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UNILATERAL POLYCYSTIC OVARY SYNDROME

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ABSTRACT

Two-hundred and seventeen subjects underwent transvaginal ultrasound; 17 (8%) had unilateral polycystic ovary (PCO). Twelve percent of subjects with unilateral scan-PCO had oligomenorrhea, 24% were amenorrheic, 23% were hirsute and 29% had acne. Biochemical parameters were compared between subjects with unilateral scan-PCO and those with bilateral scan-PCO (n=200) as well as a group of scan-normal women (n=29). No significant difference was found between subjects with bilateral and unilateral scan-PCO suggesting that these 2 groups are biochemically similar. The existence of unilateral scan-PCO suggests that PCOS may be a primary ovarian disorder.

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Keywords: Polycystic ovary syndrome, Unilateral polycystic ovary, Primary ovarian disorder.

INTRODUCTION

Ultrasound evidence of PCO (scan-PCO) is common and may be associated with no clinical symptom[1] ranging to severe symptoms.[2] The latter group is more likely to seek treatment. Therefore, in clinical practice this group is likely to be over-represented. On the other hand, the number of women who may be undergoing PCO changes and do not have clinical symptoms, remains unknown. So far, several studies have examined the prevalence of PCO. One used hospital staff,[1] a second study randomly collected subjects from a general practice[3] and other more recent studies were based on a randomized population.[4,5] All of these studies reported the prevalence of PCO to be 20-24% but have not mentioned the prevalence of unilateral PCO. Furthermore, it is not known whether biochemical abnormalities are always associated with bilateral PCO or if unilateral PCO also can cause those changes. Unilateral polycystic ovaries have been recognized in a case report,[6] but their biochemical features have not been compared with those of bilateral PCO. This study aims to investigate the clinical and biochemical features of a group of subjects with unilateral scan-PCO.

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SUBJECTS AND METHODS

The 217 consecutive subjects attended the Ultrasound Department, Royal Hospital for Women, New South Wales University. In all these cases both ovaries could be clearly seen. Subjects were complaining of amenorrhea, oligomenorrhea, hirsutism or acne. All the subjects were interviewed and their menstrual history was recorded. Then they were examined and scored for acne (using the Marynick score)[7] and hirsutism (using the Ferriman-Gallwey score).[8] Their height and weight were measured and body mass index (BMI, kg/m^2) calculated. A BMI more than 25 kg/m^2 was considered obese. Oligomenorrhea was defined as less than 8 cycles per year and amenorrhea as 0 to 2 cycles per year. The age range of the group was 15 to 40 years. Subjects with follicle stimulating hormone (FSH) levels > 20 U/L and hyperprolactinemia (> 20 ng/mL) were excluded from

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Table I. A comparison between clinical features of subjects with unilateral and bilateral scan-PCO.

Clinical features	Bilateral scan-PCO (n=200)	Unilateral scan-PCO (n=17)	*p*
Menarche	13.03 (±1.64)	13.06 (±1.48)	0.94
Cycle/year	7.56 (±4.79)	9.06 (±5.65)	0.30
Acne score	0.53 (±0.94)	0.92 (±0.42)	0.02
Hirsutism score	3.98 (±5.04)	3.53 (±5.73)	0.75

Table II. Comparison between the normal group and 2 groups of unilateral and bilateral scan PCO.

Parameters	Bilateral scan-PCO (n=200)	Unilateral scan-PCO (n=17)	Scan-normal (n=29)	$p\alpha$	$p\beta$
BMI (kg/m^2)	23.92 (±0.29)	22.23 (±0.07)	22.94 (±0.07)	NS	NS
LH (U/L)	5.71 (±1.17)	4.04 (±1.12)	3.69 (±0.18)	0.05	NS
FSH (U/L)	5.15 (±0.30)	5.81 (±0.11)	7.18 (±0.35)	0.01	NS
T (nmol/L)	1.88 (±1.06)	1.49 (±0.80)	1.23 (±0.51)	0.01	NS
SHBG (nmol/L)	37.15 (±1.90)	34.67 (±1.62)	51.29 (±1.45)	0.05	NS
DHEAS (µmol/L)	7.13 (±0.40)	7.18 (±0.34)	4.88 (±0.40)	0.01	NS
FAI	5.34 (±1.54)	4.28 (±0.88)	2.53 (±0.20)	0.05	NS

$p\alpha$: scan-normal group compared with other groups using ANOVA test.
$p\beta$: a comparison between two groups of women with bilateral and unilateral scan-PCO using Student's t-test.

the study. Transvaginal ultrasound was performed using a DIASONICS SPECTRA machine with a 7.5 MHz curved linear array. The ovaries were measured in 3 planes and the volume was calculated using the formula: length × width × thickness × 0.5. PCO was defined according to Adam's criteria,[9] that is, the existence of 10 or more peripheral follicles (2-8 mm in diameter) associated with an increase in ovarian stroma. The sonographer was blinded to the patient's biochemical or clinical results.

