

PREVALENCE OF POLYCYSTIC OVARIES IN GYNAECOLOGICAL POPULATION

Edwar Z.Khosho¹, Ahlam Abdul-Hadi² & Hutham W.A. Al-Serrai³

ABSTRACT

Objective: To determine the prevalence of polycystic ovaries in women of reproductive age by using ultrasound and to assess the biochemical indices in these women.

Setting: This study was carried out in Basrah Maternity and Children Hospital for the period between 1st of January to 30th of September 2008.

Methods: The prevalence of polycystic ovaries in gynaecological population of 617 women of reproductive age was determined by pelvic ultrasonography. The women included were any women attending the outpatient department and referred by gynaecologist to do an ultrasonic examination for any cause other than pregnancy.

Ovarian volume was calculated in all women. Serum levels of luteinizing hormone (LH), follicle stimulating hormone (FSH), testosterone & prolactin were measured in 42 women (55%) in group A, 10 (34%) in group B & 50 women (8%) in group C.

Results: The ovarian ultrasonic appearance of 105 (17%) women met the morphological criteria of polycystic ovaries of which 88 women (14.3%) had bilateral polycystic ovaries and 17(2.7%) had unilateral polycystic ovaries; of these women, 76(72.4%) has irregular cycles (group A) and 29(27.6%) had normal cycles (group B). The remaining women with normal ovarian morphology constituted (group C).

Group A shows lower mean age & lower parity than group B & C. Mean ovarian volume was statistically higher in both group A (14.3±0.8ml) & B (12.8±1.7) than in group C (6.3±0.2ml) & there is no significant difference in the number of peripheral cysts between groups A&B. Mean LH/FSH. ratio, serum testosterone & serum prolactin values were statistically higher in group A only. Obesity is more common in group A.

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a clinical problem characterized by menstrual abnormalities, hirsutism, obesity and metabolic syndrome, resulting from abnormalities in the metabolism of androgens and oestrogen and in the control of androgen production. It was often associated with enlarged ovaries, however, it is known that PCOS may occur in women with normal sized ovaries and polycystic ovarian changes can be found in women with normal menstrual cycles.^[1] Polycystic ovary syndrome is a common health problem that affects teenage girls and young women. Its cause is really not known, some research has suggested that PCOS may be related to increased insulin production in the body-PCOS seems to run in families.^[2]

Symptoms include:

- Oligomenorrhoea or amenorrhoea.^[2]
- Heavy, irregular vaginal bleeding. About 30% of women with PCOS have this symptom.^[3]
- Hair loss from the scalp and hair growth (hirsutism) on the face, chest, back, upper abdomen, thumbs, or toes. More than 70% of women with PCOS complain of these hair problems caused by high androgen levels.^[2]

- Acne and oily skin, caused by high androgen levels.
- Symptoms of too much insulin (hyperinsulinemia) and insulin resistance, which can include upper body weight gain and skin changes, such as skin tags or dark, velvety skin patches under the arm, on the neck, or in the groin and genital area.^[4]
- Depression or mood swings. Hormonal changes are a known cause of emotional symptoms.^[5]
- Infertility this is because of anovulatory cycle.^[6]
- Chronic pelvic pain^[3]

Standard diagnostic assessments:

1. History-taking specifically for menstrual pattern, obesity, hirsutism, and the presence of breast discharge. A clinical prediction rule found that these four questions can diagnose PCOS with a sensitivity of 77.1% and a specificity of 93.8%.^[2,3]
2. Ultrasonography, specifically looking for small ovarian follicles. In PCOS, there is a so called "follicular arrest", i.e., several follicles develop to a size of 5-7 mm, but not further.

¹MBChB, FICMS, DGO, ²MBChB, FICMS, DGO,

^(1,2,3)Department of Obstetrics & Gynaecology, College of Medicine, University of Basrah, Iraq

No single follicle reaches the preovulatory size (16mm or more).^[3]

3. *Laparoscopic examination may reveal a thickened, smooth, pearl-white outer surface of the ovary.^[5]*
4. *Hormonal assay: elevated serum levels of androgens including androstenedione and testosterone.^[5,6]*

The ratio of LH (Luteinizing hormone) to FSH (Follicle stimulating hormone) is greater than 1:1. as tested on Day 3 of the menstrual cycle.^[5,6]

Treatment

Medical treatment of PCOS is tailored to the patient's goals. Broadly, these may be considered under four categories.^[6]

- Lowering of insulin levels
- Restoration of fertility
- Treatment of hirsutism or acne.
- Restoration of regular menstruation, and prevention of endometrial hyperplasia and endometrial cancer.

Aim of the Study: To determine the prevalence of polycystic ovaries in women of reproductive age by using ultrasound & to assess the biochemical indices in such women.

