Caspian J Reprod Med, 2017, 3(1): 19-24

Caspian Journal of Reproductive Medicine

Journal homepage: www.caspjrm.ir

Original article

Assessing prevalence and clinical characteristics of polycystic ovary syndrome in young adults, Iran

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Received: 25 Apr 2017 Accepted: 05 Jul 2017

Abstract

Background: Studies have revealed that Polycystic Ovary Syndrome (PCOS) usually begins in adolescence and it might manifest differently in different populations. The aim of this study was to estimate prevalence and clinical characteristics of PCOS in a community setting in Iran.

Methods: In a community-based cross-sectional study 401 young women aged 18-33 years selected by cluster sampling proportionate to population size. An interviewer-administered questionnaire was used to screen predisposing factors for PCOS based on menstrual history and clinical manifestations of hyperandrogenism. PCOS be defined presence of least two criteria were considered diagnostic of PCOS, after exclusion of other etiologies.

Results: The overall prevalence of PCOS among young women was 19.0% (CI 95%; 15.0%, 23%). Compared with non-PCOS young women, The adjusted age OR of young women PCOS for problem in abnormal hair growth 5.07 (CI, 2.87-8.99; P< 0.0001) weight loss 4.72 (CI, 2.75-8.09; P< 0.0001), abdominal obesity was 1.83 (95% CI, 1.00 -3.11; p= 0.026), paternal alopecia was 1.760 (CI 95%, 1.03-3.02; p = 0.040), and consume pill for menstruation 18.75 (CI 95%, 6.53-53.96; p< 0.0001). There were no significant difference between acne, increased weight, and depression with PCOS. The women with regular cycles in the absence of clinical hyperandrogenism 98.9% were confirmed as normal. While 93.9 % women with irregular cycle and clinical hyperandrogenism were confirmed to have PCOS.

Conclusions: The results of this study indicated that counseling and evaluating of the women with irregular cycle and clinical hyperandrogenism using an interviewer-administered questionnaire may be benefit for diagnosis of PCOS.

Keywords: Polycystic Ovary Syndrome, prevalence Hirsutism, obesity

Introduction

Polycystic ovary syndrome is an endocrine disturbance, which its etiology still being explored (1-3). It is stated that prevalence of polycystic ovarian syndrome (PCOS) is critically depending on exact definition of use (4, 5). Organizations such as the National Institutes of Health (NIH), Androgen Excess-PCOS Society (AE-PCOS) criteria, and Rotterdam

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[DOI: 10.22088/caspjrm.3.1.19]

2003 have recommended some criteria for the diagnosis of PCOS based on oligo/amenorrhea, hyperandrogenism, clinical androgen excess, and polycystic ovarian morphology. Therefore, estimate prevalence is varied considerably in the different population. However, based on the definition by Rotterdam 2003, the prevalence of this condition varies in the different population. It is important to note that manifestations of PCOS are different in different population (6, 7). The definition by Rotterdam 2003 requires the exclusion of disorders that mimic PCOS and ultrasonographic evidence of polycystic ovaries (8). While in the National Institutes of Health defining investigation radiologic is not necessary in order to diagnosis. Thus, the propose of this definition is having oligo/amenorrhoea with clinical and/or biochemical hyperandrogenism, with exclusion of other mimicking etiologies (9). The practical definition AE-PCOS Society criteria is based oligo/amenorrhoea and clinical androgen excess (10). Recently, the Androgen Excess and PCOS (AE-PCOS) Society reported the third set of clinical criteria for PCOS. These criteria seems to be combination of the Rotterdam ultrasound criteria with hyperandrogenism for the diagnosis PCOS (11, 12).

Also PCOS is associated with range of disease such as diabetes, insulin resistance, dyslipidemia, infertility, abortion, and metabolic syndrome (13-15). However, ultrasonographic and biochemical evaluation give additional information, they add time and cost to clinical practice. In general, the definition by the National Institutes of Health criteria is easier to be used in clinical practice, because it does not require ultrasonographic evaluation. However, this criterion required to biochemical evaluation. Since there is limited in using ultrasound and biochemical assay for diagnostic of PCOS in Iran. Therefore we carried out a community-based cross-sectional study to estimate prevalence and clinical characteristics of PCOS in a community setting in Iran in order to find a simple screen predisposing factors for PCOS. For the purpose this study, PCOS is identified using Rotterdam 2003.

Materials and Methods

This research was approved by the ethics committee of the Medical Sciences University of Babol (No. MUBABOL. REC.1391.17). Informed written consent was obtained all eligible subjects.

The study design was a community based cross sectional study. It was performed on 401 students of Babol Universities for defining clinical characteristics of Polycystic Ovary Syndrome in the period 2013 - 2014.

