International Journal of Research in Dermatology
Subha R et al. Int J Res Dermatol. 2018 Nov;4(4):495-500
http://www.ijord.com

DOI: http://dx.doi.org/10.18203/issn.2455-4529.IntJResDermatol20184459

Original Research Article

Clinical evaluation of hirsutism in South India

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Received: 25 June 2018
Revised: 05 August 2018
Accepted: 06 August 2018

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ABSTRACT

Background: Hirsutism is defined as the presence of terminal coarse hairs in women, in male distribution. Hirsutism affects approximately 5 to 10% of women of reproductive age. There are only very few studies from south India on associations of hirsutism. We analyzed the prevalence of hirsutism among different age groups, etiology and its associated conditions.
Methods: This prospective study was conducted in the Department of Dermatology, of a tertiary hospital in south India over a period of two years. Patients with Ferriman Gallway score of 8 or more were included in the study. Complete history, examination and investigations including USG abdomen & pelvis, hormonal assay were done for all patients. All our patients were screened for metabolic syndrome.
Results: A total of 73 patients with hirsutism were enrolled. Among them, 53 (72.6%) were in the age group of 15 to 35 years. Menstrual irregularities were seen in 35 patients (48%). Face was the commonest site of involvement. Serum total testosterone was elevated in 10 patients (13.7%). LH, FSH ratio was more than 2 in 12 patients (16.4%). Polycystic ovaries were seen on pelvic ultrasonogram in 20 patients (27.3%).
Conclusions: Idiopathic hirsutism was the most common cause of hirsutism in our study. In our study 30% of patients were obese. Among them, features of metabolic syndrome were seen in 31.8%, though majority of our patients were young.

Keywords: Hirsutism, Polycystic ovarian syndrome, Metabolic syndrome, Body mass index

INTRODUCTION

Hirsutism is defined as the presence of terminal coarse hairs in women, in androgen dependent areas like the chin, upper lip, chest, abdomen, back and anterior thighs. Hirsutism affects approximately 5 to 10% of women of reproductive age.[1] Hirsutism usually represents a variation of normal hair growth, but rarely is it a harbinger of a serious underlying condition. Studies of the psychological burden of hirsutism suggest that it has a significant impact and adversely affects the quality of life.[2] Genetic factors and ethnic background also influence hair growth. Virilisation refers to a condition in which androgen levels are sufficiently high to cause additional signs and symptoms such as deepening of voice, breast atrophy, increased muscle bulk, clitoromegaly and increased libido. Virilisation is an ominous sign that suggests the possibility of an ovarian or adrenal neoplasm. In this study we analysed the prevalence of hirsutism among different age groups, etiology and associated conditions of hirsutism. There are only very few studies from south India on associations of hirsutism.

METHODS

In this prospective study, hirsutism patients who had attended the Department of Dermatology, Madras medical college over a period of two years from February 2012 to February 2014, were enrolled.

Inclusion criteria: All hirsutism patients with Ferriman Gallway score of 8 or more.

Exclusion criteria: Patients with Ferriman Gallway score of <8.

Complete history, general examination and dermatological examination were done for all patients. Investigations including USG abdomen & pelvis, hormonal assay –luteinizing homone (LH), follicle stimulating hormone (FSH), testosterone, thyroid function test and prolactin levels were done for all patients. Dehydroepiandrosterone sulphate (DHEAS) and 17- hydroxy progesterone were done for indicated cases.

Polycystic ovarian syndrome (PCOS) was diagnosed based on Rotterdam consesus criteria: [3]

Two of the three criteria are necessary for diagnosis-

1. Oligo or anovulation (<8 menses/year or cycles >35 days), 2. Clinical and/or biochemical signs of hyperandrogenism, 3. Presence of polycystic ovaries and absence of other etiologies (Cushing's syndrome, congenital adrenal hyperplasia, androgen secreting tumors).

As hirsutism is considered as one of the markers of metabolic syndrome, all our patients were screened for increased waist circumference, diabetes mellitus, hypertension and lipid abnormalities.

According to the International Diabetes Federation (IDF) definition of metabolic syndrome, major criteria includes increased Waist circumference (Men >90cm, Women >80cm), along with any two of the following minor criteria are essential for diagnosis.

1. Fasting plasma glucose >100 mg/dl or previously diagnosed type 2 diabetes; 2. Triglycerides >150 mg/dl or specific treatment for this abnormality; 3. HDL <40 mg/dl (men), HDL <50 mg/dl (women) or specific treatment for this abnormality; 4. BP >130/85 mmHg or on treatment for hypertension

With investigation results, endocrinologist opinion was obtained for all patients. Study was approved by institutional ethical committee. Digital photographs were taken.

RESULTS

A total of 73 patients were enrolled in this study. Among them, 53 (72.6%) were in the age group of 15 to 35 years (Table 1).

