Original Article

A Clinical Study on PCOS Patients in a Tertiary Hospital

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Abstract:

Polycystic ovary syndrome (PCOS) is a common condition characterized by menstrual abnormalities and clinical or biochemical features of hyperandrogenism and may manifest at any age. The present study was carried out at Bangabandhu Sheikh Mujib Medical University, Dhaka, from January 2008 to March 2009, on 50 women with PCOS which was diagnosed by three criteria: (1) oligo and/or anovulation, (2) hyperandrogenism and (3) polycystic ovaries, to evaluate their characteristics and laboratory investigation findings.

Most common age was 2125 years (44%), mean BMI 27.10 kg/m2, menstrual cycle irregularity 80%, oligomenorrhoea 28%, dysmenorrhoea 18%, nulliparity 90%, history of abortion 10%, acne in 52%, hirsutism in 50%, and per vaginal findings were anteverted uterus 100%, free fornices 98% and healthy cervix 94%.

Laboratory findings were low (2.8 mIU/ml) serum FSH 2%, raised (>14.7 mIU/ml) serum LH 56%, raised (≥7.8 mmol/L) blood sugar (2hr after 75 g glucose load) 30%, raised (>25 ng/ml) serum prolactin 14%, raised (>4 ?IU/ml) serum TSH 2%, low <3.5 ng/dl), ultrasound of lower abdomen showed evidence of PCOS in 100% cases.

Infertility in women with PCOS can be treated successfully in most women by diet and exercise, clomiphene citrate with or without metformin, laparoscopic ovarian diarthermy, or ovulation induction with gonadotrophins.

Key words: *PCOS, Infertility*

Introduction:

The polycystic ovary syndrome (PCOS), one of the most common causes of infertility due to anovulation, affects 47% of women[1]. The PCOS syndrome is a heterogenous condition which is defined by the presence of two out of the following three criteria: (1) oligo and/or anovulation, (2) hyperandrogenism (clinical and/or biochemical) and (3) polycistic ovaries, with the exclusion of other aetiologies[2]. According to the National Institutes of Health, basic diagnostic criteria should be the presence of hyperandrogenism and chronic oligoanovulation, with the exclusion of other causes of hyperandrogenism such as adultonset congenital adrenal hyperplasia, hyperprolactinaemia and androgensecreting neoplasms[3]. A consensus conference held in Rotterdam agreed on the appropriateness of including ultrasound morphology of the ovaries as a further potential criteria to define the PCOS but also established that at least two of the following criteria are sufficient for the diagnosis: oligo and/or anovulation, clinical and/or biochemical signs of hyperandrogenism and polycystic ovaries at ultrasound[4]. The pathophysiology of PCOS may have a genetic component although it can be suggested that the main factors responsible for the increasing prevalence of PCOS are related to the influence of the environment, including dietary habits, behaviour and other still undefined factors[1]. The clinical features of PCOS are heterogeneous and may change throughout the lifespan, starting from adolescence to postmenopausal age[5]. This is largely dependent on the influence of obesity and metabolic syndrome, which consistently affect most women with PCOS[6]. This represents an important factor in the evaluation of the PCOS throughout life and implies that the PCOS by itself may not be a hyperandrogenic disorder exclusively restricted and relevant to young and fertileaged women but may also have some health implications later in life.

Whereas hyperandrogenism and menstrual irregularities represent the major complaints in young women with the PCOS, symptoms related to androgen excess, oligomenorrhoea or amenorrhoea and, particularly, infertility are the main complaints of adult women with PCOS during the reproductive age. Obesity has an important impact on the severity of these manifestations in proportion to its degree and particularly in the presence of the abdominal phenotype[6]. In addition, there is consistent evidence that it renders affected women more susceptible to develop type II diabetes, with some differences in the prevalence rates between countries and, potentially, in favouring the development of cardiovascular diseases[1].

The present study was carried out to evaluate the characteristics and laboratory examination findings of PCOS patients attending a tertiary hospital in Dhaka city.

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Materials & Methods:

At the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during January 2008 and March 2009, 50 women with PCOS and suffering from primary and secondary infertility who attended the infertility unit were evaluated. Approval for this study was obtained from the institution and all study women gave informed written consents.

