Clinical Diagnosis of Hirsutism in Thai Women

Sopon Cheewadhanaraks MD*,
Krantarat Peeyananjarassri MD*, Chainarong Choksuchat MD*

** Department of Obstetrics and Gynecology, Faculty of Medicine, Prince of Songkla University*

Objective : *To determine the cutoff score for identifying hirsute Thai women, by using modified Ferriman-Gallwey-Lorenzo (mF-G-L) method.*
Material and Method : *Hirsutism was defined as an amount of terminal hair in the androgen-sensitive skin areas that the women themselves would consider obviously abnormal, and their mF-G-L score was above 97.5 percentile of general population. The subjects were consecutive unselected premenopausal women who came to our hospital for their yearly Papanicolaou smear check up, without any complaint. Acne and oily skin were also assessed.*
Results : *Five hundred and thirty-one women underwent a physical exam. The women who had the total hair-growth score of 0, 1 and 2 by mF-G-L method accounted for 97.8% of all the subjects. All of the 11 subjects with a total score of 3 or more considered themselves to have excessive growth of hair. None of these 11 women had acne.*
Conclusion : *The authors purposed that the cutoff score to diagnose Thai hersutism may be 3 or more by mF-G-L method.*

Keywords : *Diagnosis, Hirsutism, Thai*

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About 69% of Caucasian patients with androgen excess present with hirsutism[1]. In contrast, many investigators have noted that East Asian women with androgen excess rarely demonstrate hirsutism[2-4]. Thus, among East Asian women the absence of hirsutism cannot be used to exclude the presence of a hyperandrogenic disorder[5]. In general, East Asian men and non-hirsute women have less terminal hair than Caucasians[6]. Therefore, the previous studies mentioned above, determining hirsutism by modified Ferriman-Gallwey-Lorenzo (mF-G-L) method[4,7,8] and using cutoff score of Caucasian women, might underestimate the prevalence of hirsutism among East Asian patients.

However, hirsutism was significantly more severe in South Asians with polycystic ovary syndrome (PCOS) than Caucasian patients[9]. It seems that Asian patients in different regions of Asia have considerably varied amount of terminal hair. The purpose of this study was to determine the cutoff score for identifying hirsute Thai women, people from Southeast Asia, by using mF-G-L scoring system.

Correspondence to : Cheewadhanaraks S, Department of Obstetrics and Gynecology, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkla 90110, Thailand. Phone & Fax: 0-7442-9617, E-mail: csophon@medicine.psu.ac.th

Material and Method

The authors defined hirsutism as an amount of terminal hair in the androgen-sensitive skin areas that the women themselves would consider obviously abnormal, and their mF-G-L score were above 97.5 percentile of general population. The subjects were consecutive unselected premenopausal women who came to Songklanagarind hospital for their yearly Papanicolaou smear check up, without any complaint. The subjects had menarche at least 8 years before. The exclusion criteria were previously known chronic diseases, pregnancy, or history of drug taking. These drugs included danazol, gestrinone, androgens, oral progestins, anticonvulsants, antihypertensives, adrenocorticotropic hormone, prednisolone, dexamethasone, gonadotropin-releasing hormone agonists, ketoconazole, hexachlorobenzene, spironolactone, penicillamine, diazoxide, cyproterone acetate, flutamide, cimetidine, finasteride, oral contraceptives,

injectable progestin contraceptives, and progestin implants. Informed consent was obtained from all women.

These women's opinion about their body hair was sought. Practice of mechanical depilation including plucking, waxing, shaving, electrolysis, and laser hair removal was elicited. The medical, menstrual, and obstetric history were sought. Their ethnic subgroups (Thai-Thai, Chinese-Thai, Muslim-Thai) were also elicited.

All subjects underwent a physical exam by the same investigator (K.P.). According to mF-G-L scoring system[4], the nine body areas containing androgen-sensitive hair of these women were graded from 1 (minimal terminal hair) to 4 (frank virilization), and the grades of each of these areas were summed. Moreover, signs of frank virilization, including male pattern alopecia, clitoromegaly, deepening of voice, and increased muscle mass, were evaluated.

Acne and oily skin were also assessed. Acne was graded according to the concensus conference on acne classification[10]. However, only open or closed comedones with no inflammatory lesions was defined as having no acne. Oily skin was defined as skin with excess sebum throughout the entire face, particularly through the T-zone (forehead, nose and chin) which could look shiny after cleansing. Body mass index (BMI) of each woman was calculated. Menstrual cycle lengths shorter than 21 days and longer than 35 days were considered abnormal.

Statistical analyses were performed using Student's t-test, Chi-Square test and Kruskal Wallis test. P-value < .05 was considered statistically significant.

Results

Five hundred and thirty-one women underwent a physical exam. The age distribution is presented in Table 1, and parity in Table 2. Five hundred and seven (95.5%) of all the women had normal menstrual interval. The BMI of all the subjects were 22.8 ± 3.6 (mean $\pm$ SD) Kg/m^2. One of the women practiced shaving off her moustache.