Required sample size was calculated using the formula "N" and base on expected proportion of 8.3 percent (16), a standard score of (Z) 95%, and precision level 3% (d). Since this study was systematic sampling and community based study, a design effect of 2.0 (a multiply of 2.0) and a non response rate of 30 percent was added. The required sample size was thus calculated to be 439. Using systematic sampling, we selected every five medical and Para medical faculty in the city. The sample size of each the faculty was proportionality allocated according to the number of women students in each the facility and required sample was selected randomly within each field and each grade.

Our inclusion criteria were included women non pregnant who were at least 2 years after menarche. A total of 38 students (6.7 %) did not participate or were pregnant who excluded in this study. The response rate was 93.4% (n = 401). After selection, demographic data, menstrual frequency, age at menarche, clinical history such as abnormal hair growth, obesity, acne lesions on the face, forehead and cheek, acanthosis nigricans, paternal alopecia, ovarian cyst, diabetes, depression disorder, and family history of diabetes, ovary cyst were recorded using a special designed check list.

Irregular menstrual was defined as a total of less than eight menses per year (17).

Anthropometry variables were measured, including weight, and waist circumference. Weight was recorded using digital scales, with the subjects minimally without shoes with a tape measure. The body mass index was calculated using the formula: BMI=weight (kg)/ height 2 (m) (18). Early age at menarche, defined as ≤11 years old (19).

The operational definition for PCOS was based on Rotterdam criteria 2003; after exclusion of thyroid or adrenal disorders, and hyperprolactinemia, PCOS was be determined when at least two of the three features were present: oligo/amenorhea, clinical and/or biochemical hyperandrogenism, or polycystic ovaries (8).

Descriptive statistics were used to describe baseline demographic and clinical characteristics of young women. To determine association between high risk factors associated with PCOS in young women, PCOS was considered as a dependent variable for logistic factors included pattern of menstrual period, hyperandrogenemia, hyperanderogenism, family

[DOI: 10.22088/caspjrm.3.1.19]

history of risk factors, and depression disorder height. P< 0.05 was considered statistically significant.

Results

The mean age was 21.2 ± 3.8 years (range 18 - 33 years). The mean age at menarche for all participants was 13.3 ± 1.3 years; percentage of earl women (≤ 11) was 5%. The mean age of waist circumference was 84.9±9.3 cm; percentage of abdominal obesity (> 88 cm) was 32.4%. The mean BMI was 23.0± 8.3 kg/m2; the percentages of women who were overweight (BMI: 25.0–29.9 kg/m2) and obese (BMI ≥ 30 kg/m2) were 24.0 and 10.2%, respectively.

The overall prevalence of PCOS among young women was 19.0% (CI 95%;15.0%, 23%), which 33 (8.2%) previously diagnosed cases already present and 43 confirmed newly diagnosed cases of PCOS based on the 2003 Rotterdam diagnostic criteria. The most common clinical characteristics of PCOS were irregular menstruation (93.4%), abnormal hair growth hirsutism (43.4%), and ovarian cyst (43.4%).

The mean (SD) age in years for women with PCOS compared to women without PCOS was 22.2 (3.8) vs 20.6 (2.6) (P <0.0001). The mean weight (<0.0001), waist circumference (<0.0001), and BMI (0.041) of the PCOS young women were higher than those of the no PCOS young women. There were significant differences between two groups according marital status. In PCOS group women with married women higher in comparing non PCOS women (Table 1).

Compared with non-PCOS young women, the OR of young women PCOS for problem in abnormal hair growth 5.074 (CI, 2.87-8.99 P<0.0001) weight loss 4.716 (CI, 2.749-8.092 P< 0.0001), abdominal obesity was 1.829 (95% CI, 1.00 -3.11; p= 0.026), paternal alopecia was 1.760 (CI 95%, 1.03-3.02; p = 0.040), and Consume pill for menstruation 18.775 (CI 95%, 6.53-53.96; p = 0.0001). There were no significant difference between acne, increased weight, and depression with PCOS (Table 2).

Of 227 students with regular cycles in the absence of clinical hyperandrogenism 98.9% were confirmed as normal. While 93.9 % women with irregular cycle and clinical hyperandrogenism were confirmed to have PCOS.

Discussion

In this study, based on Roterrdom 2003, the prevalence of PCOS to be 19.0% (95% CI: %, %) among women aged 18-33 years in Babol city. Our

Table 1. Baseline demographic and characteristics of the subjects according to PCOS (n =410).

