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Clinico-Biochemical Profile of Polycystic Ovary Syndrome in Northern area of Bangladesh

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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 different hospitals and privet chambers (northan region of Bangladesh), from January 2012 to December 2014, on 50 women with PCOS which was diagnosed by three criteria: (1) oligovulation and/or anovulation, (2) hyperandrogenism and (3) polycystic ovaries. Most common age was 21-25 years (44%), mean BMI 27.10 kg/m^2, 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 serum FSH 2% (2.8 mIU/ml), raised serum LH 56% (>14.7 mIU/ml). LH: FSH retio increased more than 3:1, raised blood sugar (2hr after 75 g glucose load) 30% (7.8 mmol/L), raised serum prolactin 14% (>25 ng/ml), raised serum TSH 2% (>4 IU/ml), low T_4 (<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 (Rottardum 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 study, basic diagnostic criteria should be the presence of hyperandrogenism and chronic oligoanovulation, with the exclusion of other causes of hyperandrogenism such as adult onset 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 relevant to young and fertile women but may also have some health implications later in life.

Whereas hyper androgenism 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].

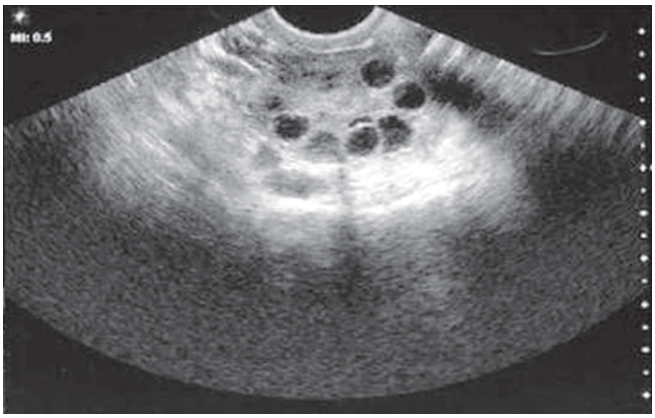

Figure 1: Typical Utrasonographic appearance of an ovary in PCOS.

The present study was carried out to evaluate the characteristics and laboratory findings of PCOS patients attending different practicing area in Northern part of Bangladesh including Rafatullah Community Hospital, Bogra.

Rationale of the study

There is an increasing awareness of PCOS among the female population along with an increase in diagnosis and an increased incidence of established co-morbidities such as obesity and type 2 diabetes.[2,9,10] PCOS may mimic other disorders such as congenital adrenal hyperplasia and androgen secreting neoplasms. Given the variability of signs, symptoms, biochemical and radiologic features in a given individual, diagnosis of PCOS can be easily missed.[19] Moreover, even when PCOS is correctly diagnosed screening for other metabolic constellations may not be consistently carried out. In Bangladesh very few studies has been done regarding PCOS. Therefore, we evaluated the diagnostic and laboratory findings in our local urban setting.

Materials & Methods

During January 2012 to December 2014, 50 women with PCOS were selected purposively which was diagnosed by three criteria: (1) oligo and/or anovulation, (2) hyperandrogenism and (3) polycystic ovaries.

The data collection questionnaire 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 MS Excel and SPSS software.

Results

Fifty subfertile women suffering from PCOS were recruited for evaluation (Table-I). Age range was 16-30 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	90.0 45	
Primiparous	5	10.0
History of abortion Present 5	10.0	
Absent	45	90.0
Acne Present 26	52.0	
Absent	24	48.0
Hirsuitism 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

Table-II. Distribution of the respondents by their laboratory findings (n=50)

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		
S Oestrogen raised	50	10.0
Serum TSH (µIU/ml)		
Normal 0.4-4.0	49	98.0
Raised (>4.0)	1	2.0
Mean±S D 2.35±0.82		
Range 0.94-4.20		
USG of lower abdomen findings		
Evidence of PCO	50	100.0
BMI		
<25	6	12
25–29.9	27	54
>30	17	34

Discussion

In this study we observed that there is heterogenicity in the presentation of patients with PCOS.

44% were from 21-25 years age group. Irregular menstrual cycle (80%), Absent Oligomenorea (72%), absent Dysmenorea(82%), Nulliparous parity (90%), Acne (52%), healthy cervix (94%) were found among the respondents. Our

evaluation of 50 women with PCOS showed low serum FSH in 2% (<2.8 mIU/ml), raised serum LH in 56% (>14.7 mIU/ml), raised blood sugar (2hr after 75 g glucose load) in 30% (>7.8 mmol/L), raised serum prolactin in 14% (>25 ng/ml), raised serum TSH in 2% (>4 µIU/ml), and ultrasonogram of lower abdomen showed 100% evidence of polycystic ovaries. Ovarian volume 10 10 cm^3 , number of follicles are more than 12 which are peripherally arranged and diameter of cyst are 2-9 mm.

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. The combination of raised levels of androgens, oestrogen, insulin and LH explains the classic PCOS presentation of hirsutism (50%), anovulation or dysfunctional bleeding, and dysfunction of glucose metabolism were also common in some cases.[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 anti-diabetic 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].

Menstrual dysfunction, including irregular periods, can be managed by administration of progestins (e.g. medroxyprogesterone acetate or norethisterone) or the oral contraceptive pill.[25] 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].

In this study, 88% of the participants were overweight or obese (BMI>25); higher frequency of obesity and overweight may be attributed to the food habits, lack of exercise in Bangladeshi women. Obesity frequently complicates polycystic ovarian syndrome but is not a defining characteristic.

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 insulin sensitizing drug (metformin) at doses of 500-2500 mg daily is controversial but appears valuable in increasing menstrual cyclicity and pregnancy rate[21-24].

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 70-80% and pregnancy rates of 30-60% within 612 postoperative months[8-15].

Conclusion

PCOS is a very heterogeneous disorder of different phenotypes. No single clinical or laboratory finding can be a characteristic attribute to diagnose PCOS. The diagnostic approach should be based largely on history and physical examination, thus avoiding numerous laboratory tests that do not contribute to clinical management. 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. Although treatment should be individualized, it should also focus on all metabolic consequences and decreasing future complications. More extensive research and understanding of the PCOS will improve treatment success and overall management of patients.

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