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■ Original Research Article

Polycystic Ovary Syndrome: Prevalence and Phenotypic Characteristics in Women in Kano, Northwest Nigeria.

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Abstract

Background: Polycystic ovary syndrome (PCOS) is a common reproductive and endocrine disorder that is found in 6 -10% women, presenting with menstrual abnormalities, hyper-androgenism and polycystic ovaries. One of the complications of PCOS is metabolic syndrome. Based on the Rotterdam criteria for diagnosis, 3 phenotypes of PCOS exist: the Classical, hyperandrogenic-anovulatory, ovulatory and the normoandrogenic types, each with different cardiometabolic risk profile. There is paucity of studies on the prevalence of PCOS in this locality and the different phenotypes in the country. **Aim:** The aim of this study was to determine the prevalence and phenotypic characteristics of PCOS in Women of reproductive age in the state. **Settings and Design:** A cross sectional study was conducted on 597 women (18-45years) that attended the Gynecologic clinics at 2 institutions during the period. **Methods and Material:** Patients with Anovulation and clinical hyperandrogenism were recruited consecutively. Their clinical, anthropometric, biochemical and ultrasound indices were obtained. Statistical analysis used: Data was analyzed with MINITAB express for MAC. Measured variables were expressed in descriptive statistics. Tests of association for qualitative variables were performed using the chi-square test. **Results:** Polycystic ovary syndrome had a prevalence of 6.2%. Classical type was present in 67.6%, while the normo-ovulatory type was present in 2.7%. About 70% were overweight. Abnormal waist circumference was found in 48.6% of the clients. **Conclusions:** PCOS had a prevalence of 6.2%, with classical type being the most common. Abnormal waist circumference, a marker of metabolic risk was present in almost half of the cases.

Keywords: PCOS, Phenotypes, Cardio- metabolic risk.

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is a disorder that presents with ovarian dysfunction and endocrine abnormalities, associated with hyperinsulinaemia and metabolic disease. It occurs in 6 -10% of women.[1,2]

In 2012, the different phenotypes were recognized.[3] Identification of specific phenotypes for each patient was recommended, due to their different cardio-metabolic risks.[3,4]

Four phenotypes have been described; The Classic phenotype: hyper androgenism, anovulation and polycystic ovarian morphology. The ovulatory phenotype: hyperandrogenism, polycystic ovarian morphology and ovulatory cycles. The hyperandrogenic anovulatory phenotype, with normal ovarian morphology. The normo-androgenic phenotype: anovulation and polycystic ovaries.

We determined the prevalence of PCOS and phenotypic characteristics.

SUBJECTS AND METHODS

A cross sectional study was conducted in the Departments of Obstetrics and Gynaecology on women who presented newly to the Gynaecologic clinics of Aminu Kano Teaching Hospital (AKTH), and Murtala Muhammad Specialist Hospital (MMSH), Kano over a 4-month period (18/07/2017- 20/11/17).

Eligible patients were consenting women aged between 18-45 years with any of the following:

1. A history of anovulation (oligo/amenorrhea)
2. Clinical features of hyperandrogenism (alopecia, hirsuitism, acne)

Exclusion Criteria

1. Patients <18 or > 45 years old
2. Patients with features of thyroid disease
3. Diabetics
4. History of use of combined oral contraceptives, anti-androgens or glucocorticoids in the past 6 months.
5. Non-consenting patients
6. Women with Cushingoid features
7. Virilising Features (indicating androgenic tumors or CAH)
8. Total Testosterone levels > 12ng/ml (Suggestive of androgenic tumor/ CAH)
9. FSH >15mIU/ml (Suggestive of premature ovarian failure)
10. Hyperprolactinemia
11. Hypothyroidism

Ethical clearance was obtained from the research and ethics committee of both institutions. Informed consent, Confidentiality and other aspects of the Helsinki declaration were strictly adhered to.

Study participants were recruited consecutively as they presented newly to the Gynaecologic clinics. Two trained research assistants duly obtained informed consent after consultation.

