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Original Research Article

Pattern of dermatologic manifestations in polycystic ovarian disease cases from a tertiary care hospital

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ABSTRACT

Background: Dermatologists often play a significant role in its management. Cutaneous features of hyperandrogenism in Polycystic ovarian syndrome (PCOS) have varied presentation. Aim of this study was the pattern of dermatologic manifestations in polycystic ovarian disease in northern Indian females.
Methods: Patients registering for treatment of polycystic ovarian disease at Dermatology outpatients department during April 2016 to March 2017 formed the study population. Residents interviewed the study subjects at the OPD. General physical examination, systemic examination, breast and pelvic examination, along with detailed dermatological examination were conducting after taking the history. Hormonal analysis was performed after an overnight fasting using enzyme immunoassay.
Results: FSH and LH levels were 5.05±1.86 IU/L and 8.14±5.21 IU/L respectively. Testosterone levels were found to be 61.01±25.32 ng/dl. DHEAS levels among them were 130.05±41.21µg/dl. Two commonest cutaneous manifestations were hirsutism and acne seen in 83.8% and 59.5% of subjects. Female pattern hair loss was seen in 45.6% females. Three most frequent hormonal abnormalities noted in our study subjects were raised L/H ratio, testosterone and LH levels seen in approximately 45%, 35% and 21% cases.
Conclusions: The cutaneous manifestations of PCOS reserve a major role in its management by dermatologists. A lifestyle modification along with systemic treatment remains mainstay of treatment. Monitoring for the foreseen cardiovascular risks should start early to downgrade the morbidity.

Keywords: Acne, Hirsutism, Hyperandrogenism, Polycystic ovary syndrome

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a common female endocrine disorder with prevalence ranging from 2.2% to 26%.[1] This metabolic syndrome exists throughout the world with clinical heterogeneity. This condition is now appreciated as encompassing two interrelated metabolic phenomena- insulin resistance and hyperandrogenism.[2] In 1935, Stein and Levinthal first described the association between polycystic ovaries, amenorrhea, hirsutism and obesity.[3]

It is a multisystem metabolic disorder, which has a major impact on the quality of life as well as fertility. PCOS is coupled with cardiovascular risk factors as well as long-term complications; including obesity, infertility, malignancy, and insulin resistance.[4] Other associations include obstructive sleep apnea, nonalcoholic

steatohepatitis, and psychiatric illnesses, such as depression, anxiety, and eating disorders.[5]

Patients with PCOS are commonly first seen by a dermatologist.[6] Diagnosis is mainly clinical. Dermatologists often play a significant role in its management. Cutaneous features of hyperandrogenism in PCOS have varied presentation. However, to best of my knowledge very few studies are available in literature from northern India. Thus, this study was planned to study the pattern of dermatologic manifestations in polycystic ovarian disease in northern Indian females.

METHODS

The present cross-sectional study was planned and rolled out by the Department of Dermatology in collaboration with Department of Pathology of a tertiary care teaching hospital of western Uttar Pradesh. This investigation was carried out over a period of approximately one year from April 2016 to March 2017. It was planned to include all the patients of polycystic ovarian disease fulfilling the inclusion criteria seeking care at dermatology department during the study period. Patients registering for treatment of polycystic ovarian disease at Dermatology outpatients department (OPD) during the study period formed the study population. From the study population those patients who fulfilled the inclusion criteria were included in this investigation. Inclusion criteria were patients with polycystic ovarian disease aged between 20 to 40 years and willing to participate in the study. Subjects with below 20 years of age and those not consenting for the study were excluded.

A detailed questionnaire was framed for capturing relevant details. Residents of dermatology department interviewed the study subjects at the OPD for gathering information regarding demographic details of the patient, reproductive and gynaecological history, especially the regularity of menstrual cycle, hyperandrogenic symptoms, family history of irregular menstrual cycles, and treatment history. Information was elicited after ensuring comfort and privacy of the respondent. It took about 30 minutes to fill each proforma. Various cutaneous complaints including their duration, evolution and progression were also enquired.

General physical examination, systemic examination, breast and pelvic examination, along with detailed dermatological examination were conducting after taking the history. A thorough examination was undertaken which captured signs of hyperandrogenism viz. acne vulgaris, hirsutism, seborrhea, acanthosis nigricans, acrochordons, hair loss due to androgenic alopecia and striae distensae etc.

