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Curl pattern classification: A potential tool for communication and risk stratification

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Hair and hair loss disorders lack adequate tools for quantitative assessment, impacting the quality of our care. Even though alopecia is among the top 10 conditions for which Black patients seek dermatologic care, many dermatologists are less familiar or confident with evaluation of hair loss in ethnic hair. For example, we do not utilize a widely accepted measure for hair texture, yet we do consider hair texture when evaluating our hair loss patients as it is relevant to hair fragility, shaft shape, and styling practices. This gap in objectivity likely lowers dermatologists' confidence and accuracy in addressing hair disorders in these patients.

The lay public has developed and widely adopted classification schemes for hair texture, often termed "curl pattern," enabling communication regarding optimal hair products and styling. These schemes have garnered significant publicity with frequent features in lifestyle and beauty magazines as well as social media. Additionally, hair care products reference curl patterns in their marketing.[1,2] As this is already widely accepted in curly hair communities, it is prudent to become familiar to augment patient-physician communication. With this pilot study, we aim to demonstrate that this classification scheme may also have utility as a risk-stratification tool in alopecia. Adoption of this tool could guide assessment, treatment recommendations, and patient compliance, yet remains underutilized in clinical practice.

We performed an institutional review board-approved, pilot survey study at New York University and Johns Hopkins University regarding female patients with a clinical and/or histopathologic diagnosis of androgenetic alopecia (AGA), traction alopecia, frontal fibrosing alopecia, central centrifugal cicatricial alopecia (CCCA), alopecia areata, or telogen effluvium. During a clinical encounter, consent was obtained and the provider determined the participant's curl pattern. Curl patterns were divided into pattern 1 (straight), pattern 2 (wavy), pattern 3 (curly), and pattern 4 (coily). Of note, the publicly

adopted curl pattern classification subdivides each of these categories further (Fig. 1).

A total of 74 participants were enrolled with 61 reporting ethnicity (43/61 = Caucasian, 9 = Hispanic, 8 = Black, 1 = Asian). Inclusion criteria required that the patients have clear clinical or histologically proven subtype of alopecia for a diagnosis to eliminate any discrepancies. Regarding alopecia subtypes of the 74 participants, 30/74 = frontal fibrosing alopecia, 25 = AGA, 7 = CCCA, 6 = telogen effluvium, 5 = alopecia areata, 1 = traction alopecia. Overall, the subtypes of alopecia are significantly different amongst the 4 curl patterns ($P = 0.011$) (Table 1), mostly between patterns 1 and 4 ($P = 0.0009$). Although AGA occurs with similar frequency across the 4 curl patterns, the risk of CCCA compared to AGA increases with increasing curl pattern ($P = 0.011$) (Table 1). Likewise, the study found that the distributions of alopecia types and curly hair patterns are significantly different between European or Caucasian patients and African or African American patients ($P = 0.0025$) (Tables 2 and 3). Curl pattern appears to be more significant than ethnicity in determining risk of associated alopecia subtype.

A limitation is the small sample size. However, our cohort does include all curl patterns and the proportions of Black and Hispanic participants enrolled are relatively reflective of the US population. A larger and more ethnically diverse cohort would enable better understanding of the relationship between curl pattern and ethnicity on alopecia. For example, we now acknowledge the genetic drivers in CCCA but have yet to parse out independent contributions of race/ethnicity versus hair texture.

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What is known about this subject in regard to women and their families?

- Dermatologists currently lack adequate tools for objective assessment in hair and hair loss disorders, which impacts women.
- Although we consider hair texture when evaluating hair loss patients as it relates to styling practices, hair health and treatment recommendations, we do not have a tool for categorization of hair texture.
- The public has adopted and widely utilizes "curl pattern" classifications for communication and marketing of products.

What is new from this article as messages for women and their families?

- We suggest dermatologists become familiar with curl pattern classification to optimize communication with our patients.
- Curl pattern classification may have predictive value in hair loss disorders and more work is needed to move towards its validation.
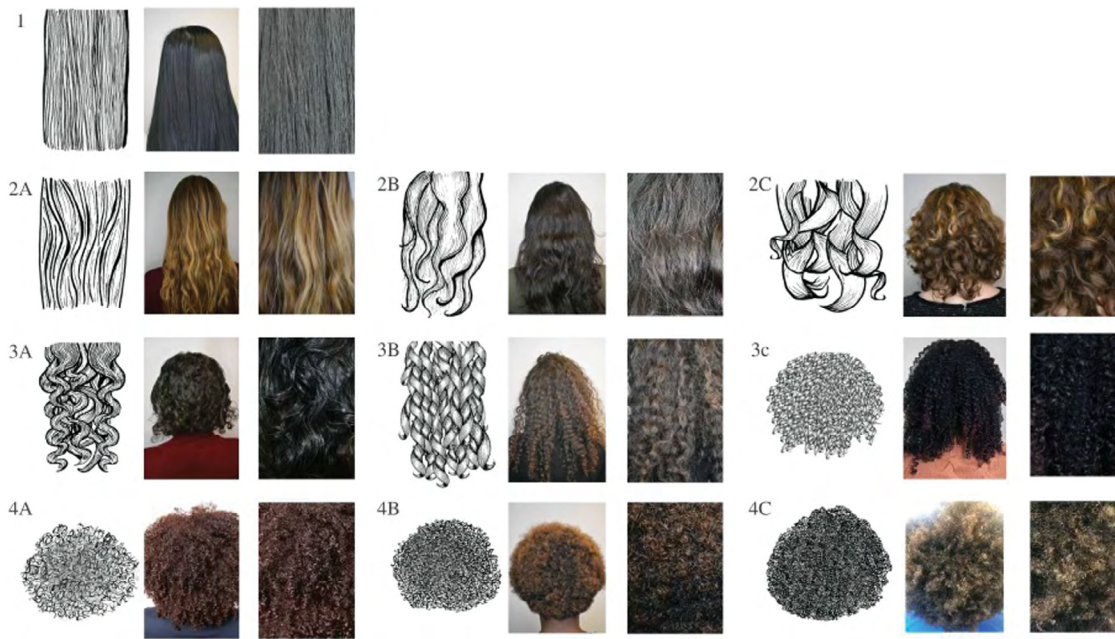
Fig. 1. Proposed curl pattern classification scheme.