A blood sample was taken during the early follicular phase (days 1 to 7 of the menstrual cycle) and the following biochemical tests were performed: luteinizing hormone (LH), sex hormone binding globulin (SHBG), testosterone (T), dehydroepiandrosterone sulphate (DHEAS), prolactin (PRL), FSH and 17-hydroxyprogesterone (17-OHP). If the base level of 17-OHP was greater than 4 nmol/L then a Synacthen test was performed to exclude cases with congenital adrenal hyperplasia. The method of measurement and the interassay precision has been published.[10] The free androgen index (FAI) was calculated using the formula: FAI = T × 100/SHBG. A group of subjects with scan proven normal ovaries who attended the gynecology outpatient clinic for a routine check-up was chosen as a control group (n=29). These subects had regular cycles and no sign of hirsutism or acne.

Comparison between the groups was made using Student's t-test unless more than 2 groups were compared, in which case ANOVA was used. A p value of less than 0.05 was considered significant. The mean ± standard deviation (SD) was derived for each trait.

RESULTS

Of the 217 subjects who underwent a transvaginal ultrasound, 17 (8%) had unilateral scan PCO. Ninety-four percent (16 out of 17) of these subjects had at least one abnormal biochemistry to collaborate the ultrasound results. The mean BMI (± SD) was 23.92 (±0.29) kg/m^2 and it

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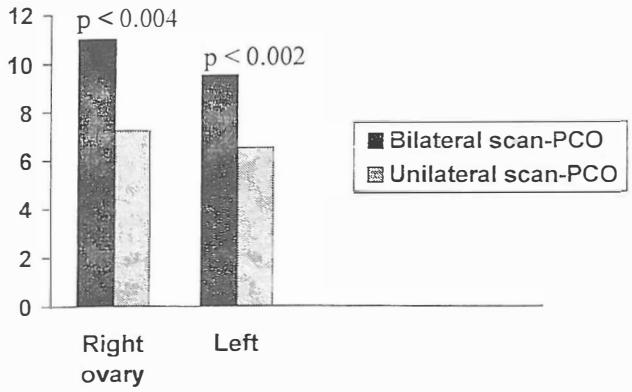

Fig. 1. A comparison between ovarian volume of subjects with unilateral (n=17) and bilateral scan-PCO (n=200).

ranged between 19.4 to 27.9 kg/m^2. Three subjects were obese (BMI > 25 kg/m^2). Twenty-four percent (4 out of 17) of subjects were hirsute (Ferriman-Gallwey score > 6) and 35% (6 out of 17) had acne (Marynick score > 2). Four subjects had amenorrhea and 2 were oligomenorrheic.

Clinical features of women with unilateral scan-PCO were compared with those of women with bilateral scan-PCO (Table I). Using Student's t-test no significant difference was found between the two groups except for the acne score which was found to be significantly higher in subjects with unilateral scan-PCO.

Table II summarizes the biochemical features of patients in the two groups of bilateral and unilateral scan-PCO when compared with a scan proven normal group. The results suggest that scan-normal subjects had significantly lower LH, T, DHEAS and FAI than other groups (p <0.05 and 0.01). The levels of FSH and SHBG were significantly higher in the control group compared to the others (p<0.05).

The biochemical results for the unilateral scan-PCO subjects were found to be similar to those with bilateral scan-PCO. The endocrine evaluation of subjects with unilateral scan-PCO shows that the mean values of T, LH, FAI and FSH were intermediate between subjects with bilateral PCO and scan-normal subjects (Table II).

Fig. 1 shows a comparison between ovarian volume of women with unilateral and bilateral scan-PCO. It is shown that left and right ovarian volume are significantly lower in subjects with unilateral scan-PCO compared with subjects with bilateral scan-PCO.

DISCUSSION

The pathophysiology of PCO is unknown. Some investigators have suggested that abnormal secretion of gonadotropins may lead to disturbances in ovarian secretion.[11,12] Others, however, emphasized on the role of the ovary and some intra-ovarian factors which may play an autocrine role in women with PCO.[13,14] The existence of unilateral PCO may well suggest that intra-ovarian factors, at least for some cases, may cause PCOS. In our study group, the incidence of unilateral scan-PCO was found to be around 8%. Clinical features were found within this group with the following incidence: oligomenorrhea 12%, amenorrhea 24%, hirsutism 23% and acne 35%. A comparison between subjects with bilateral scan-PCO and those with unilateral scan-PCO showed no significant difference in biochemical measurements. The difference in left and right ovarian volume between the 2 groups may be due to the fact that unilateral PCO appears first and when the condition develops, ovarian volume increases and both ovaries manifest an increase in size and volume.

In conclusion, the presence of unilateral scan-PCO suggests that PCO may primarily be an ovarian disorder. Subjects with unilateral scan-PCO have the same biochemical features as those with bilateral scan-PCO. Thus, the diagnosis of PCO may also include those with unilateral scan-PCO as well as those with manifestations of PCO in both ovaries.

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