Journal of Pakistan Association of Dermatologists 2011; **21 (3)**: 174-178.

Original Article

Prevalence of polycystic ovaries among patients with hirsutism and menstrual abnormalities

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Abstract

Background Polycystic ovaries are considered to be the most frequent cause of hirsutism with its prevalence of 10% of woman of reproductive age group. Polycystic ovarian syndrome (PCOS) reflects multiple potential etiologies and variable clinical presentations

Objectives To investigate the prevalence of polycystic ovaries among patients with hirsutism and menstrual abnormalities (oligo- or oligohypomenorrhea) and to correlate presence of hirsutism with BMI, polycystic ovaries, ovarian volume and biochemical markers.

Patients and methods All patients who presented with oligo- or oligohypomenorrhea or hirsutism either in outpatient clinic of Obstetrics and Gynecology, Shalamar Hospital or a private laser clinic were enrolled in study. Patients who had hirsutism with normal menstrual cycle were excluded from study. Enrolled patients were categorized into two groups on basis of hirsutism, group 1: oligomenorrhea/oligohypomenorrhea with hirsutism and group 2: oligomenorrhea/oligohypomenorrhea without hirsutism. A detailed clinical history, clinical examination, hormonal profile and abdominopelvic ultrasound were done in all patients. SPSS version 16 was used for statistical analysis.

Results Out of 90 patients who enrolled in the study, 10 did not report back, so were excluded from study. Out of 80 patients with menstrual problem, 55 (68.7%) had hirsutism (group 1) and 25 (31.3%) had no hirsutism (group 2). Prevalence of polycystic ovaries was 815% among patients with hirsutism and oligo/oligohypomenorrhea (group 1) as compared to 44% in patients with oligo/oligohypomenorrhea without hirsutism (group 2). Ovarian volume >10ml and BMI were not statistically significant among both groups. Regarding hormonal profile, serum LH/FSH ratio and testosterone levels were significant among patients with hirsutism as compared to without hirsutism.

Conclusion Prevalence of polycystic ovaries by morphology, FSH/LH ratio and serum testosterone are significantly present among patients with oligo/oligohypomenorrhea and hirsutism as compared to those with oligo/oligohypomennorhea without hirsutism. However Ovarian volume and BMI are not statistically significant among both groups.

Key words
Polycystic ovaries, oligomenorrhea, oligohypomenorrhea, hirsutism.

Introduction

Hirsutism is a common endocrine disorder, defined as increased growth of terminal hair in a male pattern.[1,2] Polycystic ovaries are one of the most frequent cause of hirsutism which affect 4-10% women of reproductive age group.[3,4] Women with idiopathic hirsutism have normal menstrual cycle and androgen levels[5] whereas women with hirsutism and oligo/oligohypomenorrhea represent one of the

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presentation of polycystic ovaries, as polycystic ovary syndrome reflects multiple etiology and variable presentation.[6] The prevalence of polycystic ovaries is 57.7% in patients with hirsutism[7]; however, the prevalence is high when patients with hirsutism and oligo/oligohypomenorrhea are considered.

The aim of study was to investigate the prevalence of polycystic ovaries among patients with hirsutism and oligo/oligohypomenorrhea and correlate hirsutism with polycystic ovaries, ovarian volume and hormonal profile including LH/FSH ratio, serum testosterone.

Patients and methods

The study was conducted over a period of fifteen months from January, 2009 to March, 2010 in the Departments of Obstetrics & Gynecology, Shalamar Hospital, Lahore and a private laser clinic Naseer Hospital, Lahore. All female patients who presented in either of departments with oligo-/oligohypomenorrhea or hirsutism were enrolled. Patients with hirsutism and normal menstrual cycle were excluded from study. Eligible patients were divided into two groups on basis of hirsutism, group 1: oligomenorrhea/oligohypomenorrhea with hirsutism and group 2: oligomenorrhea/oligohypomenorrhea without hirsutism.

After taking informed consent from patient, detailed history regarding onset of hirsutism, menstrual history, acne and galactorrhea was recorded. Then detailed examination was done especially for body mass index (BMI), hirsutism distribution, breast examination for galactorrhea and abdominopelvic examination to detect any mass that indicated an androgen secreting tumour. Hormonal profile included: serum follicular stimulating hormone (FSH), serum luteinizing hormone (LH), serum prolactin, serum thyroid stimulating hormone (TSH), serum testosterone on day 2 or 3 of menstrual cycle (in early follicular phase). The normal ranges of hormones were followed according to kits used. Abdominopelvic USG was done to rule out adrenal tumour, ovarian morphology and ovarian volume.

All other causes of hirsutism besides PCO were excluded by detailed history, examination and investigations, and if found, such patients were excluded from study. The ultrasound definition of PCO meant presence of at least 12 follicles in each ovary measuring 2-9mm in diameter and/or increase in volume >10ml. Ratio of serum LH/FSH was clinically significant when LH was twice the level of FSH called as reverse ratio.

All data were entered in especially designed pro forma and analyzed by SPSS version 16.

Results

Table 1 shows the prevalence of polycystic ovaries according to morphology of ovaries as 81.1% in group 1 and 44% in group 2 which is statistically significant ($p<0.05$). **Tables 2** and **3** reveal right and left ovaries volume distribution among two groups. **Table 4** shows BMI distribution in both groups which is not statistically significant. **Table 5** correlates FSH/LH ratio among two groups and shows significant *p* value. **Table 6** revealing FSH/LH ratio only in those patients with PCO (by morphology) on USG among two groups and on comparison shows significant *p* value. **Table 7** shows serum testosterone among two groups.

