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PREVALENCE OF PCOS IN INFERTILE PATIENTS

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ABSTRACT :

OBJECTIVE : *To assess the prevalence of PCOS among infertile women according to Rotterdam criteria.*

STUDY DESIGN : *Cross Sectional Study*

PLACE AND DURATION OF STUDY: *Baqai Institute of Reproduction and developmental Sciences (BIRDS) from Jan 2009 – Dec 2009*

MATHODOLOGY: *1210 participants included in the study, were those who came in BIRDS OPD for fertility concerned. Detailed history, examination, transvaginal ultrasound and hormonal profile were performed in all selected women. While, All those women who were with other Endocrinological disorders e.g. hyper and hypo-thyroidism , hyperprolactinaemia , cushings syndrome and with androgenic tumor were excluded from study.*

RESULTS : *Prevalence of PCOS was identified in 496(40.9%) out of 1210 women, who visited BIRDS OPD during last year .The mean age of participants were 27±8 years. In the studied population 282 (31.5%) out of 1210 women had regular menstrual cycle and no sign of hyperandrogenism i.e hirsutism or acne (GROUP N) .430 of 1210 women (35.5%) had menstrual symptoms such as oligomenorrhae or amenorrhea without hirsutism or acne (GROUP 1) .90 of 1210 women (7.4%) demonstrated androgenic symptoms with regular menstrual cycle (GROUP 2) .308 of 1210 women (25.45%) presented with moderate to severe hirsutism and menstrual symptoms (Group 3) . 125 women from group 1 ,63 from group 2 and 308 women from group 3 fulfilled the Rotterdam Criteria and diagnosed as PCO.*

CONCLUSION: *Prevalence of PCO was found to be 40.9% among infertile which is significantly high.*

Rotterdam criteria was found to be effective for diagnosis of poly cystic ovarian syndrome

KEY WORDS: BIRDS, Polycystic ovary syndrome (PCOS) , Rotterdam criteria , Hirsutism

INTRODUCTION

Polycystic ovary syndrome (PCOS) is common endocrine disorder in women of reproductive age and occurs amongst all races and nationalities. It affects up to 14% of women in western Society [1] and 37.3% in Kashmiri women of Indian subcontinent.[2]In Pakistani women of reproductive age group PCOS was found in 20.7 % of women.[3]

It is characterized by chronic anovulation and hyperandrogenism and can be clinically expressed with infertility , oligo or amenorrhea , hirsutism or androgen dependent alopecia and acne. Additionally , PCOS seems to be associated with

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obesity and metabolic abnormalities such as insulin resistance and dyslipidemia. PCOS is the most common hormonal disorders among women of reproductive age , and is leading cause of infertility.[4] PCOS is difficult to diagnose , as it is often a diagnosis that is reached by exclusion of other medical conditions that cause irregular menstrual cycles and androgen excess.

In 1985 Adam et al described the diagnostic criteria of polycystic ovaries as presence of 10 or more follicles measuring 2-8 mm in diameter , arranged peripherally or scattered throughout an increased amount of stroma.[5]Later in 1990 , other studies described the use of ovarian volume of >10cm^3 as a marker for diagnosis of PCO.[6]

The Rotterdam consensus conference recommended that the presence of any two of the following sign and symptoms with exclusion of other medical conditions would be used to diagnose polycystic ovary syndrome.[7]

1.oligo or anovulation
2.clinical and /or biochemical features
3.signs of hyperandrogenism such as hirsutism and or acne
4.polycystic ovaries (by gynaecological) ultrasound

This means that the presence of PCOS on ultrasound alone does not establish the diagnosis. Previous research have also reported, approximately 20% of women could present ultrasonographic appearance of PCO without other signs and symptoms. [8]

The present study was also designed to follow this criterion in order to investigate prevalence of PCOS in infertile patients.

METHODOLOGY

This cross sectional survey was conducted at Baqai institute of Reproduction and developmental sciences (BIRDS) from Jan 2009 – Dec 2009. 1210 women included in this study were those who attended the OPD of BIRDS for consultation of infertility during this period . Informed consent was taken before including in this study. While , all those women who had other endocrinological disorders such as hypo or hyper thyroidism ,hyperprolactinaemia ,cushings syndrome and androgenic tumor were excluded from this study.

In our research PCOS was diagnosed according to Rotterdam criteria , for that we took detailed history and examination specially looking for age, onset of symptoms, duration and type of infertility (primary or secondary), menstrual pattern ,obesity or weight gain , height and weight , hirsutism and acne.

