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Original Research Article

Prevalence and phenotypic features of polycystic ovary syndrome among patients attending gynaecology clinic in two referral hospitals in Yaoundé, Cameroon

Jean Dupont Ngowa Kemfang[1]*, Jacques Yann Omgba Omgba[1], Esther Um Ngo[1], Cyrille Armel Nono Chebu[1], Jovanny Tsuala Fouogue[2], Ombaku Kingsley[1], Sobngwi Eugène[3]

[1]Department of Obstetrics and Gynecology, [3]Department of Endocrinology, Faculty of Medicine and Biomedical Sciences of the University of Yaoundé 1, Yaoundé, Cameroon
[2]Department of Obstetrics and Gynecology, Faculty of Medicine and Pharmaceutical Sciences of the University of Dschang, Dschang, Cameroon

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***Correspondence:**
Dr. Jean Dupont Ngowa Kemfang,
E-mail: jdkemfang@yahoo.fr

ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is a common gynaecological endocrine disease in women at reproductive age. This study aimed to determine the prevalence and phenotypes of PCOS among women attending gynecology clinic at the two referral hospitals in Yaoundé.
Methods: It was a cross sectional retrospective study involving women attending the gynecology clinic of two referral hospitals in Yaoundé, Cameroon from January 2016 to March 2018. The socio-demographic information, clinical and laboratory characteristics of each patient were collected from the medical files.
Results: A total of 143 patients diagnosed with PCOS were included. The prevalence of PCOS was estimated at 3.5%. The mean age of patients was 29.18±4.5 years with a range of 17 to 41 years. Most patients were either overweight (31.7%) or obese (43%) and 0.7% patients were underweight. The most frequent presentations of PCOS patients were infertility (74.1%), oligomenorrhea/amenorrhea (68.5%), hirsutism (62,9%) and acne (20.3%). The different phenotypes represented were classical phenotype A: 69% (99/143), phenotype B: 17% (24/143), phenotype C: 09% (13/143) and phenotype D: 05% (07/143). Medical treatment (76.9%) and general measures (23.1%) were the most frequent therapeutic options among PCOS patients. In vitro fertilization (08.4%) and surgical drilling (07%) was also used.
Conclusions: Prevalence of PCOS in our setting is 3.5%. The classical phenotype A is the most common. It is important to think about PCOS in women attending gynecology clinic.

Keywords: Polycystic ovary syndrome, Hyperandrogenism, Amenorrhea, Oligomenorrhea, Infertility

INTRODUCTION

PCOS is a common gynaecological endocrine disease in women of childbearing age.[1,2] PCOS was first reported in modern medical literature by Stein and Leventhal who, in 1935, described seven women suffering from amenorrhea, hirsutism and enlarged ovaries with multiple cysts.[3] PCOS is characterized by hyperandrogenism, ovulatory dysfunction and polycystic ovaries. Women with PCOS often seek care for menstrual disturbances, clinical manifestations of hyperandrogenism and infertility.[4] The ultrasonographic diagnosis of polycystic ovaries requires the visualization of 12 or more follicles measuring 2-9 mm or the presence of at least one ovary larger than 10 cm^3.[4,5] The European society for human reproduction and embryology and American society for reproductive

medicine (ESHRE/ASRM or Rotterdam) guidelines on diagnostic criteria for PCOS requires the patient to have two of three of the following: oligo or chronic anovulation; clinical and/or biochemical signs of hyperandrogenism; polycystic ovaries.[5]

However, there is considerable interindividual variations in presentation.[6] All these features may be present to different degrees and various combinations, thus leading to a wide spectrum of phenotypes.[6] Using the possible combinations of the Rotterdam criteria, four different phenotypes of PCOS are identified: hyperandrogenism (clinical or biochemical) plus chronic anovulation; hyperandrogenism plus polycystic ovaries but with ovulatory cycles; chronic anovulation plus polycystic ovaries without clinical hyperandrogenism and finally, the triad of hyperandrogenism, chronic anovulation and polycystic ovaries.[5,7,8]

The prevalence of PCOS varies widely across the globe and the population under study. This depends on ethnicity, race, environment and the criteria used to make diagnosis of PCOS.[9,10] Globally, the prevalence of PCOS was 4-8%.[11-15] However, few studies in Sub Sahara Africa reported the prevalence of 16% to 32%.[16,17] The aim of this study was to determine the prevalence and phenotypes of PCOS among women attending gynecology clinic in two referral hospitals in Yaoundé.

