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Emerging Therapeutic Strategies in Central Centrifugal Cicatricial Alopecia: A Review of the Clinical Trial Landscape

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INTRODUCTION

Central Centrifugal Cicatricial Alopecia (CCCA) is an irreversible primary scarring alopecia impacting up to 5.6% of Black women with significant diagnostic and therapeutic challenges.[1] This study aims to review the current clinical trial landscape for CCCA therapeutics.

The terms "Central Centrifugal Cicatricial Alopecia", "CCCA", and "scarring alopecia" were searched on ClinicalTrials.gov. Data was extracted for all clinical trials investigating CCCA interventions from 2005 to January 2025. Thirteen clinical trials were found and analyzed, encompassing 12 therapies for CCCA (Table 1). Six studies were marked as "complete" with published results on ClinicalTrials.gov or PubMed. Seven studies marked as "active" or "recruiting" had no results yet available.

Brepocitinib, a tyrosine kinase 2/JAK1 inhibitor significantly reduced clinical severity scores (*NCT05076006*).[3] Ritlecitnib, a JAK3 and tyrosine protein kinase inhibitor, resulted in greater improvement of scalp tissue at 24 weeks when compared to brepocitinib (*NCT05549934*).[3] In clinical trial *NCT03346668*, topical gabapentin improved physician-documented hair growth.[5]

Some trials didn't show improvement with the investigated treatment. In *NCT03521687*, while apremilast resulted in slight quality of life improvement, there wasn't significant hair loss improvement.[4] Similarly, microneedling (*NCT04342091*) and platelet-rich plasma (*NCT04472715*) didn't significantly improve alopecia severity scores or hair graft survival, respectively.[2,4]

The increasing number of CCCA clinical trials over the past two decades underscores a growing commitment to advancing targeted therapies and improving outcomes for patients with CCCA (Figure 1).

TABLE 1.

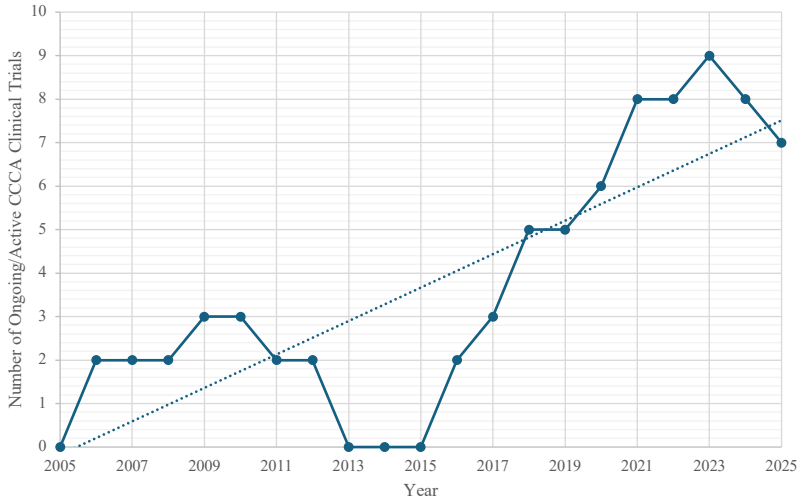
Summary of 13 Clinical Trials on CCCA Interventions from 2005- January 2025 as Described on Clinicaltrials.Gov.

NCT05076006	Brepocitinib monotherapy 45 mg QD vs placebo; 24 weeks	Complete	Brepocitinib downregulated CCL5 expression and significantly reduced clinical severity scores after 24 weeks, with continued improvement through week 48. Fibrotic marker expression worsened in placebo group.[3]
NCT05549934	JAK3/TEC inhibitor Ritlecitinib: 200 mg QD 8 weeks, then 100 mg QD 40 weeks	Active, preliminary results posted	At week 12, greater scalp tissue improvement with brepocitinib. By week 24, improvements were greater with ritlecitinib.[4] At week 24, both ritlecitinib and brepocitinib demonstrated improvement exceeding 100% in the lesional scalp transcriptome toward a non-lesional profile.
NCT03521687	Apremilast 30 mg BID	Complete, 15 patients	Mean change in Physician Global Assessment of Improvement at 24 weeks: 0.07. DLQI total score at Week 24 as compared to Baseline: -2.18. Mean change in Visual Analog Scale at Week 24: -1.94; Mean change in Central Hair Loss Grade at 24 weeks: -0.44.[4]
NCT03346668	Topical gabapentin 6% solution, 1mL BID; 12 weeks	Complete, 1 patient	Improvement of lymphocytic primary cicatricial alopecia symptoms, Lichen Planopilaris Activity Index scores, and physician documented hair growth by third visit. Significant reduction in symptoms; no effect on nerve fiber density or neuropeptide expression.[4]
NCT04472715	Follicular unit transplant vs. follicular unit extraction with PRP before/after transplant	Complete, 20 patients	Follicular unit extraction is preferred procedure with few side effects. PRP didn't significantly affect survival rate of hair grafts.[4]

TABLE 1. (CONTINUED)

Summary of 13 Clinical Trials on CCCA Interventions from 2005- January 2025 as Described on Clinicaltrials.Gov.			
NCT04342091	SOL Nova Device tattoo machine: One monthly microneedling session; 6 months	Complete, 5 patients	Change in skin appearance in treated area noted by investigators and participants with increased pinpoint bleeding. Microneedling didn't improve SALT score over six months in fibrosing alopecia subgroups.[4]
NCT05759338	Revian Red All LED cap QD; 6 months	Complete, no results posted	n/a
NCT04764331	Revian Red All LED cap QD for 6 months; 620 nm vs 660 nm	Recruiting	n/a
NCT05416333	Azelaic acid QD; 6 months	Recruiting	n/a
NCT04207931	Topical steroid + oral doxycyline + topical minoxidil vs Topical steroid + intralesional kenalog + topical minoxidil; 8 months	Recruiting	n/a
NCT03491267	Fractionated CO2 laser with/ without retinoic acid	Recruiting	n/a
NCT05460611	Sciton HALO 1470nm Non-ablative laser	Recruiting	n/a
NCT03078686	Emulsified adipose-derived tissue stromal vascular fraction + PRP vs. adipose-derived cellular stromal vascular fraction	Recruiting	n/a
NCT03078686	Emulsified adipose-derived tissue stromal vascular fraction + PRP vs. adipose-derived cellular stromal vascular fraction	Recruiting	n/a

FIGURE 1. Total number of ongoing/active registered clinical trials for CCCA per year.



DISCLOSURES

Dr Callender has served as an investigator, consultant, or speaker for Almirall, Aerolase, AbbVie/Allergan Aesthetics, Arcutis, Avava, Beiersdorf, Eirion Therapeutics, Eli Lilly, Galderma, Incyte, Janssen, Jeune Aesthetics, L'Oréal, Ortho Dermatologics, Pfizer, Prollineum, Regeneron, SkinBetter Science, SkinCeuticals, Symatese, Teoxane, UpToDate and Verademics. Miss Garg has no conflicts of interest or disclosures.

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