For the purpose of this study, diagnosis of PCOS was made as per diagnostic criteria laid down by The Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group.7 Oligomenorrhea was defined as fewer than 9 menstrual periods per year or a cycle duration of at least 45 days. Amenorrhea was defined as absence of menstruation for 3 consecutive months during the previous year. The presence of comedones, erythematous papules and pustules, and nodules and cysts on the face, neck, upper chest, upper back, and upper arms were classified as acne. Pigmented, raised, warty, velvety skin patches on the intramammary folds, nape of neck, and antecubital fossae were classified as acanthosis nigricans. Androgenic alopecia was evaluated according to Ludwig's classification. The presence of greasy or oily and shiny skin on the nasolabial folds, the forehead, or behind the ear and hair was defined as seborrhea or oily skin.

Hormonal analysis was performed after an overnight fasting using enzyme immunoassay (EIA). Venous blood samples were obtained on the second day of spontaneous menstruation for this purpose. Fasting glucose, fasting insulin, serum lipids, and serum TSH were also measured. Study subjects underwent a transvaginal ultrasonography during the early follicular phase PCO morphology.

The study adhered to the tenets of the Declaration of Helsinki for research in humans. Informed consent was obtained from study subjects after discussing advantages and risks. Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. All the questionnaires along with other relevant data were manually checked and were then coded for computer entry. After compilation of the collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 21 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods. Student's t-test and chi-square test were applied to detect statistically significance of the results. A two tailed $p < 0.05$ was considered statistically significant.

RESULTS

Data of 136 study subjects were subjected to final analysis. Mean age of study subjects was 26.53±3.18 years. Mean age of menarche in our study subjects was 13.4±1.02 years. Menstrual abnormalities were observed in 85 subjects, whereas 51 subjects had a normal menstrual pattern. The most frequent menstrual abnormality noted was oligomenorrhea, seen in 77 females, followed by amenorrhea, seen in 10 females. Regarding marital status, 27 patients were married whereas remaining was unmarried. Among the married group of 27 patients, 18 (66.7%) had normal obstetric history, whereas 9 (33.3%) patients had an issue of primary infertility. The prevalence of obesity and overweight in our study group was 28.7% and 55.1%, respectively.

FSH and LH levels in our study patients were 5.05±1.86 IU/L and 8.14±5.21 IU/L respectively. Testosterone

levels were found to be 61.01±25.32 ng/dl. DHEAS levels among them were 130.05±41.21µg/dl (Table 1).

Table 1: Anthropometric and hormonal profile of study subjects.

Variables	Mean	Standard deviation
Age (years)	26.53	3.18
Anthropometric profile		
BMI (kg/m2)	28.04	4.75
Waist-to-hip ratio	1.26	0.33
Hormonal profile		
FSH (IU/L)	5.05	1.86
LH (IU/L)	8.14	5.21
L/H ratio	1.77	1.22
DHEAS (µg/dl)	130.05	41.21
Prolactin (IU/L)	14.98	7.46
Testosterone (ng/dl)	61.01	25.32

A wide variety of dermatologic manifestations were observed in our study subjects. Two commonest cutaneous manifestations were hirsutism and acne seen in 114 (83.8%) and 81 (59.5%) of subjects. Female pattern hair loss was seen in 62 (45.6%) females. Least common cutaneous manifestations noted were striae (19.8%) and acrochordons (11.8%) (Table 2).

Table 2: Prevalence of various dermatologic manifestations among study subjects.

Dermatologic manifestations*	Number of subjects	%
Hirsutism	114	83.8
Acne	81	59.5
Hair loss (female pattern)	62	45.6
Seborrhoea	57	41.9
Acanthosis	48	35.3
Striae	27	19.8
Acrochordons	16	11.8
Others	7	5.1

*Multiple responses permitted

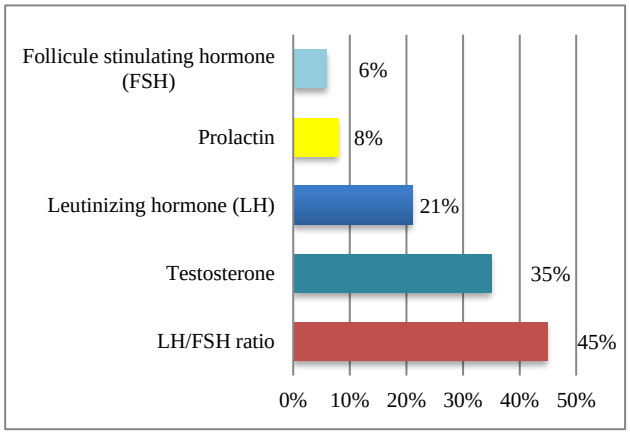

Figure 1: Increased hormonal levels among study subjects.