MATERIALS AND METHODS

A cross-sectional study done in ultrasonic department of Basrah Maternity and children Hospital for a period from 1st of January to 30th of September 2008. The women included in this study were any woman attending the outpatient department & was referred by gynaecologist to do an ultrasonic examination for any cause other than pregnancy & she accepted to do the examination and to be included in the study. A total number of 617 women were included in the study. Their age ranged from 18-40 years. After taking the history, all patients were referred for transabdominal ultrasound examination and their findings were reported. The following information were obtained, name, age, parity, body weight, & height, level of education, occupation, details of menstrual history, fertility patterns, reason of attendance, if any biochemical test including serum FSH,

LH, testosterone and prolactin have been done to them. The diagnosis of PCO was based on the presence of peripheral cysts (10 or more) of less than 10 mm in size in an enlarged ovary with significant increase in the central stroma. The women with polycystic ovaries were considered as case group and they were further divided into two groups. Group A-consists of women with PCO & irregular menstruation (no. 76), and group B-consists of women with PCO & regular menstruation (no. 29). The remaining women with normal ovarian morphology were considered as group C. Body mass index (BMI) was estimated for each woman (Weight in kilogram/height in square meter). BMI classification according to the National institute of Health guidelines as follows:^[7]

1. Under weight BMI <19 Kg /m².
2. Normal weight BMI 19-24.9Kg/m².
3. Over weight BMI 25-29.9 Kg/m².
4. Class 1 obesity BMI 30-34.9 Kg/m².
5. Class 2 obesity BMI >35 Kg/m².

Biochemical investigations including S.testosterone, s. prolactin & LH/FSH Ratio were performed in 42 women of group A, 10 women of group B & 50 women in group C. statistical analysis done according to ANOVA test or Chi-square test as appropriate & P-value is considered significant at <0.05.

RESULTS

A total number of 617 women attending the ultrasound department in Basrah Maternity and Children Hospital have been examined by transabdominal ultrasound. The ovarian ultrasound appearance of 105 (17%) met the morphological criteria of polycystic ovaries, of those women 17(2.7%) had unilateral PCO and 88(14.3%) had bilateral PCO.

Table-1, shows that mean age was significantly lower in group A than both group B & C. Also there was high percentage of nulliparity among group A while group B showed high percentage of women with parity 1-4. BMI was significantly higher in group A

BMI was significantly higher in group A only.

Table 1. Patients characteristics

Variables	Group A No. 76	Group B No. 29	Group C 512	P-value
Age in years (mean)	20.2	26	27.3	P < 0.05
Parity Nulipara 1-4 5 and above	46 (48.68%) 27 (35.52%) 3 (3.94%)	5 (13.79%) 22 (75.86%) 2 (6.89%)	133 (23.82%) 289 (56.44%) 90 (17.57%)	P < 0.001
Education Illiterate Primary Secondary Higher	4 (5.26%) 30 (39.47%) 34 (44.73%) 8 (10.52%)	5 (17.24%) 13 (44.82%) 10 (34.48%) 1 (3.44%)	183 (35.74%) 220 (42.96%) 86 (16.79%) 23 (4.49%)	P < 0.001
BMI (body mas index)	28.1 ± 2.7	22.9 ± 2.5	21.8 ± 1.7	P < 0.05

Table-2, Shows the ovarian morphology, it shows that the mean ovarian volume and total follicular number were significantly higher in both group A & B than group C.

Table 2. Ovarian ultrasound morphology.

Variables	Group A	Group B	Group C	P-value
Mean ovarian volume (cm³)	14.3 ± 0.8	12.8 ± 1.7	6.3 ± 0.2	P<0.001
Total follicular no.	13.5 ± 1.3	12.3 ± 1.2	1.9 ± 0.6	P<0.001

Table-3, Shows the biochemical tests including S.testosterone, S. Prolactin & LH/FSH ratio for all groups. It shows that S.testosterone, S.prolactin & LH/FSH ratio were higher in group A only compared to groups B & C.

Table 3. Biochemical indices.

Variable	Testosterone Ng/ml (mean ± SD)	LH/FSH Ratio (mean ± SD)	Prolactin (mean ± SD)
Group A	1.3 ± 0.4	2.9 ± 1	20.5 ± 4
Group B	0.7 ± 0.2	1 ± 0.8	10.5 ± 3
Group C	0.6 ± 0.2	0.6 ± 0.4	8 ± 1
P-value	P<0.05	P<0.001	P<0.001