Table 1.

Alopecia type and curl pattern

Curl pattern	(AGA), n (%)	(CCCA), n (%)	(FFA), n (%)	(TA), n (%)	(AA), n (%)	(TE), n (%)	Fisher exact test P
Pattern 1 (n = 17)	6 (35.3)	0 (0)	8 (47.0)	0 (0)	3 (17.7)	0 (0)	0.011
Pattern 2 (n = 37)	12 (32.4)	2 (5.4)	17 (46.0)	0 (0)	2 (5.4)	4 (10.8)	
Pattern 3 (n = 12)	4 (33.3)	1 (8.3)	5 (41.7)	0 (0)	0 (0)	2 (16.7)	
Pattern 4 (n = 8)	3 (37.5)	4 (50.0)	0 (0)	1 (12.5)	0 (0)	0 (0)	

AA, alopecia areata; AGA, androgenetic alopecia; CCCA, central centrifugal cicatricial alopecia; FFA, frontal fibrosing alopecia; TA, traction alopecia; TE, telogen effluvium.

Table 2.

Race and curl pattern

Race/ethnicity	Pattern 1 (straight), n (%)	Pattern 2 (wavy), n (%)	Pattern 3 (curly), n (%)	Pattern 4 (coiled), n (%)	Fisher exact test P
Hispanic or Latino (n = 9)	1 (11.1)	7 (77.7)	1 (11.1)	0 (0)	<0.0001
Asian or Pacific Islander (n = 1)	1 (100)	0 (0)	0 (0)	0 (0)	
European or Caucasian (n = 43)	14 (32.6)	22 (51.2)	6 (14.0)	1 (2.3)	
African, African American (n = 8)	0 (0)	1 (12.5)	1 (12.5)	6 (75.0)	

Table 3.

Race and alopecia types

Race/ethnicity	(AGA), n (%)	(CCCA), n (%)	(FFA), n (%)	(TA), n (%)	(AA), n (%)	(TE), n (%)	Fisher exact test P
Hispanic or Latino (n = 9)	3 (33.3)	1 (11.1)	4 (44.4)	0 (0)	0 (0)	1 (11.1)	0.043
Asian or Pacific Islander (n = 1)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	
European or Caucasian (n = 43)	12 (27.9)	1 (2.3)	21 (48.8)	1 (2.3)	4 (9.3)	4 (9.3)	
African, African American (n = 8)	5 (62.5)	3 (37.5)	0 (0)	0 (0)	0 (0)	0 (0)	

AA, alopecia areata; AGA, androgenetic alopecia; CCCA, central centrifugal cicatricial alopecia; FFA, frontal fibrosing alopecia; TA, traction alopecia; TE, telogen effluvium.

Dermatologists lack a widely adopted, objective classification scheme of curl pattern, while the lay public successfully navigates hair care practices using similar tools. This gap limits our objective assessment in the already challenging realm of hair loss disorders. The authors aim to introduce this visual tool to facilitate quality communication with patients. Additionally, the results of our pilot study suggest this classification may also have utility in risk stratification, as subtypes of alopecia, including CCCA, are statistically different amongst the 4 curl patterns. Ultimately, this tool has the potential to guide assessment and

facilitate patient-centered education and treatment, and we are hopeful future studies will move towards its validation.

Author contributions

LK: Study conception and design, draft manuscript preparation, data collection, analysis and interpretation of results; CA: Data collection, manuscript review; EP: Data collection; JT: Data collection; JBJ: Draft manuscript preparation; KLS: Study conception and design, analysis and interpretation of results; JS: Data collection

Conflicts of interest

None.

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Study approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

References

1. Here K, Growth H, Products H, et al. The Only Hair Typing System Article You'll Ever Need. [online] Curl Centric® | Rewrite the Rules of Natural Hair Care. 2018. Available from: https://www.curlcentric.com/hair-typing-system/. Accessed November 9, 2021.
2. Andre Walker Hair (n.d.). Hair Products for Natural and Black Hair. Retrieved November 22, 2021. Available from: https://andrewalkerhair.com/#andre-walker. Accessed January 5, 2018.