METHODS

This study was a cross-sectional study with retrospective data collection involving women attending the gynecology clinic of two referral hospitals in Yaoundé, Cameroon, the gynaecological endoscopic surgery and human reproductive teaching hospital (CHRACERH) and the Yaoundé gynaeco-obstetrics and paediatrics hospital (HGOPY), from January 2016 to March 2018. We included all medical files of patients with the diagnosis of PCOS based on the presence of at least two of three criteria of the 2003 Rotterdam consensus for PCOS diagnosis. Ethical clearance was obtained from the institutional review board of the faculty of medicine and biomedical sciences of the university of Yaoundé I and research authorization obtained from the directorate of the above-mentioned hospitals. Thereafter, we collected data from patients' files. The socio-demographic information, clinical and laboratory characteristics of each patient was collected. The data collected included age, ethnic group, occupation, menstrual history, oligomenorrhoea defined as menstrual cycles longer than 35 days, amenorrhea (absence of menstrual period during more than 3 months), height (m), weight (kg), body mass index (BMI), clinical signs of hyperandrogenism (hirsutism, acne and alopecia), infertility, psychological symptoms (anxiety/depression). Paraclinical data (PCO on transvaginal ultrasound scan, testosterone level, lutening hormone (LH) level, follicle stimuling hormone (FSH) level, estradiol level and anti-Mullerian hormone (AMH) level. Therapeutic modalities (general measures, medical treatment, ovarian drilling surgery, in vitro fertilization (IVF).

Data collected was entered in CSPro 7.3 and analysed with SPSS 23.0. Data was presented as frequencies, proportions and mean±SD. Statistical significance was considered at the 95% confidence level ($p<0.05$). Considering the Rotterdam 2003 PCOS diagnostic criteria, we classified the study population into 4 phenotypic groups: classic phenotype A (hyperandrogenism, anovulation and polycystic ovaries); phenotype B (hyperandrogenism and anovulation); phenotype C (hyperandrogenism and polycystic ovaries); phenotype D (anovulation and polycystic ovaries).

RESULTS

A total of 143 patients diagnosed with PCOS were included in this study, 109 at CHRACERH and 34 at HGOPY. From the total number of patients (4086) who consulted at the gynecology clinic during the study period, we estimated the hospital frequency of PCOS at 3.5%. Table 1 shows the baseline characteristics of the study population. The mean age of women in this study was 29.18±4.5 years with a range of 17 to 41 years. Majority of the women (69.2%) were within the 25-35 years age range. All ethnic groups found in Cameroon were affected with a predominance of the Bantus ethnic group (52.4%). Most women (65.1%) were employees or employers. Most patients were either overweight (31.7%) or obese (43%) and 0.7% patients were underweight.

Table 2 presents distribution of patients according to clinical presentation and paraclinical findings. The most frequent presentations of PCOS patients were infertility (74.1%), oligoamenorrhea/amenorrhea (68.5%), hirsutism (62,9%) and acne (20.3%). PCO was diagnosed on endovaginal ultrasonography in 82.5% patients and LH/FSH >1 was found in 70% of patients.

Table 3 shows the serum hormone levels of the study population. The mean testosterone value was 1.38±2.43 ng/ml, more elevated than normal value for women of 0.24-0.47 ng/ml. Mean AMH was 8.38±5.59 ng/ml, more than two time the normal female value of 0.7-3.5 ng/ml. Mean FSH (5.51±4.09 UI /l) and mean LH (9.65±8.4 UI/l) levels were within the normal range for females.

Figure 1 illustrates the distribution of PCOS patients according to phenotype. The different phenotypes represented in the studied population were classical phenotype A: 69% (99/143), phenotype B: 17% (24/143), phenotype C: 9% (13/143) and phenotype D: 5% (07/143).

Table 4 presents the distribution of PCOS patients according to the treatment modalities. Medical treatment (76.9%) and general measures (23.1%) were the most frequent therapeutic options among PCOS patients. In vitro fertilization (08.4%) and surgical drilling (07%) was also used.

Table 1: Baseline characteristics of the study population.