DISCUSSION

Polycystic Ovary Syndrome (PCOS), is one of the most common endocrine disorders that affects approximately 17-22% of women in reproductive age.^[8] The Syndrome is the most frequent cause of anovulatory infertility.^[9] The Syndrome has an initial onset in peripubertal years and is progressive.^[10] Recent development in pelvic ultrasonography has enabled more detailed descriptions of enlarged cystic ovaries. PCO is characterized by peripheral cysts (10 or more) less than 10 mm in size in an enlarged ovary with significant increase in central struma.^[11] In this study it was found that the prevalence of PCO among gynecological population of 617 women attending an out-patient department of Basrah Maternity and Children Hospital & were referred to do an ultrasonic examination was 17%. This finding is similar to Botosis, et al,^[12] who found that the incidence of PCO in Areteion Hospital, Athens, Greece was 17%. In the present study the prevalence of unilateral PCO was 2.7% and bilateral PCO was 14.3%, this result is slightly lower than the result of another study done in Melbourne, Australia which found that the incidence of PCO was 23% of which 17% was bilateral and 6% was unilateral.^[13] The age distribution, the mean age for group A was significantly less than those for group B & C. This is in agreement with another study which found PCOS has been identified in much younger population.^[10] Also in this study there was higher prevalence of nulliparity among group A compared to group C (48.6% compared to 23.3%) this is not surprising since, PCO is one of the main causes of anovulatory infertility.^[9] In this study women with PCO & irregular cycle i.e. group A had mean BMI which was higher than those with PCO and regular cycle (group B) & group C. This result is in agreement with the result of Botosis, et al, which found that obesity was more common in women with PCO & irregular menses.^[12] Regarding the study of ovarian morphology, it was found that mean ovarian volume in both groups, A & B was higher than in group C (14.3±0.8, 12.8±1.7, 6.3±0.2 respectively). This result is similar to study done by Botosis, et al which also found that mean ovarian volume was higher in women with PCO in both regular and irregular cycle (13.4, 11.3 and 6.2 respectively).

^[12] Regarding the biochemical indices, it was found that women with PCO and irregular menses had significantly higher levels of S.testosterone and LH/FSH ratio than both groups, B & C. This result is in agreement with Botosis, et al, which also found high level of testosterone in women with PCO and irregular menses (1.1 & 0.7 ng/ml).^[12] Also the mean LH/FSH was also higher in group A only (2.1 & 0.7 ng/ml). Regarding s. prolactin, it was found that women with PCO and irregular menses had s.prolactin which was higher than those with PCO and normal menstruation and group C. This may indicate that many of those women with PCO and irregular menstruation are cases of PCOS and it is well known that those women with PCOS have elevated s-testosterone, LH/FSH ratio and s.prolactin.^[14]

Conclusions & Recommendations

The prevalence of polycystic ovaries in gynaecological population was 17%, of which 14.3% was bilateral & 2.7% was unilateral, Screening the ovaries in women of reproductive age and subsequent assessment of morphology in PCO can aid in the diagnosis of this condition in patients who may have a variable clinical presentation.

REFERENCE

1. Guzick DS. Polycystic ovary syndrome. *Am J Obstetrics & Gynecology*. 2004; 103: 181-193.
2. Marshall K. Polycystic ovary syndrome clinical consideration. *Altern Med Rev*. 2001; 6:272-292.
3. Norman RJ, Wu R, Stankiewicz MT. Polycystic ovary syndrome. *MJA*. 2004;180(3):132-137.
4. Ehrmann DA, Barnes RB, Rosefield RL, Cavaghan MK, Imperial J. Prevalence of impaired glucose tolerance and diabetes in women with polycystic ovary syndrome. *Diabetes Care*. 1999; 22:141_6
5. Balen A, Mickelmore K. What is polycystic ovary syndrome. *Human Reproduction*. 2002; 17(9):2219-2227.
6. Hunter MH, Sterrett JJ. Polycystic Ovary Syndrome: it's Not Just Infertility. *American Academy of Family Physicians*. 2000; 62(5).
7. National Heart, Lung, and Blood institute. Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults. NIH Publication No. 98-4083. Bethesda (MD) Department of Health and Human Services. National institutes of Health. (1998)
8. Franks S. Polycystic ovary syndrome. *N Engl. J Med*; 1995; 333:853-861.
9. Adams J, Franks S, Kagan DW, Feanks S. Prevalence of polycystic ovaries in women with an ovulation and idiopathic hirsutism. *BMJ* 1986; 293: 355-359.

10. Michelmore KF, Balen AH, Dunger DB, Vessey MP. Polycystic ovaries and associated clinical and biochemical features in young women. *Clin Endocrinology oxf* 1990; 51: 779-786.
11. Conway GS, Honour JW, Jacobs HS. Heterogeneity of polycystic ovary syndrome: clinical, endocrine, and ultrasound features in 556 patients. *Clin endocrinology(oxf)* 1989; 30:459-470.
12. Botosis D, Kassanos D, Pyrgiolis E, Azourlas P. Sonographic incidence of polycystic ovaries in gynecological population. *Ultrasound in obstetrics & gynecology* 1995; 182-185.
13. Low EP, Kovacs G, How LETT, Donna. Incidence of poly cystic ovaries & poly cystic ovary syndrome among women in Melbourne, Australia & New Zealand. *Journal of obstetrics & gynecology* 2005; 45:17-19.
14. Balen AH, Conway GS, Kaltsas G, et al. Polycystic ovary syndrome: the spectrum of the disorder in 1471 patient. *Human Reprod* 1995; 11: 102-107.