Discussion

Hirsutism is a common endocrine disorder, defined as increased growth of terminal hair in

Table1 Prevalence of polycystic ovaries (PCO) by morphology.

Patients	*Patients with PCO N (%)*	*Patients without PCO N (%)*
With hirsutism	45 (81.8)	10 (18.2)
Without hirsutism	11 (44.0)	14 (56)

P value=<0.05

Table2 Right Ovarian Volume Distribution

Patients	*Ovarian volume >10ml N (%)*	*Ovarian volume <10ml N (%)*
With hirsutism	27 (49.0)	28 (51.0)
Without hirsutism	5 (20.0)	20 (80.0)

P value=<0.05

Table3 Left ovarian volume distribution

Patients	*Ovarian volume >10ml N (%)*	*Ovarian volume <10ml N (%)*
With hirsutism	24 (43.7)	31 (56.3)
Without hirsutism	04 (16.0)	21 (84.0)

P value=<0.05

Table 4 Body mass index(BMI) distribution

Patients	*BMI<24.9kg/m²* *N (%)*	*BMI>25kg/m²* *N (%)*
With hirsutism	14 (25.4)	41 (74.6)
Without hirsutism	07 (28.0)	28 (72.0)

P value=1

Table 5 Luteinizing hormone/follicle stimulating hormone (LH/FSH) ratio distribution.

Patients	*LH/FSH >2 N (%)*	*LH/FSH<2 N (%)*
With hirsutism	27 (25.4)	28 (50.0)
Without hirsutism	10 (28)	15 (60.0)

P value=<0.05

Table 6 Luteinizing hormone/follicle stimulating hormone (LH/FSH) ratio distribution in patients with PCO

Patients	*LH/FSH >2 N (%)*	*LH/FSH <2 N (%)*
With hirsutism	24 (53.3)	21 (46.7)
Without hirsutism	7 (63.7)	4 (36.3)

P value=<0.05

Table 7 Serum testosterone level distribution.

Patients	*With raised levels N (%)*	*With normal levels N (%)*
With hirsutism	40 (54.5)	15 (45.5)
Without hirsutism	10 (40)	5 (60)

P value=<0.05

male pattern. It is most often caused by polycystic ovarian syndrome (PCOS).[2] PCOS is a heterogeneous syndrome of hyperandrogenic anovulation that is typically due to intrinsic ovarian dysfunction.[8] The main manifestations of PCOS include the following: menstrual irregularity, excess body hair, infertility, acne, androgenetic alopecia and obesity. These manifestations appear quite heterogeneously, with marked difference in prevalence and intensity among different groups of women with PCOS.[9] **Table 1** reflects the prevalence of polycystic ovaries as 81.1% in patients with hirsutism and oligo/oligohypomenorrhea (group 1) as compared to 44% seen in patients without hirsutism (group 2) although they had oligo/oligohypomenorrhea. Similarly prevalence of PCO was reported to be 70% in women with both hirsutism and oligo/oligohypomenorrhea by Taponen *et al*.[6]

The ovarian volume >10ml is considered to be diagnostic for polycystic ovaries according to Rotterdam criteria.[11] **Tables 2** and **3** show right and left ovarian volume distribution respectively and is statistically significant in group 1. Similar results as increase in ovarian volume were seen in patients with PCO according to a study in Turkey.[11]

Body mass index (BMI) is defined as weight in kilogram divided by height in meter square. **Table 4** depicts the BMI distribution among two groups which is not statistically significant in our study. This can be explained as polycystic ovary syndrome is heterogeneous group with variety of presentations. Similarly, Tapanen *et al*.[6] when compared BMI of patients with hirsutism and oligo/oligohypomenorrhea and polycystic ovaries to the patients with hirsutism and oligo/oligohypomenorrhea without PCO had nonsignificant *p* value.[6]

The pathophysiology of PCOS is complex involving the hypothalamus-pituitary-ovarian axis, ovarian theca cells hyperplasia, hyperinsulinemia and a multitude of either cytokines and adipocyte driven factors.[12] Secondary to aberration in hypothalamic-pituitary axis, there is high LH/FSH ratios, increased androgen and high estrogen levels. This high LH/FSH ratio is clinically significant when this is ≥2. **Table 5** reveals increased ratio among patients with hirsutism and oligo/oligohypomenorrhea (44.9%) as compared to other group. When we correlate raised LH/FSH ratio in patients with polycystic ovaries and hirsutism at same time in **Table 6**, it is seen that raised LH/FSH ratio along with PCO in patients in group 1 is statistically significant. In fact the presence of hirsutism (sign of hyperandrogenism) with oligo/oligohypomenorrhea (sign of anovulation) with polycystic ovaries on ultrasound and disturbed gonadotrophins are considered to be classic form of polycystic ovarian syndrome.[13]

Hirsutism clinically present in women as excessive hair growth in androgen-dependent areas and hirsutism is one of the sign of functional ovaries hyperandrogenism in patients with PCOS.[14] Testosterone assay is recommended as first-line approach to investigate hyperadnrogenism.[15]

Table 7 reveals 54.5% of patients had raised testosterone whereas 40% of patients without hirsutism giving statistically significant *p* value. Studies done in Iraq and Dubai reported that frequency of skin manifestations (hirsutism, acne, acanthosis etc) was significantly increased in PCO patient with raised serum free testosterone level in comparison with those of normal value.[16]

Conclusion

Prevalence of polycystic ovaries by morphology, LH/FSH ratio and serum testosterone are significantly present among patients with oligo/oligohypomenorrhea and hirsutism as compared to those with oligo/oligohypomenorrhea without hirsutism. However, ovarian volume and BMI are not statistically significant among both groups.

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