Psoriasis is an immune-mediated disease characterized by formation of well-demarcated plaques with silver scale. Drugs such as cyclosporine and methotrexate can have deleterious side effects; however, biologic immune modifying agents now provide a safer alternative for psoriasis. Ustekinumab, an interleukin (IL) 12/23 inhibitor, is one such agent and is approved by the US Food and Drug Administration for the treatment of moderate to severe chronic plaque psoriasis. Vitiligo is an acquired autoimmune disorder resulting in depigmented patches of skin. Alopecia areata (AA) is another autoimmune disease that results in non-scarring hair loss. Current therapies for both conditions are limited, typically involving topical, intralesional, or systemic steroids.1 Because these traditional therapies are not sufficiently efficacious, new modalities including laser and biologic agents are being explored.2

CASE REPORT

A 39-year-old South Asian woman weighing 94 kg presented to our clinic in February 2016 with a several-year history of moderate generalized plaque psoriasis. In addition to psoriasis, she had a 1-year history of nonsegmental vitiligo of the face, scalp, and neck, and a 2-year history of patchy alopecia of the scalp. Her medical history was significant for asthma and penicillin allergy. She had no associated joint pain or personal history of other autoimmune disorder. Her family history was, however, significant for hypothyroidism. On physical examination, the patient had well-demarcated, erythematous, scaly plaques covering approximately 10% of her body surface area. She was also noted to have 3 well-demarcated, depigmented patches ranging in size from 2 to 4 cm on the face to 5 cm on the back of her scalp. Finally, the patient had significantly decreased hair density with several round patches of non-scarring hair loss ranging from 2 to 4 cm in diameter. These findings were consistent with 3 separate diagnoses: moderate chronic plaque psoriasis, vitiligo, and AA.

In the past, the patient had been treated with etanercept for her psoriasis with no improvement. For her vitiligo, she had received intralesional triamcinolone injections with only minimal improvement. For her AA, she had received intramuscular vitamin B complex injections, also with a poor clinical response. After explaining the benefits and risk, the patient consented to treatment with ustekinumab 90 mg subcutaneous injection, initially administered at 0 and 4 weeks. Subsequent doses were administered every 8 weeks. Dose selection was based on our experience with AA in a published study where 90 mg of ustekinumab every 8 weeks proved effective.3 Because of a lack of established protocols in the published literature for either condition, we opted for what worked for AA. No other adjuvant medications were used with ustekinumab. The patient showed significant improvement in erythema and scaling of psoriatic lesions by week 8 and complete resolution with body surface area 0% by week 16. In addition to the excellent response seen with her psoriasis, the patient showed impressive improvement in vitiligo and AA lesions of the
scalp (Fig 1). The vitiligo on her face and neck also improved. At week 20, hair density had visibly increased and repigmented macules were noted around the hair follicles in previously depigmented patches (Fig 2). The patient tolerated ustekinumab without adverse effects, and laboratory monitoring revealed no abnormalities.

DISCUSSION

Over the last few years, the number of therapeutic options for the treatment of plaque psoriasis has increased dramatically. Secondary to discoveries in the immunopathogenesis of the disease, different molecular targets, including tumor necrosis factor-alpha, ILs-12 and -23, IL-17, and others, have paved the way for targeted biologic therapies. On the contrary, vitiligo and AA have seen little success thus far in efficacious therapeutic options. Classically, these 2 entities have been treated with topical, intralesional, or systemic steroids. Recently, however, advances toward the development of biologic therapies for these 2 autoimmune diseases have been made.

The Janus kinase (JAK) pathway has been explored as a potential target for treatment of both vitiligo and AA. In several case reports, 1 open-label study, and 1 retrospective study, JAK inhibitors were shown to be effective for inducing hair regrowth in patients with AA. The efficacy of JAK inhibitors for AA is currently being investigated in clinical trials.
Similarly, JAK inhibitors show promise for the treatment of vitiligo. In a recently published report, a vitiligo patient quickly improved after receiving ruxolitinib, a drug that inhibits JAKs, which are important for immune cell signaling. The patient’s facial pigmentation improved from <1% to >50% in just 4 to 5 months.

While the pathogenesis of vitiligo and AA is not straightforward and likely involves a combination of genetic susceptibility and environmental factors, it is evident that proinflammatory cytokines play a role and can perhaps be targeted with the same therapies that have seen great success in psoriasis. The role of IL-23 in the immunopathogenesis of autoimmune disorders is complex. Genomic association studies have shown ILs-12 and -23 to be implicated in the pathway responsible for psoriasis; therefore, the 2 have been targets for drug development. These studies resulted in the discovery of ustekinumab, an IL-12/23 antagonist that has proven to be highly efficacious in treating plaque psoriasis. IL-23 is the cytokine responsible for proliferation and survival of T<sub>H</sub>17 cells, which represent an important T-cell subset in autoimmune disease beyond psoriasis. These disorders include Crohn’s disease, vitiligo, and AA.

As expected, our patient’s psoriatic lesions responded dramatically to ustekinumab. However, marked improvement was also noted in her vitiligo and AA. It is the striking increase in hair density and notable repigmentation that suggest IL-12/23 blockade is a promising therapeutic strategy for patients with these autoimmune conditions as well as psoriasis. It should be noted that the complex pathophysiology of these conditions means that ustekinumab may not have such robust response in all patients with vitiligo and AA. Two published studies had conflicting results on ustekinumab effectiveness in vitiligo and AA. However, the success seen in this patient with concomitant psoriasis, vitiligo, and AA should prompt consideration of ustekinumab in those for whom vitiligo and AA have proven refractory to other available treatments. Additional prospective studies will be required to determine the long-term safety and efficacy of ustekinumab in these populations.

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