Menstruation was defined as normal cyclical if woman had menstrual cycle of 22-35 days. Oligomenorrhea if cycle ranged from 35- 45 days and secondary amenorrhea if cycle delayed till 6 months or more.(after exclusion of pregnancy).[9]

Obesity was assessed by body mass index (BMI) as Wt (Kg) / Height (m ^{2})
Normal built 19 -25 kg /m^2
Over weight 26 - 30 kg / m^2
Obese 31 - 40 kg /m^2

TABLE 1:

APPEARANCE OF POLYCYSTICS OVARIES ON TVS IN ALL GROUPS (N=1210)

Clinical characteristics	Number of women	polycystic ovaries in TVS
Normal cycle	382 (31.5%)	13 (1%)
Menstrual symptoms	430 (35.5%)	125 (10.33%)
Hirsutism or acne	90 (7.4%)	63 (5.2%)
Hisutism and menstrual symptoms	308 (25.4%)	300 (24.8%)

TABLE 2:

CLINICAL PROFILE OF PCOS WOMEN (N=496)

Clinical characteristics	No.	%
Age		
20 – 30	390	78.62
30 - 40	106	21.3
Hirsutism (Ferryman Gallway score)		
Mild	300	60.4
Moderate	30	6.04
Severe	41	8.26
Menstrual Symptoms		
Oligomenorhae	400	80.6
Secondary Amenorrhea	33	6.65
Body Mass Index		
Normal	110	22.17
Over weight	310	62.5
Obese	50	10
Very obese	26	5.2 4

Table 3:

HORMONAL ANALYSIS OF PCOS WOMEN (N=496)

Variables	Mean	SD
S.Insulin	14.79	3.55
S.FSH	7.99	2.1
S.LH	9.11	2.3
S. free testosterone	4.6	2.1

Very obese > 40 kg / m^2

Hirsutism was scored by Ferryman Gallway Scoring System , which quantifies the presence of terminal hair over 11 body areas i.e. upper lip , chin , chest, upper back ,lower back , upper abdomen , arm , forearm , thigh and leg .[10]
Detailed transvaginal ultrasound (TVS) was done of all women regarding the size of ovaries , the number and size of follicles , stromal thickness , uterine size ,endometrial thickness and presence of any other pelvic pathology . Sonographically , polycystic ovaries were defined as enlarged ovaries with 8-10 follicles of 2-8 mm in diameter arranged on the periphery of ovaries and increased stromal thickness. Stromal thickness of 4mm was considered as normal . Ovarian volume of 9.5 cm^3 was taken as normal. All those women who were diagnosed as PCOS clinically and sono-graphically were sent for hormonal profile which included day 2 or 3 serum FSH / LH , fasting serum Insulin level. Free testosterone level was advised to those who presented with androgenic characters . fasting Insulin upto 10 microIU / ml was considered normal. Serum free testosterone level of 0.5-2.6 ng/ml was considered as normal. Normal range of FSH in early follicular phase of menstrual cycle was taken as 3.2 -10 mIU /ml and for LH 1.2 -10 mIU/ml .Ratio of LH / FSH was considered as normal if <2.5.

RESULTS

We observed prevalence of PCOS in 496(40.9%) out of 1210 infertile women. Ages of women ranged b/w 20-40 years with mean age of 27±8. In terms of symptomatology in studied population, 282 (31.5%) out of 1210 women had regular menstrual cycle and no sign of hyperandrogenism i.e hirsutism or acne (GROUP N) . 430(35.5%) out of 1210 women had menstrual symptoms such as oligomenorrhae or amenorrhea without hirsutism or acne (GROUP 1) . 90 (7.4%) o f 1210 women demonstrated androgenic symptoms with regular menstrual cycle (GROUP 2) . 308 (25.45%) of 1210 women presented with moderate to severe hirsutism and menstrual symptoms (Group 3). 125 women from group 1 ,63 from group 2 and 308 women from group 3 fulfilled the Rotterdam Criteria and diagnosed as PCOS . Therefore, the prevalence of PCOS in the Studied population was 40.99% (496 of 1210), Table I. In group-3, 308 women presented clinically with menstrual symptoms and androgenic characterstics. out of 308 , 8 women did not have polycystic ovaries sonographically but these 308 women were included in estimation of PCOS because according to Rotterdam criteria , 308 women fulfilled 2 characteristics out of 3 . Moreover, in group-N, 13 (1%) of 382 reported regular menses were not included in the estimation of prevalence of PCOS , as sonographic evidence of polycystic ovaries alone does not fulfill Rotterdam criteria. Hormonal profile of PCOS women was also recorded . Study variable are shown in table3. In this study 125 PCOS women from group 1 and 308 women from group 3 had menstrual symptoms . Similarly 63 women from group 2 and 308 women from group 3 had hirsutism. Acne was not seen as an isolated character but it was present in only 25 (5.0%) women , associated with mild or moderate hirsutism