The data sheet for this study included age, menstrual history including regularity/irregularity of cycle, history of cycle length, obstetric and medical history, family history, history of diabetes mellitus, hypertension, body mass index, acne, hirsutism, thyroid status, per vaginal examination findings. In the data sheet findings of laboratory investigations included hormonal status like serum follicle stimulating hormone, luteinizing hormone, blood sugar 2hr after 75 g glucose load, serum prolactin, thyroid hormone level. Ultrasonography findings of lower abdomen including both ovaries and fallopian tubes were also noted. Collected data was compiled and analyzed using computerbased software.

Results

Fifty subfertile women suffering from PCOS were recruited for evaluation (Table-I). Age range was 1630 years (mean±SD 24.30±3.98). Menstrual cycle was regular in 10 (20%) and irregular in 40 (80%). Oligomenorrhoea was present in 14 (28%) and absent in 36 (72%). Dysmenorrhoea was observed in 9 (18%) and absent in 41 (82%). Out of 50 women, 45 (90%) were nulliparous and 5 (10%) primiparous. History of abortion was present in 5 (10%) and absent in 45 (90%) patients. Findings of per vaginal examination revealed that uterus was anteverted in all 50 cases (100%), fornices was free in 49 (98%) and adhesion in 1 (2%), and cervix was healthy in 47 (94%) and unhealthy in 3 (6%) cases.

Table-I. Characteristics of women with PCOS (n=50)

Parameters		Frequency	Percentage
Age (years)			
≤20		10	20.0
21-25		22	44.0
26-30		18	36.0
Mean±SD	24.30±3.78		
Range	16.0-30.0		
BMI (kg/m2)			
Mean±SD	27.10±2.05		
Range	21.80-34.00		
Menstrual cycle			
Regular		10	20.0
Irregular	40	80.0	
Oligomenorrhoea			
Present	14	28.0	
Absent	36	72.0	
Dysmenorrhoea			
Present	9	18.0	
Absent	41	82.0	
Parity			
Nulliparous	45	90.0	
Primiparous	5	10.0	
History of abortion			
Present	5	10.0	
Absent	45	90.0	
Acne			
Present	26	52.0	
Absent	24	48.0	
Hirsutism			
Present	25	50.0	
Absent	25	50.0	
Per vaginal findings			
Position of uterus			
Anteverted	50	100.0	
Fornices			
Free	49	98.0	
Adhesion	1	2.0	
Cervix			
Healthy	47	94.0	
Unhealthy	3	6.0	

Laboratory examination findings have been shown in Table-II. Serum FSH range was 2.3013.10 mlU/ml (mean±SD 6.10±1.94). In only 1 patient (2%) serum FSH level was low (<2.8 mlU/ml) and normal (2.821.0) in the rest 49 (98%) patients.

Table-II. Laboratory examination findings (n=50)

Parameters		Frequency	Percentage
Serum LH (mIU/ml)			
Normal (1.1-14.7)		22	44.0
Raised (>14.7)		28	56.0
Mean±SD	15.02±3.66		
Range	6.70-25.50		
Serum FSH (mIU/ml)			
Low (<2.8)		1	2.0
Normal (2.8-21.0)		49	98.0
Mean±SD	6.10±1.94		
Range	2.30-13.10		
Blood sugar (2 hrs after 75 g glucose load) (mmol/L)			
Normal (<7.8)		35	70.0
Raised (≥7.8)		15	30.0
Mean±SD	7.24±1.90		
Range	4.20-13.20		
Serum prolactin (ng/ml)			
Normal (1.9-25.0)		43	86.0
Raised (>25.0)		7	14.0

Mean±SD	23.52±46.96		
Range	5.60-315.18		
Serum TSH (μIU/ml)			
Normal 0.4-4.0		49	98.0
Raised (>4.0)		1	2.0
Mean±SD	2.35±0.82		
Range	0.94-4.20		
USG of lower abdomen findings			
Evidence of PCO		50	100.0

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Serum LH was normal (1.114.7 mIU/ml) in 22 (44%) women and raised (>14.7 mIU/ml) in 28 (56%) cases. Mean (±SD) serum LH level was 15.02±3.66 mIU/ml (range 6.7025.50).

Mean (±SD) blood sugar (24 hours after 75 g glucose load) was 7.24±1.90 mmol/L (range 4.2013.20); in 35 (70%) women, blood sugar was within normal range (<7.8 mmol/L and in 15 (30%) was raised (≥7.8 mmol/L).

Serum prolactin was normal (1.92.5 ng/ml) in 43 (86%) and raised (>25 ng/ml) in 7 (14%) women; mean (±SD) was 23.52±46.96 ng/ml (range 5.60315.18).

