

Central Centrifugal Cicatricial Alopecia: Retrospective Case-Control Study of 54 Patients

Katherine Wang, BS¹, Thais Pincelli, MD², Dane Markham, BS¹, Launia White³, Zhuo Li, MS³, Olayemi Sokumbi, MD^{2,4}, Alison Bruce, MBChB²

¹Mayo Clinic Alix School of Medicine, ²Department of Dermatology, Mayo Clinic, ³Division of Clinical Trials and Biostatistics, Mayo Clinic, ⁴Department of Laboratory Medicine and Pathology, Mayo Clinic

ABSTRACT

BACKGROUND

Central centrifugal cicatricial alopecia (CCCA) is a common scarring alopecia affecting patients of predominantly African descent. Despite its high prevalence, CCCA is understudied, and its pathogenesis has not been fully characterized.

OBJECTIVE

The aim of this study is to analyze and report the incidence, clinical presentation, and management of CCCA at our institution.

METHODS

A retrospective chart review of 54 patients at our institution diagnosed with CCCA from 2000 to 2022, with comparison of this cohort to a control group of 270 patients with non-CCCA scarring alopecia.

RESULTS

Patients with CCCA were significantly more likely to report preceding use of high tension hairstyles (46.3% vs. 2.2%; $p < .0001$), heat-based styling tools (14.8% vs. 3.0%; $p = .0002$), and relaxers/perms/hair dyes (44.4% vs. 6.7%; $p < .0001$) compared to controls. They were also less likely to improve following treatment (31.5% vs. 59.6%; $p = .0004$). CCCA patients were more likely to report a family history of alopecia than controls (38.9% vs. 14.8%; $p = .0002$).

CONCLUSIONS

Use of high tension hairstyles, heat-based styling practices, and relaxer/perms/hair dyes may be associated with the development of CCCA.

INTRODUCTION

Central centrifugal cicatricial alopecia is a form of scarring alopecia that predominantly affects women of African descent. Clinically, it presents as patchy hair loss that originates on the vertex of the scalp and slowly expands centrifugally (**Figure 1**). Progressive scarring and fibrosis of hair follicles occurs.

With an estimated prevalence of 2.7 – 5.6% in Black women,^{1,2} it is among the most common types of scarring alopecia.

TABLE 1

Patient Characteristics	CCCA (n=54)	Controls (n=270)	P-value
High tension hairstyles	25 (46.3%)	6 (2.2%)	<.0001
Heat-based styling tools	8 (14.8%)	8 (3.0%)	.0002
Relaxers, perms, hair dyes	24 (44.4%)	18 (6.7%)	<.0001
Family history of alopecia	21 (38.9%)	40 (14.8%)	.0002
Improvement after treatment	17 (31.5%)	161 (59.6%)	.0004

METHODS

Patients aged 18 years or older with a diagnosis of CCCA and non-CCCA scarring alopecia were identified from the electronic medical record using International Classification of Diseases (ICD) codes. All patients had histopathologic confirmation of either CCCA or other scarring alopecia.

Patients' medical records and clinical photographs were reviewed. Information gathered included age, gender, race, ethnicity, disease duration, styling practices, if biopsy-proven disease, treatment, and outcomes.

For this study, "high tension hairstyles" included braids, extensions, tight ponytails, etc; "heating tools" included curling irons, flat irons, hot combs, etc. Styling practices were compared between the CCCA and non-CCCA groups using statistical analysis.

FIGURE 1



Female patient with CCCA displaying patchy hair loss on the vertex scalp.

RESULTS + DISCUSSION

A total of 324 patients were included: 54 with CCCA and 270 controls. Results are shown in **Table 1**.

In a cohort of 69 patients with CCCA, Shah and Alexis found that all patients had a history of high-risk styling practices, including high tension styles, chemical relaxers, and use of heated tools.³

Our findings reinforce the association between hairstyling practices and the development of CCCA and suggest that genetic factors (e.g., family history) may potentially play a role in disease pathogenesis.

CONCLUSIONS

- Patients with CCCA had significantly higher use of high tension hairstyles, heating tools, or chemical relaxants/perms/hair dyes compared to controls.
- High-risk hair styling practices, along with genetic factors, may contribute to disease pathogenesis.

REFERENCES

1. Khumalo NP, Jessop S, Gumedze F, Ehrlich R. Hairdressing and the prevalence of scalp disease in African adults. *Br J Dermatol.* 2007;157(5):981-988.
2. Olsen EA, Callender V, McMichael A, et al. Central hair loss in African American women: incidence and potential risk factors. *J Am Acad Dermatol.* 2011;64(2):245-252.
3. Shah SK, Alexis AF. Central centrifugal cicatricial alopecia: retrospective chart review. *J Cutan Med Surg.* 2010;14(5):212-222.