Hair Density in African Americans

Leonard C. Sperling, MD

Background: The meager data on normal hair density in humans have been gathered from a predominantly white population. Examination of scalp biopsy specimens from African Americans suggests that hair density in this group may be lower than in whites. This study was performed to quantify any differences between white and African American patients.

Design: A retrospective case series of subjects who had undergone a biopsy of clinically healthy scalp skin. The 4-mm punch biopsy specimens were sectioned, and all follicles contained within the specimens were counted at various levels (suprabulbar, isthmus, and infundibulum) to arrive at the number and type of hairs present.

Setting: Outpatient clinic in a tertiary care medical center.

Patients: A consecutive sample of 22 African American and 12 white patients with clinically healthy scalp skin specimens that were studied and compared with previously reported data.

Main Outcome Measures: Patients' age and total number of follicles, terminal follicles, vellus follicles, terminal anagen hairs, and terminal telogen hairs.

Results: Total hair density (number of follicles per 4-mm punch biopsy specimen) and total number of terminal follicles and terminal anagen hairs were significantly lower in African Americans ($P < .001$) than in whites and in a previously reported, predominantly white, population.

Conclusions: Hair density in African Americans is significantly lower than that in whites, which must be taken into consideration when evaluating a biopsy specimen from an African American patient. Data previously collected from white patients may not provide adequate guidance when evaluating scalp biopsy specimens from African Americans and could lead to an incorrect diagnosis.

Arch Dermatol. 1999;135:656-658

Although the diagnosis of hair disease depends on the comparison of normal with abnormal findings, data on normal hair density are incomplete. After studying hundreds of scalp biopsy specimens from African American patients, I have observed that hair density tends to be lower in this racial group than in whites. Therefore, clinically and histologically normal hair density on biopsy specimens from African Americans would be labeled as abnormally low (ie, demonstrating alopecia) if existing data were to be applied. This study was performed to quantify any differences between white and African American patients.

RESULTS

The difference in sex ratios among the 3 patient groups is not statistically significant ($\chi^2$ test, $P = .34$). Data for male and female sex are not evaluated separately. There was a statistically significant difference in age among the 3 patient groups ($P = .02$); this was the result of the large difference (43.0 vs 31.7 years) between the historical controls and the African American group. The difference in the mean patient age between the white and African American groups (34.6 vs 31.7 years), as well as that between the white and historical controls (34.6 vs 43.0 years), was not statistically significant.

The mean number of total (terminal + vellus) follicles differed significantly ($P < .001$) among the 3 groups. Specifically, the number for African Americans (mean, 22.4) is significantly lower than the numbers for both the white patients and historical controls (mean, 35.5 and 39.8, respectively), but the difference between the mean numbers for whites and those for historical controls was not significant. The total number of terminal follicles and of terminal anagen follicles was the same as the total number of follicles, with a marked difference between those of African Americans and those of the whites combined with the historical control groups. There was no significant difference in the numbers of vellus follicles ($P = .10$) and terminal telogen follicles ($P = .21$) among the 3 groups, however (Table).

COMMENT

Hair disorders are common in African Americans. Scalp biopsy provides an objec-
PATIENTS AND METHODS

Scalp biopsy specimens were studied retrospectively. For a specimen to be included in the study, the following criteria were required: the specimen was from a 4-mm punch biopsy specimen, each biopsy specimen was known to have been taken from a portion of the scalp thought by a dermatologist to be clinically healthy (most had been submitted as a “normal control” specimen), there was no histological evidence of substantial inflammation (intense or subinflammatory) or scarring (hair follicles replaced by connective tissue), and demographic information (patient’s race, age, and sex) was available.

Specimens were sectioned according to a previously published method, and all follicles contained within the specimens were counted at various levels (suprabulbar, isthmus, and infundibulum) to arrive at the number and type of hairs present. Data on 12 whites, 22 African Americans, and a “historical control” group of 22 patients from a previously published report are presented in the Table.

Six separate analyses of variance, along with the Duncan Multiple Range Test for multiple comparisons, were performed for each of the variables evaluated: patient age and total number of follicles, terminal follicles, vellus follicles, terminal anagen hairs, and terminal telogen hairs. Data from African American patients were compared with those from the white group, the historical control group, and the combined white and historical control group. Data from the white group were also compared with those from the historical control group.

Some of the available data concerning normal hair density is based on studies using a ×60 magnification to count scalp surface hairs. Recent clinical trials evaluating the efficacy of drugs for treating common balding have used sophisticated photographic techniques to quantify hair density. Such methods are noninvasive, but the equipment and personnel required are impractical for routine clinical practice. Also, hair counts based on photographic methods do not allow for accurate subtyping of hair into phases of the hair cycle—anagen, catagen, and telogen.

The most practical way for clinicians to ascertain hair density in patients with alopecia is with transversely sectioned biopsy specimens. A single 4-mm punch biopsy specimen allows for the determination of not only hair den-
an accurate interpretation, scalp biopsy specimens from African Americans should be compared with healthy specimens from the same population. A failure to do so may lead to erroneous diagnoses. For example, end-stage traction alopecia—a disorder predominantly affecting African American adult women—is characterized by a decrease in the total number of hairs. This is accounted for by an abnormally low number of terminal hairs, which seemingly disappear without greatly affecting the dermal architecture. A biopsy specimen from unaffected scalp of an African American patient who had possible traction alopecia would contain about 18 terminal hairs (Figure 1). Because this figure is much lower than the average 30 terminal hairs found in whites (Figure 2), the erroneous conclusion might be that the number of hairs in the submitted specimen was abnormal, consistent with a diagnosis of traction alopecia.

Hair density in African Americans is significantly lower than that in whites. This must be taken into consideration when evaluating a biopsy specimen from a white African American patient. Data previously collected from white patients may not provide adequate guidance when evaluating scalp biopsy specimens from African Americans. My findings in white patients strongly support Whiting’s data as both accurate and representative of a white population.

Accepted for publication November 19, 1998.

David Cruess, PhD, Department of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, Md, performed the statistical analysis of data in this study.

The views expressed herein are those of the author and do not necessarily reflect the views of the US Army or US Department of Defense.

Corresponding author: Leonard C. Sperling, MD, Department of Dermatology, Uniformed Services University of the Health Sciences, 4301 Jones Bridge Rd, Bethesda, MD 20814 (e-mail: lsperling@mxc.usuhs.mil).

REFERENCES