A structured Proforma was used to obtain information on the clients' biodata as well as their socio-demographic data, information on their pubertal, menstrual, and reproductive history, relevant medical history, previous PCOS diagnosis and related treatment, and the presence of any hyperandrogenic symptoms. Anthropometric measurements were determined including the body weight, height and waist circumference (WC). Body weight was measured to the nearest 0.5kg using Seca® scale in light clothing; height was measured barefoot to the nearest 0.1cm using a Seca® stadiometer, while the WC was obtained as the smallest circumference at the level of the umbilicus in centimetres using a non-elastic tape. The Body mass index (BMI) was calculated as weight in kilograms divided by the square of the height in meters square (Kg/m^2). Clinical examination was carried out on all patients to verify the presence of hirsuitism, androgenic alopecia and significant acne. The presence of acanthosis nigricans was also noted, as it is a cutaneous marker of insulin resistance.

All blood samples were taken on the second or third day of a spontaneous or progesterone induced menstrual cycle to measure FSH, LH, testosterone, prolactin and TSH. Thyroid stimulating hormone and prolactin were assayed to exclude thyroid disorders and hyperprolactinaemia. Blood samples (7ml) were collected by venepuncture of the ante-cubital vein using sterile 10ml disposable syringe and 21G hypodermic needle after swabbing the site with methylated spirit without applying a tourniquet.

The samples (5mls) were allowed to clot within 30 minutes and centrifuged at 4000rpm using a Hettich centrifuge bench centrifuge for 10 minutes to separate the sera from the cells. They were carefully decanted into plain serum containers and frozen at −20°C until time for analysis.

Samples were analyzed for TSH, FSH, LH, Total Testosterone and prolactin. Testosterone, TSH, prolactin, FSH and LH were measured using the ichroma™ reader.

Transvaginal ultrasonography (TVS) was conducted on all patients on the same day of sample collection to determine the presence of polycystic ovarian morphology using the 6.5 MHz endo-luminal transvaginal transducer of Mindray biomedical Electronics Limited China, (Model 6CVI)

Outcome measures:

1. Proportion of patients with anovulation
2. Proportion of patients with clinical hyperandrogenism
3. Proportion of patients with high serum testosterone
4. Proportion of patients' polycystic ovarian morphology

Data obtained was recorded on the Proforma designed for the study and thereafter entered into the MINITAB express for MAC OS. Measured variables were expressed in descriptive statistics; variables were summarized using mean and standard deviation or median and inter quartile range, percentages and proportions as applicable. Tests of association were done using the non- parametric chi-square test. (p- Value was set at < 0.05)

RESULTS

A total of 597 new patients presented to the two clinics during the study period. Out of these, 60 patients had clinical features of PCOS, but only 46 met the inclusion criteria and were subsequently recruited as study participants. Following hormonal analysis, nine patients were excluded due to elevated serum prolactin and thyroid stimulating hormone, 37 samples were eventually analysed. Thus, the incidence of PCOS over the study period was computed to be about six percent (6.2%.) among new gynecology clinic attendees.

Table 1 shows the socio-demographic characteristics of the study population.

Almost all (36 patients, 97.3%) had a cycle length of more than 35 days. Of the 36 patients, eight women (21.6%) were amenorrhoeic. Of the 36 patients with PCOS, hirsuitism was present in 18 (48.6%), while severe acne was present in 12 (31.6%). Seven women (18.9%) had been previously diagnosed with PCOS but were not currently on medication (>6 months). Two (5.4%) women reported a sister to have had irregular menstrual periods but were never clinically diagnosed with PCOS.

The mean Body mass index (BMI) in the participants was 28.1 ± 6.4 kg/m^2, with a range of 15.6 - 43.2kg/m^2 while waist circumference.

Table 1: Socio-demographic characteristics of the study population

Variable	Frequency (%)
*AGE (*years)	
15-24	13 (35.1)
25-34	20 (54.1)
35-44	4 (10.8)
≥ 45	--------
TRIBE	
Hausa	33 (89.2)
Yoruba	3 (8.1)
Igbo	----
Others	1 (2.7)
LEVEL OF EDUCATION	
None	3 (8.1)
Informal	5 (13.5)
Primary	8 (21.6)
Secondary	12 (32.4)
Tertiary	9 (24.4)
MARITAL STATUS	
Single	3(8.1)
Married	33 (89.2)
Separated/ widowed/ divorced	1 (2.7)
OCCUPATION	
Unemployed /housewife	18 (48.7)
Civil servant	8 (21.6)
Self-employed/ others	11 (29.7)

