QL05

Hair Photography Project: Exploring the Clinical Course of Hair Thinning Associated With Teriflunomide

Keith R Edwards,[1] Lori Hendin Travis,[2] Annette Okai,[3] Scott Jackson,[4] Lisa Farnett,[5] Steve Cavalier,[5] Darren Stam,[5] Ken Liu[5]

[1]Multiple Sclerosis Center of Northeastern New York, Latham, NY, USA; [2]Phoenix Neurological Associates Ltd, Phoenix, AZ, USA; [3]Multiple Sclerosis Treatment Center of Dallas, Dallas, TX, USA; [4]Baton Rouge Clinic, Baton Rouge, LA, USA; [5]Genzyme, a Sanofi company, Cambridge, MA, USA

INTRODUCTION

- Teriflunomide is a once-daily oral immunomodulator approved for relapsing-remitting MS
- Efficacy of teriflunomide was consistently demonstrated on clinical (including disability) and MRI endpoints in placebo-controlled clinical trials, both in patients with relapsing forms of MS[1–3] and in those who experienced a first clinical episode suggestive of MS[4]
- A well-characterized and manageable safety and tolerability profile has been established based on clinical and postmarketing teriflunomide experience[1–5]
- With respect to tolerability, hair thinning has been reported as an adverse event (AE) in the clinical trial program
  - In the phase 3 TEMSO (NCT00134563) and TOWER (NCT00751881) trials, ~13% of patients receiving teriflunomide 14 mg experienced hair thinning compared with ~4% receiving placebo[2,3]
  - Across the pooled placebo-controlled trials of teriflunomide, hair thinning generally occurred in the first 6 months and resolved without corrective treatment while patients were on teriflunomide (median duration 135 days)[6]
  - Most cases were mild to moderate, and only 6% of patients who reported hair thinning discontinued teriflunomide treatment[6]
- Photographs of patients with self-reported hair thinning in a real-world setting could help healthcare professionals (HCPs) set expectations for their patients before initiating treatment with teriflunomide

OBJECTIVE

- To illustrate the clinical course of hair thinning in the small proportion of patients who experience this AE during treatment with teriflunomide

METHODS

- This observational, real-world project was performed in 9 MS centers in the United States between May 2013 and data cutoff in November 2014
- Patients with relapsing-remitting MS who reported hair thinning to HCPs during treatment with once-daily teriflunomide 14 mg or 7 mg were eligible for inclusion
- HCPs completed questionnaires with their patients at onset of hair thinning and again at a follow-up visit
  - Location and description of hair thinning were recorded
  - HCPs categorized event severity as mild, moderate, or severe
  - Patients ranked event severity from 0 (no hair thinning) to 10 (very severe hair thinning)
  - At follow-up, patients categorized the degree of improvement or resolution of hair thinning as follows: none/minimal, somewhat improved, markedly improved, complete/near-complete resolution
- Patients were photographed with a standardized protocol and camera from 5 standard views (anterior, posterior, left lateral, right lateral, and anterior superior) and an optional manipulated view with their hair pulled back

RESULTS

- Of the 31 patients who had completed follow-up visits at data cutoff, most were women (30/31), white (28/31), and had no prior history of hair loss (28/31). Many were receiving concomitant medications associated with hair thinning (21/31).[7,8] On average, patients were 51 years old
- Two patients were receiving teriflunomide 7 mg; all others were receiving teriflunomide 14 mg
- The mean time to onset of hair thinning was 81 days (<3 mo) after the first dose of teriflunomide. HCPs classified hair thinning as mild (19/31, 61%) or moderate (12/31, 39%), with a mean patient severity perception of 4.9/10 (**Table 1**)
  - **Figure 1** presents examples of hair thinning reported in this study
  - Patient and HCP perception of hair thinning severity were not always in agreement.
  - Hair loss was most commonly noticed by patients after they washed or brushed their hair
  - In some cases, the patient was first made aware of any degree of hair loss by their hairdresser or physician
  - The location of hair loss varied. It was often described as diffuse, with thinning reported on the sides of the head, around the hairline, or where the hair naturally parts
- On average, follow-up visits took place 268 days (~9 mo) after onset of hair thinning. Complete/near-complete resolution or marked improvement was reported by 26/31 patients (84%) at follow-up (**Table 1**)
  - Similarly, more hair thinning events were categorized as mild at follow-up (26/31, 84%) compared with onset
- There were 3 permanent patient treatment discontinuations: 1 due to gastrointestinal AEs, 1 due to an AE of rash (treated with steroids), and 1 due to AEs that included hair thinning. There were 2 temporary patient treatment discontinuations (<1 mo), 1 due to gastrointestinal upset and 1 due to personal choice

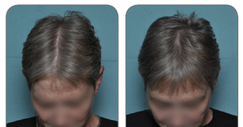
Figure 1. Examples of Hair Thinning at Onset and Follow-up

Onset / Follow-up

Age, y	49
Time from first dose to onset, d	114
Time from onset to follow-up, d	54

	Onset	Follow-up
Patient-perceived severity	1/10	1/10; markedly improved
HCP-perceived severity	Mild	Mild

- Patient did not notice hair loss
- Neurologist noticed thinning at top of scalp
- Continued teriflunomide treatment



Onset / Follow-up

Age, y	60
Time from first dose to onset, d	31
Time from onset to follow-up, d	237

	Onset	Follow-up
Patient-perceived severity	3/10	1/10; markedly improved
HCP-perceived severity	Moderate	Mild

- Patient reported more hair in the drain after showering and lots of hair in comb
- Continued teriflunomide treatment

Onset / Follow-up

Age, y	42
Time from first dose to onset, d	64
Time from onset to follow-up, d	244

	Onset	Follow-up
Patient-perceived severity	3/10	3/10; markedly improved
HCP-perceived severity	Mild	Mild