Variables	Number, n=143	%
Age (years)		
15-25	25	17.5
25-35	99	69.2
35 - 45	19	13.3
Occupation		
Student	38	26.6
House women	12	08.4
Employee	69	48.3
Employer	24	16.8
Ethnic origin		
Bantu	75	52.4
Semi-bantu	51	35.7
Sudanese	17	11.9
BMI		
<18.5 (underweight)	01	0.7
18.5-25 (normal)	35	24.6
25-30 (overweight)	45	31.7
>30 (obese)	62	43.0

BMI: body mass index.

Table 2: Distribution of patients according to symptoms and paraclinical findings.

Variables	CHRACERH (n=109)	HGOPY (n=34)	Overall (n=143)	P value
	N (%)	N (%)	N (%)	
Oligomenorrhea/amenorrhea	64 (58.7)	34 (100)	98 (68.5)	0.000
Clinical hyperandrogenism				
Hirsutism	66 (60.5)	24 (70.5)	90 (62.9)	0.1
Acne	13 (11.9)	16 (47.0)	29 (20.3)	0.000
Alopecia	0 (0)	1 (2.9)	01 (0.7)	0.1
Infertility	100 (91.7)	6 (17.6)	106 (74.1)	0.000
Psychological symptoms				
Anxiety/depression	1 (0,91)	6 (17.6)	7 (4.9)	0.001
PCO on endovaginal US	-	-	118 (82.5)	
LH/FSH > 1	-	-	100 (70)	

PCO: polycystic ovary; LH: lutening hormone; FSH: follicle stimuling hormone; US: ultrasound.

Table 3: Serum hormone levels of the study population.

Hormones	Normal value	Mean	Ecart type	1st quartile	3rd quartile
FSH (UI/l)	3-9	5.51	4.09	4.35	6.3
LH (UI/l)	2-10	9.65	8.40	4.75	12.4
Estradiol (pg/ml)	27-161	55.75	30.89	30	81.10
AMH (ng/ml)	0.7-3.5	8.38	5.59	4.46	11.30
Testostérone (ng/ml)	0.24-0.47	1.38	2.43	0.27	1.02

LH: lutening hormone; FSH: follicle stimuling hormone; AMH: anti Mullerian hormone.

Table 4: Distribution of patients according to the treatment modalities.

Therapeutic modality	CHRACERH (n=109)	HGOPY (n=34)	Overall (n=143)	P value
	N (%)	N (%)	N (%)	
General measures	26 (23.5)	7 (20.5)	33 (23.1)	0.3

Continued.

Therapeutic modality	CHRACERH (n=109)	HGOPY (n=34)	Overall (n=143)	P value
	N (%)	N (%)	N (%)	
Medical treatment	82 (75.2)	28 (82.3)	110 (76.9)	0.2
Surgical treatment (drilling)	10 (9.1)	0 (0)	10 (7)	0.02
IVF	12 (11)	0 (0)	12 (8.4)	0.01

IVF: in vitro fertilization.

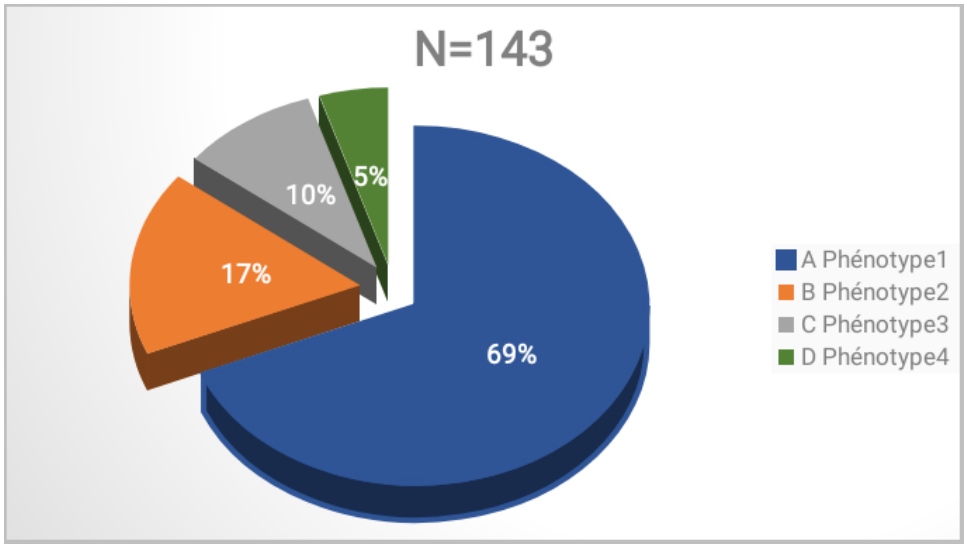

Figure 1: Distribution of patients according to the phenotypes of PCOS.

