

Assessment of hair density and caliber in Caucasian and Asian female subjects with female pattern hair loss by using the Folliscope

To the Editor: Clinical experience and past studies have suggested that Caucasian scalp hair is more dense than Asian hair, but at the same time the terminal hair fibers are thinner in average diameter.¹⁻⁴ However, most of these studies were done on a single ethnic group and did not involve a direct comparison between races within the study.

Few studies on hair density and thickness have utilized the Folliscope (LeadM Corp, Seoul, South Korea); most have relied on camera-based phototrichograms and manual analysis. The Folliscope is a small, simple USB-based apparatus that is easily portable and operated by means of a computer screen as an interface. Herein we endeavor to establish some practical baseline information on hair density and diameter of Asian and Caucasian female subjects with female pattern hair loss (FPHL) by using the Folliscope, which can be used practically within minutes in the hair specialist's clinic.

We recruited the subjects in this study from the University of British Columbia Hair Clinic based in the Vancouver General Hospital Skin Care Center, Vancouver, Canada. The subject had to be female and present with FPHL (stage I). At the conclusion of the study, a total of 32 Caucasian and 13 Asian FPHL patients had been recruited, 45 subjects in all. The mean age of the Caucasian group was 40.9 years (range, 17-73 years), whereas for Asians, the mean age was 37.5 years (range, 16-59 years). Some of the patients had not been treated for their FPHL, whereas some had been applying minoxidil for varying periods of time (range, 4 to 45 months). The two groups have been compared with their respective groups with respect to treatment. Six locations on the scalp were chosen for analysis by means of the Folliscope (3 in the frontal scalp, 3 in the occiput).

The subjects were separated into nontreatment groups and treatment groups and the results for the hair density and diameter measurements were

collected and analyzed. For the subjects who were not receiving treatment, the results are shown in Table I; those receiving treatment are shown in Table II. In summary, for both the treated and nontreated groups, Caucasian hair was significantly more dense than Asian hair in the occiput but not in the frontal scalp. However, in both frontal and occipital areas, Asian hair is thicker in diameter.

We were also interested in whether or not minoxidil made a difference in the density of the frontal hair since it is the only parameter that shows no significant difference between Caucasian and Asian subjects when they are segregated on the basis of treatment. Student *t* tests used to examine whether there were any statistically significant differences between minoxidil-treated groups and nontreatment groups revealed there was no statistical difference in frontal hair density measurements for both Caucasian ($P = .068$) and Asian groups ($P = .260$). Hence, it was reasonable to pool treatment and nontreatment groups to determine mean frontal hair density values. The pooled Caucasian samples had an average of 131.3 hairs per square centimeter and the pooled Asian samples had an average of 116.3 hairs per square centimeter, a statistically significant difference.

Bryan Shiu Lun Lee,^a Jung-Yi Lisa Chan, MD,^{a,b}
Assaf Monselise, MD,^a Kevin McElwee, PhD,^{a,c}
and Jerry Shapiro, MD^a

Department of Dermatology and Skin Science,
University of British Columbia, Vancouver, BC,
Canada,^a Cathay General Hospital, Taipei,
Taiwan,^b and Vancouver Coastal Health Re-
search Institute, Vancouver, BC, Canada^c

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Reprint requests: Jerry Shapiro, MD, Department of Dermatology and Skin Science, The University of

Table I. Summary statistics for hair density and diameter measurements in subjects not receiving treatment*

	Caucasian	Asian	P value
No. of subjects	22	7	
Frontal density (/cm ²)	126.8 ± 37.7	113.9 ± 27.5	.0749*
Occipital density (/cm ²)	140.4 ± 25.2	118.5 ± 31.7	.000802
Frontal hair diameter (μm)	65.1 ± 10.3	81.4 ± 16.5	2.95 × 10 ⁻⁷
Occipital hair diameter (μm)	66.0 ± 9.2	78.8 ± 16.6	1.22 × 10 ⁻⁵

Data shown are mean ± standard deviation. One-sided *P* values for the various comparisons between Caucasian and Asian subjects not receiving treatment. $P < .05$ is considered to be statistically significant.

*Not statistically significant.

Table II. Summary statistics for hair density and diameter measurements in subjects receiving minoxidil treatment

	Caucasian	Asian	P value
No. of subjects	10	6	
Frontal density (/cm ²)	141.3 ± 55.1	119.2 ± 23.4	.0568*
Occipital density (/cm ²)	153.6 ± 45.4	105.6 ± 19.3	5.15 × 10 ⁻⁵
Frontal hair diameter (μm)	60.5 ± 12.5	89.1 ± 13.7	1.24 × 10 ⁻⁹
Occipital hair diameter (μm)	59.5 ± 11.7	83.4 ± 12.4	1.32 × 10 ⁻⁸

Data shown are mean ± standard deviation. One-sided P values for the various comparisons between Caucasian and Asian subjects receiving treatment. P < .05 is considered to be statistically significant.

*Not statistically significant.

British Columbia, 835 West Tenth Ave, Vancouver BC, V5Z 4E8, Canada

E-mail: Shapiro@interchange.ubc.ca

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Thyroid dysfunction and cutaneous sarcoidosis

To the Editor: Sarcoidosis is a chronic inflammatory disorder of unknown etiology characterized by noncaseating granulomas causing infiltration and failure of multiple organ systems, including organs of the endocrine system.¹ Thyroid dysfunction, ranging from granulomatous infiltration of the thyroid gland to autoimmune-mediated thyroid disease, has been reported in association with systemic sarcoidosis. Clinically apparent thyroid disease has been reported in less than 1% to 2.9% of patients with sarcoidosis, and previous literature suggests that thyroid disease can develop at any time during the course of sarcoidosis.² Notably, autopsy results suggest a higher rate of thyroid infiltration, affecting approximately 5% of patients.³

Given the reported association of thyroid dysfunction and sarcoidosis, we performed an Institutional Review Board (IRB)–approved retrospective chart review of all outpatients with a

known diagnosis of cutaneous sarcoidosis seen by the Department of Dermatology in the University of Pennsylvania Health system between July 2008 and July 2010. We identified a total of 82 patients, 50 of whom had documented thyroid-stimulating hormone (TSH) levels (Table I). Both asymptomatic patients and patients presenting with symptoms consistent with thyroid dysfunction were included in the study. Upon analysis of these 50 patients, we detected a prevalence of thyroid disease (hypothyroidism or hyperthyroidism, with TSH values outside of the normal range) of 26% as compared with the national average of 9.9%.⁴ Of the patients with sarcoidosis who were tested, 20% were hypothyroid whereas 6% were hyperthyroid, with 86% of patients presenting with subclinical disease.

Thyroid disease is more prevalent in women overall, and in previous reports the incidence of thyroid disease in women with sarcoidosis is increased relative to that of men.² In our review, we found 26% of females and 25% of males tested were noted to have associated thyroid laboratory

Table I. Thyroid dysfunction in study population

Category/Variable	Euthyroid No. (%)	Hypothyroid No. (%)	Hyperthyroid No. (%)
Gender			
Male	6 (75)	2 (25)	0 (0)
Female	31 (74)	8 (19)	3 (7)
Ethnicity			
Caucasian	5 (45)	6 (55)	0 (0)
African American	28 (82)	3 (9)	3 (9)
Other*	4 (80)	1 (20)	0 (0)
Age (y)			
21-40	2 (50)	1 (25)	1 (25)
41-60	31 (84)	4 (11)	2 (5)
61-80	4 (44)	5 (56)	0 (0)

*Other includes Asian, Hispanic, and not specified.