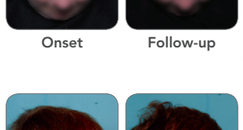
- Patient thought hair loss made her forehead appear larger
- Continued teriflunomide treatment

Onset / Follow-up

Age, y	49
Time from first dose to onset, d	12
Time from onset to follow-up, d	331

	Onset	Follow-up
Patient-perceived severity	5/10	1/10; complete/near-complete resolution
HCP-perceived severity	Mild	Mild

- Patient noticed hair loss in shower or in brush
- Continued teriflunomide treatment

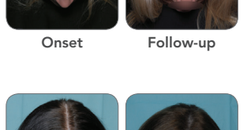


Onset / Follow-up

Age, y	58
Time from first dose to onset, d	132
Time from onset to follow-up, d	188

	Onset	Follow-up
Patient-perceived severity	5/10	2/10; markedly improved
HCP-perceived severity	Moderate	Mild

- Prior history of hereditary hair loss
- Patient could remove hair by running fingers through hair; hair on pillow, hairbrush, and in shower
- Continued teriflunomide treatment

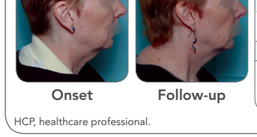


Onset / Follow-up

Age, y	44
Time from first dose to onset, d	30
Time from onset to follow-up, d	338

	Onset	Follow-up
Patient-perceived severity	7/10	1/10; complete/near-complete resolution
HCP-perceived severity	Moderate	Mild

- Subtle hair thinning seen ~1 month after starting teriflunomide treatment
- Patient developed diffuse red rash on scalp and chest
- Treatment discontinued due to rash

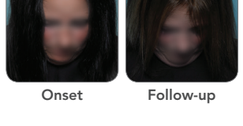


Onset / Follow-up

Age, y	60
Time from first dose to onset, d	31
Time from onset to follow-up, d	277

	Onset	Follow-up
Patient-perceived severity	7/10	7/10; somewhat improved
HCP-perceived severity	Mild	Mild

- Hair loss mostly on sides of head
- Continued teriflunomide treatment



Onset / Follow-up

Age, y	53
Time from first dose to onset, d	45
Time from onset to follow-up, d	228

	Onset	Follow-up
Patient-perceived severity	10/10	8/10; complete/near-complete resolution
HCP-perceived severity	Moderate	Moderate

- Patient reported significant hair loss after showering and combing hair
- Continued teriflunomide treatment

HCP, healthcare professional.

Table 1. Summary of Hair Thinning Adverse Events

		Patients (n=31)
Time from first dose of teriflunomide to onset of hair thinning, mean (range), d		81 (12–354)
Time from onset to follow-up visit, mean (range), d		268 (54–547)
	Onset Visit	**Follow-up Visit**
HCP perception of severity, n (%)		
Mild	19 (61)	26 (84)
Moderate	12 (39)	5 (16)
Severe	0	0
Patient rating at follow-up, n (%)		
Complete/near-complete	–	14 (45)
Markedly improved	–	12 (39)
Somewhat improved	–	4 (13)
None/minimal	–	1 (3)

HCP, healthcare professional.

CONCLUSIONS

- Consistent with observations from the teriflunomide clinical trial program, hair thinning events in our patients were usually mild and occurred within the first 3 months of treatment initiation, and most patients recovered fully while remaining on teriflunomide treatment
- As with any potential AE, it is important to ensure appropriate expectations through patient education in advance of treatment

REFERENCES

1. O'Connor et al. *Neurology*. 2006;66:894. 2. O'Connor et al. *N Engl J Med*. 2011;365:1293. 3. Confavreux et al. *Lancet Neurol*. 2014;13:247. 4. Miller et al. *Lancet Neurol*. 2014;13:977. 5. Vermersch et al. *Mult Scler*. 2014;20:705. 6. Leist et al. P2.203, AAN 2014. 7. American Hair Loss Association. http://www.americanhairloss.org/drug_induced_hair_loss/. Accessed Aug 21, 2014. 8. Micromedex. Truven Health Analytics Inc. http://www.micromedexsolutions.com/micromedex2/librarian/PFDefaultActionId/evidenceexpert.DoIntegratedSearch. Accessed Aug 21, 2014.

Acknowledgments

This poster was reviewed by Richard Able, PhD, and Larisa Miller, PharmD, of Genzyme, a Sanofi company. Editorial support for this poster was provided by Veronica Porkess, of Fishawack Communications, and was funded by Genzyme.

Disclosures

KRE: Consulting services (Biogen, Genzyme); speakers bureaus (Biogen, Genzyme, Novartis); research support (Biogen, Eli Lilly, Easai, Forum Pharmaceuticals, Genentech, Genzyme, Hoffman-La Roche, Novartis, Pfizer, Merz Pharmaceuticals, Vaccinex). **LHT:** Consulting fees (Acorda, Biogen Idec, EMD Serono, Genzyme, Novartis, Questcor). **AO:** Consulting fees (Bayer, Biogen Idec, EMD Serono, Genzyme, Questcor, Teva Neuroscience); research support (Genzyme, Novartis, Sun Pharma). **SJ:** No relationships to disclose. **LF, DS, KL:** Employees of Genzyme. **SC:** Employee of Genzyme, with ownership interest.

Disclaimer

Teriflunomide is approved in many countries, including the US and the European Union, for the treatment of relapsing multiple sclerosis or relapsing-remitting multiple sclerosis. This material may contain information that is outside of the approved labeling in some countries.

Presented at the Annual Meeting of the Consortium of Multiple Sclerosis Centers (CMSC), May 27–30, 2015, Indianapolis, IN, USA

Funding provided by Genzyme, a Sanofi company