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Alopecia Universalis and Chronic Graft-Versus-Host Disease Treated with Ruxolitinib

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Severe aplastic anemia (SAA) is a rare disease in which the bone marrow cannot produce adequate supplies of cells. A more recent and curative approach to treat SAA includes allogeneic hematopoietic stem cell transplantation (allo-HCT). Graft versus host disease (GVHD) is one of the most frequent complications and is associated with high morbidity and mortality.¹ In both its acute (aGVHD) and chronic (cGVHD) subtypes, GVHD manifests in multiple organs. cGVHD affects 30-70% of patients with an onset of 4-6 months after transplant.²

cGVHD's underlying pathophysiology has not been fully elucidated, but is often associated with immune dysfunction with many of the cutaneous and histologic features mimicking autoimmune diseases.³ It most commonly affects the skin and presents differently in different patients. Several case reports and small series have recognized vitiligo or alopecia areata, and the advanced form alopecia universalis, following allo-HCT.³ Regardless of organ manifestation, immunosuppression with corticosteroids is the foundation of treatment with sustained response rates of around 50% for each type of GVHD.³ Despite current research efforts, there is no clear recommendation for second-line or third-line therapy in those that are refractory to corticosteroids.

Report of a Case:

A man in his 40s, who received a matched-sibling peripheral blood allo-HCT more than 3 years prior, presented with an acute onset of hair loss on the head, under the arms, pubic area, and bilateral extremities. Additional symptoms included increased sweating, primarily in the scalp, scaly, red plaques that itch across the body, bruises on the abdomen

and bilateral lower extremities, generalized dry skin, and thin skin on the bilateral lower extremities.

The patient was being managed with topical desonide and clobetasol for his skin cGVHD with no improvement in hair loss. In addition to skin cGVHD, the patient also had liver cGVHD manifesting as elevated liver function tests (LFTs). Following initial presentation, dermatology was consulted and noted complete alopecia involving the scalp without inflammation of the hair follicles or scarring and greater than 90% loss of eyelashes. A dermatology consult referred to data on the use of ruxolitinib in alopecia areata and GVHD, but did not recommend treatment. A skin punch biopsy of the left lower leg was negative for cGVHD, but suggestive of psoriasis versus lichen simplex chronicus.

The primary transplant team decided to initiate low-dose ruxolitinib at 5 mg every 12 hours. Since initiation, the patient has been increased to 10 mg every 12 hours with improvement in his alopecia universalis, noting marked hair growth of the scalp and face as well as improvement of LFTs in the 10 months between initiation of therapy (Figure 1 & 2).

Discussion:

Ruxolitinib was originally approved by the US Food & Drug Administration (FDA) in 2011 for the treatment of myelofibrosis.⁴ Since then, ruxolitinib has been given breakthrough designation for aGVHD based on results from two studies, with one indicating overall response rates of greater than 80% in both aGVHD and cGVHD.^{5,6} In terms of alopecia universalis, the phenomenon is a rare manifestation of skin cGVHD and likely secondary to the long-term immune dysfunction with it more likely to occur in female-to-male sex mismatch allo-HCTs.³ While alopecia universalis is not life threatening, it is of serious psychologic concern and can negatively impact quality of life. This present case depicts not only a discernable improvement in hair growth, but also improvement in liver and skin cGVHD less than one year after initiation of ruxolitinib. Further studies are needed, but these findings suggest a role of ruxolitinib therapy in patients with cGVHD and alopecia universalis.

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References:

1. Presland RB. Biology of chronic graft-vs-host disease: immune mechanisms and progress in biomarker discovery. *World J Transplant*. 2016;6(4):608–619. [PubMed: 28058210]
2. Garnett C, Apperley JF, Pavl J. Treatment and management of graft-versus-host disease: improving response and survival. *Ther Adv Hematol*. 2013;4(6):366–378. [PubMed: 24319572]

3. Zou RC, Naik HB, et al. Risk Factors and Characterization of Vitiligo and Alopecia Areata in Patients With Chronic Graft-vs-Host Disease. *JAMA Dermatol.* 2015;151(1):23–32. [PubMed: 25207994]
4. Jakafi (ruxolitinib) [package insert]. Wilmington, DE: Incyte Corporation; 2014.
5. Zeiser R, Burchert A, Lengerke C, et al. Treatment of corticosteroid-refractory graft-versus-host disease with ruxolitinib in 95 patients. Presented at: 2016 ASH Annual Meeting; 125-8, 2015. Orlando, Florida; Abstract 858.
6. Khoury HJ, Kota V, Arellano Met al. Ruxolitinib as sparing agent for steroid-dependent chronic graft-versus-host disease (cGVHD). Presented at: 2016 ASH Annual Meeting; 125-8, 2015. Orlando, Florida; Abstract 1938.

Figure 1 –.
Alopecia universalis in a post-transplant patient with cGVHD
This figure depicts alopecia universalis in a post-transplant patient with cGVHD prior to initiation of ruxolitinib.

Figure 2 –.
Resolution of alopecia universalis in a post-transplant patient while on ruxolitinib
This figure depicts the resolution of alopecia universalis in a post-transplant patient 10 months post-initiation of ruxolitinib.