The women who had the total hair-growth score of 0, 1 and 2 by mF-G-L method accounted for 97.8% of all the subjects (Table 3). None of the women had the total score above 5. All of the 11 subjects with a total score of 3 or more, and 2 of 10 women with a total score of 2 considered themselves to be hirsute. Table 4 shows the distribution of hair-growth gradings at nine body areas. Terminal hair was most often found at the lips. None of the women had signs of virilization.

Table 1. Age distribution of the women (n = 531)

Age (years)	n (%)
20-30	155 (29.2)
31-40	213 (40.1)
41-50	163 (30.7)

Table 2. Parity of the subjects (n = 531)

Parity	n (%)
0	114 (21.5)
1	108 (20.3)
2	188 (35.4)
≥ 3	121 (22.8)

Table 3. Prevalence of the total score by modified Ferriman-Gallwey-Lorenzo method (n = 531)

Total hair-growth score	n (%)
0	468 (88.1)
1	42 (7.9)
2	10 (1.9)
3	3 (0.6)
4	4 (0.8)
5	4 (0.8)
≥ 6	0 (0)

Table 4. Distribution of hair-growth gradings at nine body areas

Body area	Gradings				
	0 n(%)	1 n(%)	2 n(%)	3 n(%)	4 n(%)
Lip	494 (93.0)	36 (6.8)	1 (0.2)	0	0
Chin	530 (99.8)	0	1 (0.2)	0	0
Chest	529 (99.6)	1 (0.2)	1 (0.2)	0	0
Upper back	529 (99.6)	2 (0.4)	0	0	0
Lower back	528 (99.4)	3 (0.6)	0	0	0
Upper abdomen	525 (98.9)	6 (1.1)	0	0	0
Lower abdomen	513 (96.6)	17 (3.2)	1 (0.2)	0	0
Arm	517 (97.4)	14 (2.6)	0	0	0
Thigh	513 (96.6)	16 (3.0)	2 (0.4)	0	0

The total hair growth score of all the subjects was 0.20 ± 0.69 (mean ± SD). The total score of Thai-Thai ethnic subgroup was 0.21 ± 0.66, Chinese-Thai 0.19 ± 0.80, and Muslim-Thai 0.17 ± 0.72. There was no statistically significant difference between ethnic subgroups, using Kruskal Wallis test. Table 5 shows the women of each ethnic subgroup having a total score of 2 or less compared with 3 or more. There was no significant difference, as well.

Acne was found in 30 subjects (5.6%); 28 women were classified as having mild degree and 2 women having moderate degree. Surprisingly, none of the women with hair-growth score of 3 or more had acne (Table 6). Oily skin was very common, 325 women (61.2%) had oily skin. There was no correlation between total hair-growth score and oily skin (Table 7). The BMI of the women with hair-growth score of 3 or more were similar to the women with a score of 2 or less (21.6 ± 4.0 versus 22.8 ± 3.5). The abnormal menstrual intervals of the women with hair-growth score of 3 or more were significantly more prevalent (Table 8).

Table 5. Total hair-growth score of ethnic subgroups

Total hair-growth score	Thai-Thai (n = 407) n (%)	Chinese-Thai (n = 70) n (%)	Muslim-Thai (n = 54) n (%)
0-2	399 (98.0)	68 (97.1)	53 (98.1)
≥ 3	8 (2.0)	2 (2.9)	1 (1.9)

P-value = 0.88

Table 6. Correlation between total hair-growth score and presence of acne

Total hair-growth score	Acne	
	No n(%)	Yes n(%)
0-2	490 (97.8)	30 (100)
≥ 3	11 (2.2)	0

P-value = 0.41

Table 7. Correlation of total hair-growth score with oily skin

Total hair-growth score	Oily skin	
	Positive n(%)	Negative n(%)
0-2	318 (97.8)	202 (98.1)
≥ 3	7 (2.2)	4 (1.9)

P-value = 0.87

Table 8. Correlation of total hair-growth score with interval of menstrual cycle

Total hair-growth score	Interval of menstrual cycle	
	Normal n(%)	Abnormal n(%)
0-2	503 (99.2)	17 (70.8)
≥ 3	4 (0.8)	7 (29.2)

P-value < .001

Discussion

In the majority of patients, hirsutism should be considered as a sign of androgen excess conditions e.g. PCOS, androgen-secreting tumor, nonclassic adrenal hyperplasia (NCAH). The exception is possibly those patients with idiopathic hirsutism, defined by the presence of significant hirsutism in the absence of both ovulatory dysfunction and hyperandrogenemia[11,12] Thus, hyperandrogenemia is not the gold standard for diagnosis of hirsutism. For this reason, the authors defined hirsutism as an amount of terminal hair in the androgen-sensitive skin areas that the women themselves would consider obviously abnormal, and their mF-G-L score was above 97.5 percentile of general population.