Table 1: Age distribution of the study population.

Age group (years)	Frequency	Percentage (%)
15 – 25	32	43.8
26 – 35	21	28.8
36 – 45	17	23.3
46 or more	3	4.1
Total	73	100.0

The youngest patient was 15 years old and the oldest was 46 years old. Mean age of patients seen in our study was 29.19 years. Majority of our patients (52.2%) developed hirsutism before the age of 20 years. Duration of disease varied from 1 to 21 years.

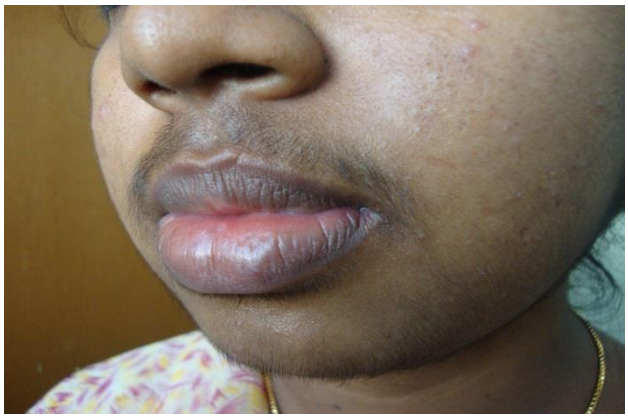

Figure 1: A patient with idiopathic hirsutism.

Menstrual irregularities due to various causes like PCOD, Cushing's syndrome, hypothyroidism and congenital adrenal hyperplasia were seen in 35 patients (48%). Around 22% of patients had family history of hirsutism.

Table 2: Associations.

Associations	Frequency	Percentage (%)
Acne	13	17.8
Acanthosis nigricans	23	31.5
Androgenetic alopecia	11	15
Infertility	5	12.2 (among married)

On analyzing the frequency of other associated conditions, acne in 13 patients (17.8%), acanthosis nigricans in 23 patients (31.5%) and androgenetic alopecia in 11 patients (15%) were present. Infertility was seen in 12.2% of married ladies (5/41) (Table 2).

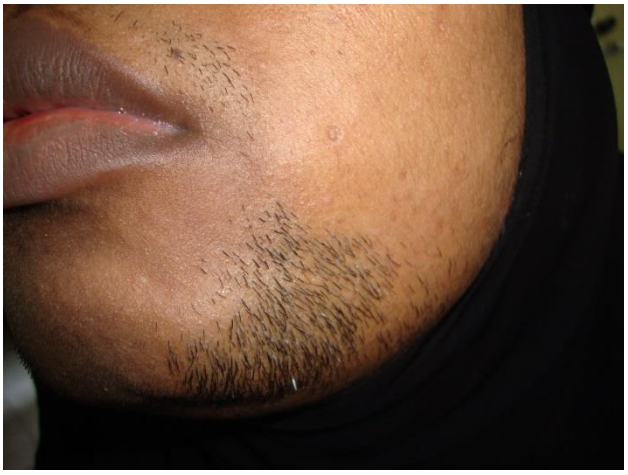

Figure 2: A patient with polycystic ovarian syndrome.

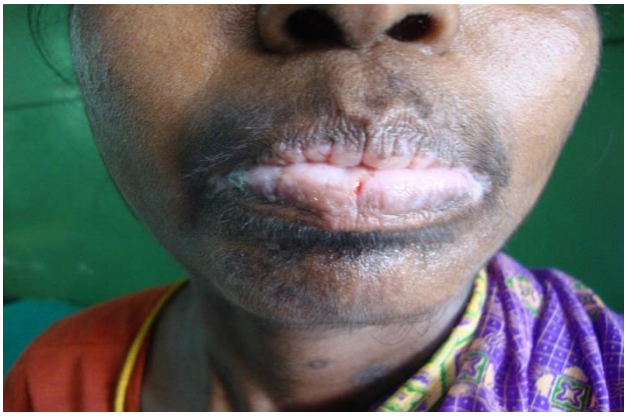

Figure 3: Steroid induced hirsutism in a Pemphigus vulgaris patient.

Most commonly associated cutaneous finding was acanthosis nigricans (31.5%).

Table 3: BMI association.

BMI Group	Frequency	Percentage (%)
Normal (18.5–24.9)	24	32.9
Excess wt.(25-29.9)	27	37.0
Obesity (30 –39.9)	20	27.4
Morbid obesity (> 40)	2	2.7

Most of the patients (67%) were above the normal BMI range. Obesity was seen in 30% (Table 3). Mean BMI was 27.

Table 4: Ferriman Gallway Scoring (Abraham's classification).