Table 2: Clinical, Biochemical and Sonographic features of the Study Population

Variable	Number (%)
Anovulation	36 (97.3)
Hirsutism	18 (48.6)
Acne	12 (31.6)
Hyperandrogenemia	25 (67.6)
Acanthosis nigricans	2 (5.4)
Poycystic ovarian morphology	29 (78.4)

averaged 90.1 ± 13.8 cm, with a range of 60.0-12.0 cm. Hyperandrogenaemia (raised testosterone levels) was present in 25 (67.6%) women. The median testosterone value was 1.268 ng/mL IQR 0.8-1.0 ng/mL.

Table 3: Phenotypic Distribution of the Study Population

Variable	Number (%)
Classic type I	25 (67.6)
Hyperandrogenic type II	4 (10.8)
Ovulatory type III	1 (2.7)
Normo-androgenic type IV	7 (18.9)

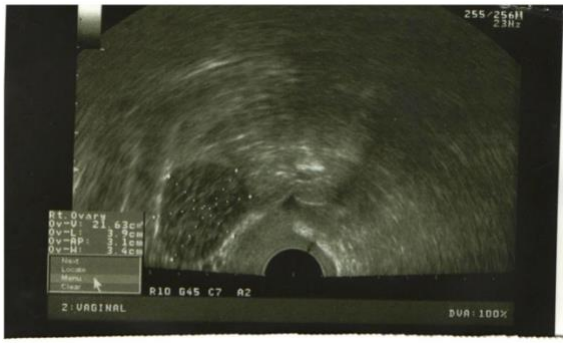

Figure1: Polycystic ovarian morphology

The clinical, biochemical and ultrasonographic features of the study population are illustrated in table 2, while Table 3 shows the phenotypic distribution of the study population.

DISCUSSION

This is the first study in our locality that attempted to characterize PCOS into different phenotypes.The prevalence of PCOS using the Rotterdam criteria was found to be 6.2%. This is much higher than the finding of 2.2% by Igwegbe et al,[5] in Southwest Nigeria, which was conducted amongst women visiting their Gynaecologic outpatient department. The current study was a two-centre type, and this could account for the difference in incidence. Ugwu et al[6] and Omokanye et al. [7] reported higher incidence than that of this study. A plausible explanation for this could be because they narrowed the population to infertile patients only as opposed to all women presenting to the gynaecologic clinic in this study.

We also found that almost all the women were anovulatory (cycle length of ≥ 35 days), thus no further test of ovulation was necessary. Kumapareli et al[8] also observed similar findings. The American association of clinical endocrinologists in association with the androgen excess society in their 2015 current best practices stated that once cycle length is greater than 35 days, it is assumed that anovulation is present, and no further tests of ovulation are necessary.[9]
In this series, polycystic ovarian morphology (PCOM) was present in most patients with PCOS. Similar results were obtained by Panidis et al.[10] and Li et al.[11]

Ogueh et al[12] reported a much lower incidence of PCOM, probably because the study population was not limited to PCOS but included all women undergoing a pelvic ultrasound scan.
Our finding of biochemical hyperandrogenaemia from this study concurred with the findings of Cedars et al [12], Knochenhauser et al.[13] and Moghettini et al. [14]

Upon constellation of these individual characteristics, the classical phenotype was the commonest, followed by the normoandrogenic phenotype, while the ovulatory was the least common phenotype. Li et al.[11], Moghettini et al.[14], Panidis[14], Chai et al.[15] also found the classical phenotype to be the commonest.

Abnormal waist circumference as a feature suggestive of metabolic complications was present in almost half of the clients. This implies that up to 50% of patients with PCOS might end up with metabolic complications. Polycystic ovary syndrome is a fairly common endocrine disorder in our environment. The classical phenotype, which is thought to have the greatest metabolic potential, was found to be the commonest.

There are weaknesses in this study. The prevalence of PCOS in this study, might not reflect the true prevalence of PCOS in the community as this is a hospital-based study. Also, Total testosterone was assayed rather than free testosterone.

There is a need to determine the risk of metabolic syndrome across these phenotypes to provide effective screening and preventive measures against metabolic complications.

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