU*, alopecia universalis; *bid*, twice daily; *DPCP*, diphenylcyclopropenone; *ILTAC*, intralesional triamcinolone; *NBUVB*, narrowband ultraviolet B phototherapy; *PRP*, platelet-rich plasma; *SADBE*, squaric acid dibutylester; *TCS*, topical corticosteroids.