FG Score	Frequency	Percentage (%)
Discrete (8-16)	53	72.6
Moderate (17-25)	20	27.4
Total	73	100.0

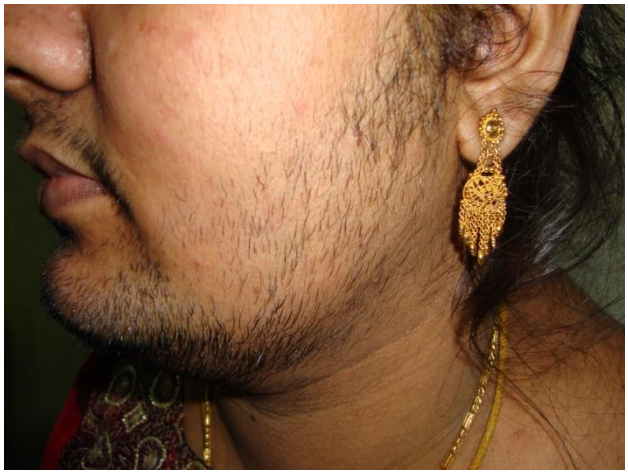

Figure 4: Cyclosporine induced hirsutism in a post renaltransplant patient.

The minimum Ferriman Gallway (FG) score was 9, the maximum score was 21 and average FG score was 15 (Table 4). Maximum score was seen in a patient with congenital adrenal hyperplasia. Face was the commonest site of involvement.

Total testosterone was mildly elevated in 10 patients (13.7%) and LH, FSH ratio was more than 2 in 12 patients (16.4%). High TSH was seen in 7 patients (9.6%). Elevated prolactin level, elevated 17-OH progesterone and increased plasma cortisol level & 24 hrs urine cortisol were seen in one patient each (1.37%). DHEAS was elevated in 5 patients (6.8%) and polycystic ovaries were seen on pelvic ultrasonogram in 20 patients (27.3%).

Table 5: Etiological distribution.

Etiology	Frequency	Percentage (%)
Idiopathic	38	52.0
PCOD	23	31.5
Hypothyroidism	7	9.6
Drugs	3	4.1
CAH	1	1.4
Cushing's syndrome	1	1.4
Total	73	100

Regarding etiology, more than 50% of patients were idiopathic in nature followed by PCOD (Table 5).

Table 6: Co-morbidities.

	Frequency	Percentage (%)
DM /HT	7	9.6
Lipid abnormalities	8	11

Around 10% patients had features of metabolic syndrome. Among 7 patients with diabetes mellitus, 4

were above 40 years and 3 were below 40 years (Table 6).

DISCUSSION

Perception of hirsutism, by definition, is subjective and women present with a wide variation in severity.[4] Hirsutism results from either an exogenous or endogenous increase in circulating androgens or from increased sensitivity of the hair follicles to normal serum androgen levels (end organ dysfunction).

Assessment of hirsutism includes the age of onset, rate of progression and associated symptoms and signs. Usually hair growth is slow but progressive. Sudden development and rapid progression of hirsutism suggests the possibility of an androgen secreting tumour, in which case virilisation may also be present. Most of the patients developed hirsutism before the age of 20 years. Our patients' age group varied from 14 to 48 years, mean age was 29.19 years. Most of the patients (72.6%) were in the reproductive age group (15 to 35 years). This feature is also recorded by Ahmad et al, Sharma et al and Atallah et al.[5-7]

Irregular cycles from the time of menarche are more likely to result from ovarian rather than adrenal androgen excess. We noted irregular menstrual cycle in 35 patients (48%) due to PCOD, Cushing's disease and hypothyroidism. This correlated with study by Tehrani and Jalali.[8,9]

Around 22% (16) of patients had family history of hirsutism which correlates with study by Noorbala and Lorenzo.[10,11] Among 16 patients, 11 had first degree relatives with hirsutism and 7 had PCOD. In our study 67% of patients were above normal BMI range (>25) as recorded by Atallah et al (51%).[7]

In the present study, acne was seen in 17.8% of patients, acanthosis nigricans in 31.5% and androgenetic alopecia in 15% in contrast to an earlier study by Sharma in which acne was the most common association.[6]

A simple and commonly used method to grade hair growth is classical or modified Ferriman- Gallway scale where each of nine androgen sensitive sites (upperlip, chin, chest, abdomen, pelvis, upper arms, thighs, upper back, lower back) are graded from 0 to 4.[12] It is normal for the most women to have some hair growth in androgen sensitive areas. Score of 8 or more suggest excess androgen mediated growths.[13] In this study maximum FG score was 21 which was seen in congenital adrenal hyperplasia. Average FG score was 15. Most of the patients (73%) had FG score in the range of 8 to 16. All patients were more concerned with facial hair. Ahmad et al also recorded FG score from 10 to 34 and face was the most common site.[5]

In hirsutism, key androgens that may be secreted in excess include testosterone which usually originates from the ovary, DHEAS which is of adrenal origin and androstenedione which originates from either the ovary or the adrenal gland.[14] Hormonal estimation is usually done on days 4 to 10 of the menstrual cycle.[15] In androgen secreting tumours, rapidly progressing hirsutism, features of virilization (deepened voice, clitoromegaly, increased muscle mass, increased libido) and significantly elevated androgen level will be seen. Some of the hormones that helped us to evaluate hirsutism are tabulated in Table 7.