Mean (±SD) serum TSH level was 2.35±0.82 ?IU/ml (range 0.944.20); 49 (98%) women had normal level (0.44.0 ?IU/ml) and 1 (2%) had raised value (>4.0 ?IU/ml).

All 50 (100%) women showed polycystic ovaries in ultrasonogram of lower abdomen.

Discussion:

In this study we observed that there is heterogenicity in the presentation of patients with PCOS. The pathogenesis of PCOS is poorly understood, but the primary defect may be insulin resistance leading to hyperinsulinaemia. In the ovary, the cardinal feature is functional hyperandrogenism. Circulating concentrations of insulin and luteinizing hormone (LH) are generally raised. The theca cells, which envelop the follicle and produce androgens for conversion in the ovary to oestrogen, are overresponsive to this stimulation. They increase in size and overproduce androgens. The rise in LH levels is thought to be caused by the relatively high and unchanging concentrations of oestrogens that may alter the control of this hormone by the hypothalamicpituitary axis. This combination of raised levels of androgens, oestrogen, insulin and LH explains the classic PCOS presentation of hirsutism, anovulation or dysfunctional bleeding, and dysfunction of glucose metabolism. Paradoxically, although the insulin regulatory molecules on the theca cells are responsive to insulin, those in the muscle and liver are resistant[7].

Laparoscopic ovarian diathermy has been used in the management of anovulatory women with clomiphenecitrate (CC)resistant PCOS for the past two decades. With ovulation rates of 7080% and pregnancy rates of 3060% within 612 postoperative months[8-15].

Menstrual dysfunction, including irregular periods, can be managed by administration of progestins (e.g. medroxyprogesterone acetate or norethisterone) or the oral contraceptive pill. Endometrial hyperplasia should be assessed by ultrasound examination, endometrial biopsy or hysteroscopy, and can be treated by hormonal therapy, such as the oral contraceptive pill or progestins[7].

Lifestyle changes are the firstline intervention in women with PCOS who are overweight[16]. Glucose intolerance can be managed by diet and exercise, weight control and oral antidiabetic drugs (e.g. metformin).

The cause of infertility in patients with PCOS is generally lack of ovulation because of a failure of the follicles to develop beyond 10 mm. Most cycles are anovulatory and induction of ovulation is essential. Several studies have shown that weight loss can lead to resumption of ovulation within weeks[17-18]. Clark and colleagues demonstrated that even a 5% reduction in body mass restores ovulation and fertility[19-20].

Clomiphene citrate is an oral oestrogen antagonist that raises circulating concentrations of FSH and induces follicular growth in most women with PCOS and anovulation[7]. Use of the insulinsensitizing drug metformin at doses of 5002500 mg daily is controversial but appears valuable in increasing menstrual cyclicity and pregnancy rate[21-24].

Invitro fertilization, provided there is no problem other than anovulation, has little place in the management of infertility resulting from PCOS. Ovulation induction by a skilled reproductive endocrinologist is preferable to invitro fertilization because of the risks of hyperstimulation and multiple pregnancy with the latter procedure[7].

Women with PCOS require ongoing surveillance to detect impaired glucose tolerance, hyperlipidaemia, endometrial hyperplasia and consequent complications. Obese women, in particular require regular (possibly annual) glucose tolerance testing because of the potential for rapid progression from normal to impaired glucose tolerance and diabetes[25].

Our evaluation of 50 women with PCOS showed low (<2.8 mIU/ml) serum FSH in 2%, raised (>14.7 mIU/ml) serum LH in 56%, raised (≥7.8 mmol/L) blood sugar (2hr after 75 g glucose load) in 30%, raised (>25 ng/ml) serum prolactin in 14%, raised (>4 ?IU/ml) serum TSH in 2%, and and ultrasonogram of lower abdomen showed 100% evidence of polycystic ovaries.

Conclusion:

The diagnosis of PCOS may prove difficult in a few cases, and referral to a medical or reproductive endocrinologist may be valuable. Most gynaecologists have experience in using clomiphene citrate, but referral to an infertility expert is best when gonadotrophins are needed. Most patients with PCOS can be diagnosed and managed in general practice. Lifestyle changes as recommended in diabetes are fundamental for treatment, and addition of insulinsensitizing

agents (e.g. metformin) may be valuable in circumstances such as anovulatory infertility.

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