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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.

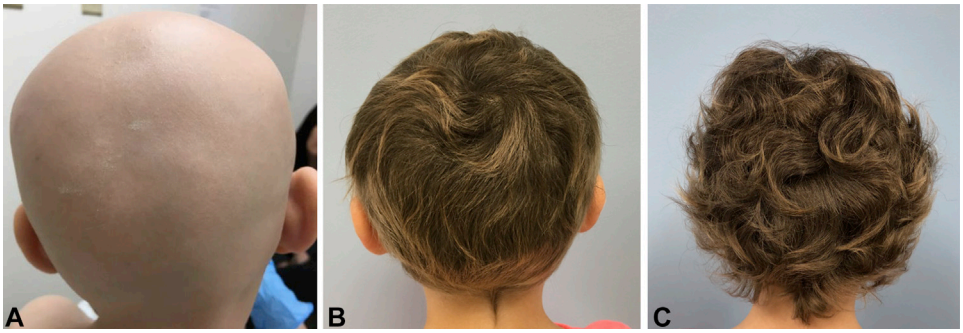

Fig 1. Response to treatment. Patient 1 at baseline (*left*), 6 months (*center*), and 9 months (*right*) of treatment with tofacitinib, 5 mg twice daily.

4 months thereafter. Baseline evaluation also included screening for *Mycobacterium tuberculosis* with use of the QuantiFERON-TB Gold test (Qiagen, Hilden, Germany) and screening for human immunodeficiency virus and hepatitis B and C.

Three patients were treated with tofacitinib, 5 mg twice daily, which is the standard dosing for adults and children weighing more than 40 kg in ongoing clinical trials for juvenile idiopathic arthritis (see later). The fourth patient (patient 2) began taking a dose of 5 mg once daily to see whether a lower dose might be sufficient to achieve regrowth, but when there was no improvement after 3 months, the dose was increased to 5 mg twice daily. Two patients demonstrated complete regrowth, 1 by 3 months of treatment (patient 3) and the other by 6 months (patient 1 [Fig 1]). A third patient (patient 4), who notably had previously used topical tofacitinib 2% cream to the eyebrow regions without response, had 62% regrowth at 6 months of treatment. The final patient (patient 2) had scant regrowth of terminal hairs (a Severity of Alopecia Tool score of 99) after 3 months of 5 mg once daily followed by another 3 months of 5 mg twice daily. No patient experienced abnormal laboratory test results or adverse events over the treatment period of 6 to 15 months. All 4 patients are still receiving tofacitinib.

Although presently there are no long-term safety data in the pediatric population, tofacitinib is undergoing clinical trials for juvenile idiopathic arthritis in children age 2 to 18 years (NCT02592434 and NCT01500551). On the basis of their weights, the dose of 5 mg twice daily that we used in our patients is consistent with the dosing in these clinical trials, except in the case of patient 1, who would have received 4 mg twice daily.

Although ours is a small series, the results presented here are favorable and corroborate those of prior larger studies in adolescents and adults. AA can be devastating at any age, but in our experience, childhood and adolescence represent particularly vulnerable periods for patients. We suggest that after proper counseling regarding the risks, including severe infection and malignancy, the use of tofacitinib may be considered for preadolescent children with AA who are experiencing psychosocial impairment.

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