Table 7: Hormone assay.

Hormone	Normal value	Interpretation
Total testosterone	20–60 ng/dl	>200 ng/ml suspect virilising tumour
LH to FSH ratio	FSH 3-4 times higher than LH	>2 suggestive of PCOS
Thyroid function test	TSH 0.35-5.5 mIU/ml	Increased value suggests hypothyroidism
17 hydroxy progesterone	<6 nmol/L (20-100 ng/dl)	Useful to differentiate late onset congenital adrenal hyperplasia and PCOS. <200ng/dl-late onset CAH is unlikely
Dehydroepiandrosterone sulphate (DHEAS)	130-407 µg/dl	> 700 µg/dl suggests an adrenal tumour, mild elevation seen in PCOS
Serum prolactin	2-29 ng/ml	Elevated in hyperprolactinemia, PCOS, acromegaly and thyroid disorders
24-hour urine cortisol	10 – 50 µg/dl	>50 to 100 µg/dl (adult)-Cushing's syndrome

In our study among the 23 cases of PCOD (diagnosed based on Rotterdam criteria), elevated testosterone in 10 (43.4%), LH, FSH ratio >2 in 12 (52.1%), elevated DHEAS in 5 (21.7%), increased prolactin in 1 (4.34%) and polycystic ovaries on pelvic ultrasonogram in 20 patients (86.9%) were seen. Among hirsutes, obese women had higher levels of free testosterone.

Causes of hirsutism include idiopathic, polycystic ovarian syndrome, hypothyroidism, cushings syndrome, congenital adrenal hyperplasia, pituitary adenomas,

ovarian tumours, adrenal tumours, drugs and rarely liver diseases.[16]

Patients with hirsutism, with regular ovulation and normal androgen levels in the absence of features that suggest other causes of hirsutism are labelled as having idiopathic hirsutism.[17,18] We have noted that of the 73 patients, 53% had idiopathic hirsutism, which was the most common cause. Ahmad showed 80% idiopathic cases in his study on hirsutism in Kashmir which correlates with our study.[5] Polycystic ovarian syndrome (PCOS), also known as Stein-Leventhal syndrome can present with menstrual irregularities, hyperandrogenism and infertility. The major source of hyperandrogenemia in PCOS appears to be gonadotropin dependant functional ovarian hyperandrogenism which causes maturation arrest of ovarian follicles, accounts for the "polycystic" appearance of the ovaries.[4] In our study PCOD was seen in 31.5% of patients which correlates with Zargar et al who noted 37.3% in his 150 Kashmir patients.[19] Here 10% were hypothyroidism patients. Features of Cushing's syndrome are hypertension, proximal muscle atrophy, striae, easy bruising, fat redistribution (moon facies, dorsocervical fat pad, supraclavicular fat pad, central and less commonly generalized obesity) and hyperpigmentation. In our study congenital adrenal hyperplasia and Cushing's syndrome constitute 1.5% each. Cyclosporine and prednisolone were the cause of hirsutism in 4% of cases.

PCOS and the metabolic syndrome are frequently associated. We noted that 9.6% (7/73) hirsutism cases were associated with metabolic syndrome. Among them, 3 cases had PCOS, 2 had hypothyroidism and 2 had idiopathic hirsutism. Both PCOS and metabolic syndrome are risk factors for cardiovascular events and stroke.[20] It is thought that insulin resistance may play an important role in the development of both syndromes.[21] Hirsutism in women is an important presenting clinical symptom which often leads to the diagnosis of PCOS. Hence it is important to consider the diagnosis, implications, and treatment of metabolic syndrome in patients presenting with hirsutism.[22]

CONCLUSION

Idiopathic hirsutism (53%) was the most common cause of hirsutism in our study. PCOD (31.5%) was the second common cause. Acanthosis nigricans was the most common cutaneous finding associated with hirsutism. In our study 30% of patients were obese. Among them, features of metabolic syndrome were seen in 31.8% patients though majority of our patients were young. So, detailed investigation including BP, glucose tolerance test and lipid level should be monitored in all obese hirsutes. They have to be followed up for metabolic syndrome.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Subha R, Tharini GK. Clinical evaluation of hirsutism in South India. Int J Res Dermatol 2018;4:495-500.