ORIGINAL ARTICLE

Hair pull test: Evidence-based update and revision of guidelines

Katherine A. McDonald, BScH,[a] Amanda J. Shelley, BScH,[a] Sophia Colantonio, MPH, MD,[a] and Jennifer Beecker, MD, CCFP(EM), FRCPC, FAAD[b]
Ottawa, Ontario, Canada

Background: The hair pull test lacks validation and has unclear pretest guidelines.

Objective: We sought to quantify normal hair pull test values and elucidate the effect of pretest hair washing and brushing. The impact of hair texture and lifestyle was also examined.

Methods: Participants (n = 181) completed a questionnaire recording demographics, medications, and hair health/history. A single hair pull test (scalp vertex) was performed.

Results: The mean number of hairs removed per pull was 0.44 (SD 0.75). There was no significant difference in the mean number of hairs removed regardless of when participants washed (P = .20) or brushed (P = .25) their hair. Hair pull test values were similar between Caucasian-, Asian-, and Afro-textured hair. There was no significant difference in hair pull values between participants taking medications affecting hair loss and participants not taking these medications (P = .33). Tight hairstyles did not influence hair pull test values.

Limitations: Participant hair washing and brushing could not be controlled during the study, but this information was documented and analyzed.

Conclusion: Normal values for the hair pull test should be reduced to 2 hairs or fewer (97.2% of participants). The current 5-day restriction on pretest hair washing can be reduced and brushing be made permissible. (J Am Acad Dermatol http://dx.doi.org/10.1016/j.jaad.2016.10.002.)

Key words: acute telogen effluvium; alopecia; alopecia areata; anagen effluvium; clinical examination; clinical guidelines; diagnosis; ethnicity; hair; hair loss; hair pull guidelines; hair pull test; hair texture; loose anagen syndrome; traction test; trichology.

Hair loss is a natural phenomenon that results in the shedding of up to 80 to 100 telogen hairs per day in a healthy adult.[1] If an adult experiences a severe increase in telogen hair loss, or the presence of anagen hair loss, it is often pathological.[2]

Hair loss disorders are ideally monitored using quick, noninvasive clinical examinations, such as the hair pull test. To perform this test, the clinician selects 50 to 60 hairs and holds the bundle close to the scalp between the thumb, index finger, and long finger.[3] The clinician then firmly pulls on the bundle using slow traction as the fingers slide down the hair shaft, avoiding a fast and forceful tug.[4] The hair pulls are performed at the vertex, 2 parietal areas, and the occipital area of the scalp.[5] Next, the pulled hairs are counted. Any broken hairs that were extracted from the bundle during the pull are discarded. If more than 10% of the hairs in each bundle are removed from a scalp area, the hair pull test is considered positive.[5] If fewer than 10% are removed, then the hair loss can usually be attributed to normal shedding.[6] If a test is positive in more than 1 scalp region, the clinician must consider telogen or anagen

From the University of Ottawa[a] and Division of Dermatology, Ottawa Hospital.[b]
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Reprint requests: Jennifer Beecker, MD, CCFP(EM), FRCPC, FAAD, Division of Dermatology, Ottawa Hospital, 1053 Carling Ave, Parkdale Clinic, Ground Floor East, Room 10, Ottawa, Ontario K1Y 4E9, Canada. E-mail: jbeecker@toh.on.ca.
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effluvium. Other hair disorders (ie, alopecia areata) may only have a positive hair pull test in the affected area.

The hair pull test is ideally used for monitoring the advancing edge of alopecia areata, acute cases of telogen effluvium, anagen effluvium,[7] and loose anagen syndrome.[8] The hair pull test is most effective when the patient has a severe condition and is in the acute phases of hair loss.[9] It is not advised to use the hair pull test for critical decisions when the patient has a more chronic condition (ie, chronic telogen effluvium) because of the test's low sensitivity and high interobserver variability.[9]

CAPSULE SUMMARY

- The hair pull is a quick clinical test used to monitor hair loss disorders.
- This study establishes evidence-based guidelines for the hair pull test.
- Hair washing and brushing can occur any time before the hair pull test; the updated normal hair pull test range is 2 or fewer hairs.

The hair pull test is commonly used despite the fact that the test lacks validation, strict pretest guidelines, and hair texture considerations. The purpose of this study was 3-fold.

First, this study aimed to validate and quantify normal hair pull test values using a large sample. Normal values with no citation or proof of validation have been propagated for decades in both research and clinical settings.

Second, the study evaluated the effect of pretest hair washing and hair brushing. Instructions given to patients before the hair pull test are inconsistent and could potentially impact the results. Currently, pretest shampooing guidelines are variable (ie, stop either 1[6] or 5[4] days before the test) and pretest brushing guidelines are not established. Standardizing these variables in clinical practice would regulate telogen hair removal before the test, and thus reduce interobserver variability.

Third, the study examined the normal range of hair pull test values considering hair texture. Previous research suggested that untreated human hair should be categorized based on hair density, diameter, shape, mechanical properties, and composition.[10] Hair shaft diameter, tensile strength, and hair moisture are decreased in Afro-textured hair, potentially impacting the normal values of a hair pull test. Further evidence suggests that Caucasian- and Asian-textured hair act similarly when strained compared with Afro-textured hair.[10] Therefore, the study intended to distinguish normal hair pull test values between non-Afro- and Afro-textured hair.

METHODS

The following study was designed to quantify the hair pull test. Pretest guidelines were evaluated and demographics, hair texture, and medications (Table I) were considered.

Participants

Informed consent was obtained from 182 volunteers, including men (n = 79) and women (n = 102). All participants were 18 years of age or older, as the hair pull test is designed for the postpubescent population.[11] The following factors did not exclude participants from the study, but were documented for analysis: chemically relaxed, dyed, or permed hair; previous diagnosis of a hair loss disorder (not active); postpartum; compulsive hair pulling; significant weight loss (>15 lb in the last 6 months); and medications with a suggested effect on hair loss. The Ottawa Health Science Network Research Ethics Board at the Ottawa Hospital approved this study.

Exclusion criteria

Those younger than 18 years were excluded from the study. Participants who had a weave, extensions, or dreadlocks were excluded because of ongoing traction and lack of hair shaft base accessibility. However, individuals who wore tight ponytails or cornrows (braids), considered to be moderate tension with accessibility, were included. Men with hair shorter than half an inch were excluded because of difficulty performing the hair pull test. Any individuals with a hair loss disorder at the time of testing were excluded. If known, the experimenters excluded a participant's immediate family members to avoid overrepresentation. Other exclusion criteria included current scalp infection, and chemotherapy with hair loss in the past 6 months. This information was collected in the questionnaire, and reviewed before performing the hair pull test.

Questionnaire

Before completing the hair pull test, all participants were asked to complete a brief questionnaire to determine demographics, hair texture, hair practices, and health.

Procedure

The majority of participants were recruited at MedGames in Sherbrooke, Quebec, Canada, including medical students across Canada. The study was explained to participants, consent was obtained,