DISCUSSION

Although PCOS believed to be one of the most common endocrine disorders . There is very few data available on prevalence of PCOS on infertile population in Pakistan . Every investigators had their own preferred methodology for the diagnosis of PCO syndrome. Urbanek et al ,[11] preferred PCOS diagnosis through clinical symptoms and biochemical parameters i.e raised LH and androgen levels . While others used ultrasound as sole criteria for its diagnosis .Mujeeb et al ,[12] revealed 87.7% sensitivity and 99% specificity of ultrasound in diagnosing PCOS . We also used revised 2003 Rotterdam consensus as diagnostic criteria of PCOS , in which diagnosis of PCOS was based on clinical characteristics in combination with ultrasonography . In our study prevalence of PCOS among infertile women was found to be 40.99% (496 out of 1210) ,which is significantly higher . Goodarzi and Azziz [13] , have documented 6.5 – 8 % prevalence of PCOS in unselected women .
Clinical characteristics like age range , menstrual cycle pattern , hirsutism and obesity were analyzed in detail in our study. In our study, PCO women were mostly younger in age i.e <30 years (78.62%). Similarly Koivunen et al[14] , reported that polycystic ovaries by sonography are much more common in women 35 years old or younger (21.6% prevalence) than in older than 36 years (7.8% prevalence). Among menstrual symptoms of PCOS women, oligomenorrhae was common in our study i.e. 80.6%. In Italian women population Crosignani and Nicolosi also reported higher percentage of oligomenorrheic PCOS women(54%).[15] In our study, acne was not found as an isolated character in PCOS women but it was associated with hirsutism in 25(5.0%) women . Carmina et al [16] , also observed higher percentage of PCOS women who had acne ,hirsutism , alopecia and obesity . Details of BMI have shown that there were 62.5% overweight ,10% obese and 5.24% very obese women in our study. Wajeyarantne et al [17] , have documented that world health organization redefined obesity in Asian Indians and considered BMI more than 27 as class 1 obesity .Gambinri et al[18] have reported 50% of PCOS women were overweight or obese .Joan et al [19] were of the view that Asians PCOS women had a lowest prevalence of obesity whereas blacks and hispanics had the highest . Sonography in present study was carried out to observe different ovarian morphologic changes in PCOS women. Transvaginal ultrasound was done to all women who were infertile and presented with menstrual symptoms or androgenic characters like hirsutism or acne .According to Bucket et al [20], increased stromal volume is a feature of PCOS women . and ovarian .Carmina et al[21] , reported highly significant increase in ovarian size in patients with classical PCOS than in women with the other androgenic disorders . In our study mean fasting insulin levels were more than 10 micro IU /ml in PCOS women . Wijeyarantne et al [17],observed that fasting insulin levels were higher in South Asian PCOS women than in Caucasian PCOS women .Kayman et al [22], reported that Mexican American women with PCOS were significantly more insulin resistant than their white counter parts . In our study mean serum LH was not significantly higher than mean serum FSH in PCOS women . Legros et al [23] found a modest association between raised LH to FSH ratio in women with polycystic ovarian morphology .They also indicated elevated ratio of LH /FSH in PCOS women .In our study serum mean free testosterone level in PCOS women was not significantly higher .Fauser [24] indicated that serum testosterone might not be sensitive marker of androgen excess .Legros et al [25] , reported in United States population (Boston), significant difference in serum LH , testosterone , insulin levels of PCOS women and their non PCOS sisters .There was an important limitation of study i.e. the person performing the ultrasound varied from time to time ,this tends to

introduce inter observer bias .Therefore better results can be achieved by maintaining uniformity in the form of radiologist.

CONCLUSION

The prevalence of PCOS can be reliably predicted with the help of clinical features and sonography in infertile women according to Rotterdam criteria .Rotterdam criteria was found to be effective in diagnosis of PCOS in infertile women .Prevalence of PCOS in infertile population was significantly high.

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