Adequate co-operation in a study of this nature among community-based women is unlikely. Then, the authors decided to study consecutive unselected women who came to Songklanagarind hospital for their yearly Papanicolaou smear check up, without any complaint. This series would give sufficient representatives of general population for the purpose of this study. The distribution of age, parity, menstrual interval and BMI of the women in the present study showed that these subjects seemed to be appropriate representatives. Since clinical assessment of body hair growth is a relatively subjective process, all of the subjects underwent a physical exam by the same investigator, in order to minimize the variation of the outcome.

Various investigators used mF-G-L method to quantify body hair growth in Caucasian women. The exact numerical cutoff score used to define hirsutism varied in these previous studies, from 6 or more to 8 or more[3,4,11,13]. Knochenhauer et al[13] reported that 7.6%, 4.6% and 1.9% of 369 consecutive women, examined at the time of preemployment physical

exam, demonstrated a mF-G-L score of 6 or more, 8, or 10, respectively. In the present study, the authors found that the women who had the total score of 0, 1 and 2 by mF-G-L method accounted for 97.8% of all subjects. All of the 11 (2.2%) subjects with a total score of 3 or more considered themselves to have excessive growth of hair. So it was purposed that the cutoff score to diagnose Thai hirsutism may be 3 or more by mF-G-L method. Our data seemed to show that ethnic subgroups of Thai women did not have any influence on the cutoff score.

Acne is one of the important signs of androgen excess. Slayden et al[14] reported that nonhirsute patients with acne demonstrated significantly lower levels of sex hormone-binding globulin (SHBG) and higher free testosterone and dehydroepiandrosterone sulfate (DHEAS) levels than controls. Nineteen of 30 acneic patients (63%) had at least one androgen value above the 95% of controls. In the other study, PCOS was found in 19 out of 51 patients with acne (37.3%) and none of the control group[15].

The present findings that Thai hirsutism had no correlation with acne may be explained by different peripheral tissue events and different pathogenetic mechanisms of androgen excess. Women with idiopathic hirsutism who have normal circulating androgen levels are presumed to have an increase in skin 5∝-reductase activity[5]. Furthermore, among women with hyperandrogenemia the presence of hirsutism is not only a function of circulating androgen levels, but may also be determined by events in peripheral tissues[16]. Moreover, Falsetti et al[17] described two different pathogenetic mechanisms which may play a role in the onset of acne and hirsutism in women with PCOS.

Oily skin was very common, so it was doubted whether it was a useful sign of androgen excess. There was a significant correlation between abnormal menstrual intervals and hirsutism in the presented subjects. The authors speculated that hyperandrogenemia might be the cause of these two manifestations in some of the hirsute women in the present study; unfortunately, hormonal assays had not been performed.

In conclusion, the authors purposed that the cutoff score to diagnose Thai hersutism may be 3 or more by the mF-G-L method.

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การวินิจฉัยทางคลินิกภาวะขนดกในสตรีไทย

โสภณ ชีวะธนรักษ์, กรัณฑรัตน์ ปียนันท์จรัสศรี, ชัยณรงค์ โชคสุชาติ

วัตถุประสงค์ *: เพื่อหาค่าคะแนนตามระบบ modified Ferriman-Gallwey-Lorenzo (mF-G-L) ที่จะใช้วินิจฉัยภาวะขนดกในสตรีไทย*

วัสดุและวิธีการ *: คณะผู้วิจัยได้ให้คำนิยามภาวะขนดกว่า การมีจำนวน terminal hair ที่ผิวหนังบริเวณซึ่งตอบสนองต่อฮอร์โมนแอนโดรเจน ปริมาณมากจนสตรีสังเกตได้ด้วยตนเองว่าผิดปกติ และต้องมีคะแนนรวมตามระบบ mF-G-L มากกว่า 97.5 percentile ของประชากรทั่วไป ประชากรศึกษาคือสตรีวัยก่อนหมดระดูที่มารับการตรวจคัดกรองมะเร็งปากมดลูกประจำปีที่โรงพยาบาลโดยไม่มีอาการผิดปกติ เกณฑ์คัดเข้าในการศึกษาคือสตรีที่มีคุณสมบัติดังกล่าวทุกคนเรียงตามลำดับ นอกจากนี้ยังมีการตรวจประเมินสิว และหน้ามันอีกด้วย*

ผลการศึกษา *: ได้ทำการตรวจสตรีจำนวน 531 ราย สตรีที่มีคะแนนขนรวมเท่ากับ 0, 1 และ 2 ตามระบบ mF-G-L รวมกันคิดเป็น 97.8% ของจำนวนสตรีทั้งหมด สตรี 11 รายที่มีคะแนนขนรวมเท่ากับ 3 หรือ มากกว่าทุกรายสังเกตว่าตนเองมีขนมากกว่าปกติ แต่ทั้ง 11 รายตรวจไม่พบสิว*

สรุป *: คณะผู้วิจัยเสนอว่า สตรีไทยที่มีคะแนนขนรวมตามระบบ mF-G-L ตั้งแต่ 3 คะแนนขึ้นไป ควรได้รับการวินิจฉัยว่ามีภาวะขนดก*