Characteristics	Total (n =401) Mean ± SD	With PCOs (n =76) Mean ± SD	Without PCOs (n =325) Mean ± SD	p-Value
Age, years	21.2±3.8	22.2±3.8	20.6±2.6	<0.0001
Age at menarche, years	13.3±1.3	13.1±1.4	13.3±1.3	0.121
Height, cm	162.5±60.1	161.3±12.43	162.7±5.5	0.124
Weight, kg	60.1±10.8	64.9±12.2	58.9±10.1	<0.0001
Waist circumference, cm	84.9±9.3	88.9±9.4	84.3±9.0	<0.0001
BMI, kg/m ^{2}	23.0±8.3	26.4±17.3	22.3±3.6	0.041
Married women%	94 (23.5)	67 (20.6)	27 (35.5)	0.006
waist circumference(> 88 cm) (%)	127 (31.7)	35 (46.1)	92 (28.3)	0.003
Irregular menstruation,(%)	81 (20.2%)	71 (93.4)	10 (3.1)	<0.0001
History of used pill, %	69 (17.2)	15 (4.6)	54 (71.1)	<0.0001
Abnormal hair growth, (%)	76 (19.0)	33 (43.4)	43 (13.2)	<0.0001
Increased weight, (%)	101 (25.2)	78(24.0)	23 (30.3)	0.257
Weight loss problems	79 (19.7)	53 (16.3)	26 (34.2)	<0.0001
Early menarch ≤11	20(5.0)	6 (7.9)	14 (4.3)	0.157
Acne lesions, (%)	156 (38.9)	30 (39.5)	126 (38.8)	0.306
Acanthosis nigricans (%)	22(5.5)	6 (7.9)	16 (4.9)	0.306
Paternal alopecia (%)	113 (28.2)	31 (40.8)	82 (25.2)	0.007
Ovarian cyst (%)	33 (9.2)	33 (43.4)	0 (0.0)	<0.0001
Diabetes (%)	2 (0.5)	1 (0.3)	1 (1.3)	0.261
Depression disorder (%)	102(25.4)	24 (31.6)	78 (24.0)	0.172
Family history of diabetes (%)	146(36.4)	33(43.4)	113 (34.8)	0.158
Family history of ovary cyst (%)	82 (20.4)	19(25.0)	63 (19.4)	0.275

[DOI: 10.22088/caspjrm.3.1.19]

Table 2. High risk factors associated with PCOS in young women (n =401).

Factors	Adjusted odds ratio*	95% CI	p-Value
Irregular menstruation	18.23	11.98, 27.78	<0.0001
Abnormal hair growth	5.07	2.87-8.99	<0.0001
Acne	0.81	0.47-1.40	0.443
Consume pill for menstruation	18.78	6.53-53.96	0.0001
Weight loss problems	4.72	2.749-8.092	0.0001
Abdominal obesity (>88cm)	1.83	1.0 -3.11	0.026
Increased weight	1.25	0.707-2.208	0.444
Paternal alopecia	1.76	1.03-3.02	0.040
Depression disorder	1.34	0.767-2.345	0.303

*Adjusted; age

results were in agreement with a study in Turkey, in which authors reported a prevalence of PCOS in 19.9% of ages of women 18- 45 years using the same definition (7). While a number of surveys in Europe, Asia, and United States to estimate the prevalence of PCOS using the National Institutes of Health criteria were reported 6%–9% and according to the Rotterdam criteria is 12%–20% (8–11). Tehrani and colleagues (2011) in a study using the NIH definition, found a prevalence of PCOS 8.5% (95% CI: 6.8%, 10.2%) among women 18- 45 years in Tehran city, Iran (20). Other study of the prevalence of PCOS among adolescence in the same geographic location (Babol city) has found a lower prevalence of (8.3%) comparing the present study (21). Since the subjects were adolescents, the definition was very narrow; the Rotterdam criteria were used to determine PCOS with the presence of all three criteria, so this could be the possible reason for lower prevalence of PCOS in the study.

Several studies have reported abnormal menstrual pattern, android pattern of obesity, and hirsutism, common clinical features of PCOS (12, 22, 23). In our study irregular menstruation was the hallmark of PCOS, 93.4% women with PCOS had oligomenorrhoea. Azziz et al. (12) have shown that menstrual irregularity is a common feature of PCOS, occurring in more than 75% of the adult PCOS population. In our study, approximately 43.4% of PCOS women have excessive hair growth. The prevalence of PCOS in South East Asia reported an excessive hair growth hirsutism prevalence rate of 5% (24). Therefore our findings were nearly comparable with the findings in other countries data from the present study showed that PCOS women had hyperandrogenism with irregular cycle menstruation while regular cycles in the absence of clinical hyperandrogenism confirmed as normal. In addition, important features of PCOS were abnormal hair growth (5.1 folds), problem in decrease weight (4.72 folds), irregular menstruation (18.23 folds), and abdominal obesity (1.8 folds).

Conclusions

This study showed that the women with regular cycles in the absence of clinical hyperandrogenism 98.9% were confirmed as normal. While 93.9 % women with irregular cycle and clinical hyperandrogenism were confirmed to have PCOS. Therefore we conclude that most physicians readily diagnose many women with PCOS in clinic practice. Therefore, it is recommended that an interviewer-administered questionnaire was used to simple screen predisposing factors for PCOS based on menstrual history and clinical manifestations of hyperandrogenism.

Conflict of interest

The authors declare that they have no competing interests.

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[DOI: 10.22088/caspjrm.3.1.19]

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[DOI: 10.22088/caspjrm.3.1.19]