Regarding increased hormonal levels; three most frequent hormonal abnormalities noted in our study subjects were raised L/H ratio, testosterone and LH levels seen in approximately 45%, 35% and 21% cases. Prolactin levels were seen raised in nearly 8% subjects (Figure 1).

DISCUSSION

Menstrual abnormalities are common in PCOS women. In our study we observed that the most frequent menstrual abnormality noted was oligomenorrhea, seen in 77 females, followed by amenorrhea, seen in 10 females. Another study by Ramanand et al. is also in concordance with our observations.[8] He observed that irregular cycles in 100% of their study participants, whereas infertility was present in 21%. Another study from Jammu and Kashmir observed menstrual disturbances in 65% of the PCOS women, whereas 35% of the patients had normal menstrual cycles.[9] Among these, oligomenorrhea was the most common menstrual disturbance, seen in 57%, followed by amenorrhea seen in 8% of the PCOS women.

Since its original description in 1935 by Stein and Leventhal, obesity has been recognized as a common feature of the polycystic ovary syndrome (PCOS). Nearly 40–80% of women with PCOS are reported to be overweight or obese. Familial aggregation of PCOS strongly supports a genetic susceptibility to this syndrome.[10] Ghrelin is produced by the gastric endocrine cells and has been implicated in regulation of appetite and body weight. Ghrelin levels increase sharply before meals leading to hunger and initiation of food intake and drop after feeding leading to suppression of appetite and satiety.[11] The prevalence of obesity and overweight in our study group was 28.7% and 55.1%, respectively. The result of this study is in agreement with previous systemic review and meta-analysis. Lim SS et al. observed that women with PCOS had a greater risk of overweight, obesity, and central obesity.[12] A similar findings were recorded by Majumdar et al. in his study on comparison of clinical features and health manifestations in lean vs obese Indian women with polycystic ovarian syndrome.[13]

Ovary serves as the source of excess androgens in PCOS patients, which appears to result from an abnormal regulation of steroidogenesis. The excessive secretion of androgens in PCOS patients results in a series of skin changes. In this study we observed that two topmost cutaneous manifestations were hirsutism and acne seen in 114 (83.8%) and 81 (59.5%) of subjects. Another study by Saxena P et al. is also in concordance with our observations.[14] They reported that the prevalence of hirsutism was 89% and 80% in obese and lean PCOS, respectively. Studies from California, University of Alabama and Iran were also in the same view.[15-17] These studies reported burden of hirsutism in women with PCOS in the range of 50–76%. Our findings confirm the results of another study from Andhra Pradesh.[18] In their study, of all the cutaneous manifestations, acne was seen

in the highest percentage (67.5%), followed by hirsutism (62.5%), seborrhea (52.5%), androgenetic alopecia (AGA) (30%), acanthosis nigricans (22.5%), and acrochordons (10%).

In this study, female pattern hair loss was seen in 45.6% females. After thorough literature search, we could get only a few studies that specifically assessed pattern of hair loss in women with PCOS. Carmina E et al. from Italy studied a cohort of 950 women referred for clinical hyperandrogenism, of whom 72% were diagnosed with PCOS, alopecia ranging from Ludwig pattern type I (mild) to type III (severe) was found in 3.2%.[19] The prevalence of female pattern hair loss in PCOS women was found to be 31% in Jammu and Kashmir.[9]

We found that 3 most frequent hormonal abnormalities noted in our study were raised L/H ratio, testosterone and LH levels seen in approximately 45%, 35% and 21% cases. Similar findings were noted by Gowri BV et al.[18] In that study increased level of serum testosterone was seen in 55% patients; whereas increased levels of DHEA-S was seen in 15 45% of patients. Similarly, increased LH was seen in 35% patients; increased LH/FSH ratio was seen in 27.5% patients.

CONCLUSION

PCOS is frequently seen in females of reproductive age group and is associated with various long-term risks. The cutaneous manifestations of PCOS reserves major role in its management by dermatologist. Management of women with PCOS is teamwork to be done by dermatologist, endocrinologist, gynecologist, nutritionist and physical trainer. A lifestyle modification along with systemic treatment remains mainstay of treatment. Monitoring for the foreseen cardiovascular risks should start early to downgrade the morbidity.

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