Brief report

Low-level light therapy as a novel treatment for central centrifugal cicatricial alopecia: An interventional cohort study

The mechanism for hair growth using the Revian Red All LED Cap (RRLC) is via the 620-nm and 660-nm wavelengths increasing nitric oxide production in the scalp, inhibiting dihydrotestosterone, and decreasing inflammation.[1] This study aimed to determine if patients with central centrifugal cicatricial alopecia (CCCA), an inflammatory form of scarring hair loss primarily affecting women of African descent, had improvements in symptoms, reduction in hair loss and stimulation of hair growth with the RRLC.

Twenty-four women aged 18 to 65 years (mean 56.79 ± 10.87) with a clinical or biopsy-proven diagnosis of CCCA Stage II to IV were recruited for this prospective nonblinded, nonrandomized interventional study.[2] Subjects were on standard medical therapy or no treatment without changes for ≥3 months. Participants wore the RRLC once daily for 10 minutes over 6 months. Questionnaires and standardized clinical and trichoscopic photographs were collected at 0, 2, 4, and 6 months to assess symptoms and hair stabilization/regrowth. Photographs were reviewed independently by 2 board-certified dermatologists, and minor discrepancies were discussed to achieve a concordance rate of 100%. Baseline and completion photographs were also taken with a Canfield VISIA device (VISIA) to monitor pigmentation of the exposed forehead.

Using per-protocol analysis, data from 21 subjects were analyzed. All subjects were female and of African descent. Average disease duration was 11.75 + 8.27 years. Three of 24 (12.5%) subjects withdrew due to mild headache following usage (1), perceived lack of improvement (1), and loss to follow-up (1).

Baseline symptomatology (itch/burn/pain/scalp bumps) decreased in 11 (52%) patients. Six (28.5%) reported worsened symptomatology and 4 (19%) remained stable (P = .0468). Nine subjects (43%) reported hair regrowth and 6 (29%) reported stable disease following 6 months of treatment. One (4.7%) reported worsening hair loss and 6 (29%) were unsure.

On photographic assessment, 12 (57%) subjects had improved hair density, with 5 (23%) improving in CCCA stage (P = .017) (Figs 1 and 2). Eight (38%) had stable disease, with 2 slightly worsening before improvement. Two (9.5%) had overall worsened disease at the study endpoint. Importantly, these 2 subjects were not compliant with prescribed topical treatments.

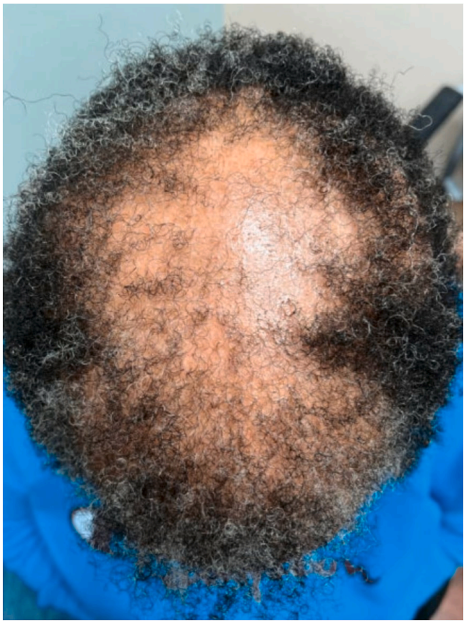

Fig 1. Coronal view of subject with CCCA stage 4 at baseline. *CCCA*, Central centrifugal cicatricial alopecia.

Trichoscopy demonstrated an overall (13; 61%) decrease in inflammatory signs, with less perifollicular scale (6; 28.5%), decreased perifollicular hyperpigmentation and erythema (13; 61%), increased vellus hairs (8; 38%), and less disruption of the honeycomb pigment network (1; 4.7%) (P = .0419). One subject (4.7%) had worsened perifollicular scale and 2 (9.5%) had worsened erythema. The remaining subjects had no change in their trichoscopic findings.

VISIA demonstrated an overall decrease in brown spots and "UV Spots", a VISIA-specific term referring to pigmented lesions consistent with sun damage. Final skin pigmentary assessments were completed during months of less sun exposure, suggesting possible seasonal pigment contribution.

This study highlights the adjuvant use of laser devices for scarring alopecias. Over half the subjects in this study experienced improvement in inflammation (61%), hair density (57%), and symptoms (52%). Limitations include the small sample size, lack of randomization, absence of a control group, and concomitant use of standard medical therapy and tension-inducing hairstyles.

Revian provided the RRLC which we distributed to patients.

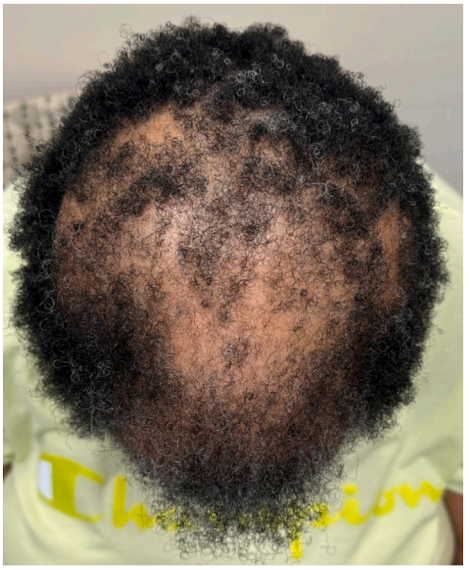

Fig 2. Improvement of subject in Fig 1 to CCCA stage 3 at study endpoint. *CCCA*, Central centrifugal cicatricial alopecia.

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Funding sources: None.

Patient consent: Consent for the publication of recognizable patient photographs or other identifiable material was obtained by the authors and included at the time of article submission to the journal stating that all patients gave consent with the understanding that this information may be publicly available.

IRB approval status: Reviewed and approved by Wake Forest University Institutional Review Board (IRB00094234).

Key words: central centrifugal cicatricial alopecia; low-level light therapy; red light therapy; scarring alopecia.

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Conflicts of interest

Dr McMichael has received research grants, royalties, and/or consulting support from a variety of companies, including Revian; Allergan; Almirall; Arcutis; Bioniz; Cassiopea; Concert Pharmaceuticals; Covance; eResearch Technology, Inc; Galderma; Incyte; Informa Healthcare; Johnson & Johnson; Keranetics; Lilly; Merck & Co, Inc; Pfizer; Proctor & Gamble; Samumed; and UpToDate. Authors Larrondo, Swain, Palmer, Obeime, Feaster, Lovell, and Rao have no conflicts of interest to declare.

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https://doi.org/10.1016/j.jaad.2025.09.047