DISCUSSION

This study showed that the frequency of PCOS among women attending gynecology clinic in two referral hospitals in Yaoundé was 3.5%. This was lower than the 4-8% that found in literature and especially the 20 to 30% frequency reported in several African studies.[11-17] Most of these reports reflected the PCOS prevalence in the general population or in special populations such as infertile women and not in women who attended the gynecology clinics in hospitals. Also, this variation with several other studies may be due to racial or ethnic differences or the difference in the criteria for the diagnosis of PCOS used.

The clinical presentation of PCOS varied widely. Women with PCOS often seek care for menstrual disturbances, clinical manifestations of hyperandrogenism and infertility.[4]

This study showed that infertility (74.1% in overall and 91.7% in CHRACERH) was the most frequent clinical manifestations among PCOS patients. These results were similar to those of previous studies conducted in Nigeria in which inability to conceive (83.9%) was the most common presentation.[18] The similarity in these two studies was that CHRACERH was a center specialized in infertility management in Cameroon as well as the Nigerian study which was conducted among women attending an infertility clinic.

Hirsutism was a common clinical presentation of hyperandrogenism occurring in up to 70% of women with PCOS.[19,20] Consistent with literature, this study reported a frequency of hirsutism of 62.9% among patients with PCOS. However, some authors reported a low frequency (28% to 35%) of hirsutism in Asian women with PCOS.[21] This could be attributed to the ethnic variation in the expression of PCOS phenotypes.

Menstrual disturbances commonly observed in PCOS included oligomenorrhea, amenorrhea and prolonged erratic menstrual bleeding.[22] In this study, oligomenorrhea and amenonorrhea were reported in 69% of women.

According to the Rotterdam criteria, obesity was not essential to make the diagnosis of PCOS, however, obesity was common in women who had PCOS, women with PCOS hada greater risk of overweight and obesity.[23] As found in the literature, the large majority (74.7%) of patients in this study were overweight or obese.

The introduction of the new PCOS phenotypes by the Rotterdam criteria generated a debate regarding the long-term sequelae of PCOS in the broad phenotypic spectrum of the syndrome. The classic PCOS phenotype as defined by the National institute of health (NIH) criteria appeared to display an unfavorable hormonal and metabolic profile associated with a clustering of cardiovascular risk factors.[8] The classical PCOS phenotype in this study was the most

frequent (69%). This reinforced the idea of long-term monitoring of PCOS patients in our setting because to the associated risk of metabolic and cardiovascular complications.

The choice of treatment for women with PCOS depended on the symptoms with which a patient presented.[24] Weight loss was recommended as first-line therapy for the management of infertility in overweight and obese women with PCOS. Clomiphene citrate was the first drug of choice for ovulation induction in women with PCOS. Ovulation induction with gonadotropins and laparoscopic ovarian drilling (LOD) were considered to be second line therapies for ovulation induction by the ESHRE/ASRM. *In vitro* fertilization (IVF) was recommended as third-line therapy for the management of infertility by the 2008 Thessaloniki ESHRE/ASRM-sponsored PCOS consensus workshop group.[25]

In this study, the management of PCOS was consistent with the recommendations in medical literature. General measures including weight loss and medical treatment were the most frequent modalities, reflecting the clinical features of obesity and infertility in the study population. Furthermore, ovarian drilling by laparoscopy and IVF were performed only in a few cases. It should also be noted that IVF remained limited in our setting because of its low accessibility and high cost compared to the socioeconomic level of the population.

The main limitation of this study was the retrospective nature of the data collection resulting in a risk of information bias.

CONCLUSION

The prevalence of PCOS in our setting is 3.5%. The classic phenotype A is the most common. Infertility and hirsutism are the two most frequent clinical manifestations of PCOS. It is important to think about PCOS in women attending gynaecology clinic and to consider long-term monitoring of these patients in view of the risk of long term associated metabolic and cardiovascular complications.

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