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CLINICAL PROFILE OF YOUNG ADULTS (18-24 YEARS) WITH POLYCYSTIC OVARY SYNDROME

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ABSTRACT **Background:** Polycystic Ovary Syndrome is a common endocrine problem with a heterogenous clinical picture. Early identification is essential to prevent metabolic problems and infertility. **Objective:** To estimate the prevalence of Polycystic Ovary Syndrome and depict the clinical profile of young adults (18-24 years) with Polycystic Ovary syndrome. **Methods:** A cross-sectional study of all the nursing students aged 18-24 years in Thiruvananthapuram District was conducted to self-screen for Polycystic Ovary Syndrome and Rotterdam criteria were applied. The study group comprised 529 subjects who were diagnosed to have the syndrome. The clinical and ultrasonographic characteristics and anthropometric variables of the study group were estimated and compared with 399 young adults without Polycystic Ovary Syndrome. **Statistical Analyses:** Variables were expressed in terms of frequencies for categorical and mean (± SD) for continuous variables. Chi-square test was used for categorical and t- test for continuous variables. **Results:** The prevalence of Polycystic Ovary Syndrome was 13.1%. Irregular periods was seen in 74.7%, hirsutism in 57.1%, acne in 37.1%, acanthosis nigricans in 51% and alopecia in 2.5%. Overweight and obesity were found in 30.8%, increased waist circumference in 16.1% and hypertension in 27.8%. **Conclusion:** Polycystic Ovary Syndrome is a clinically heterogenous condition with an increased prevalence of irregular periods, hirsutism, acne and acanthosis. Overweight and obesity are significantly increased. A younger age group of late adolescents or young adults is ideal to screen for the syndrome and institute lifestyle intervention to prevent metabolic problems.

KEYWORDS : Irregular periods, hirsutism, polycystic ovary syndrome and body mass index

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is the most common endocrinopathy in women of reproductive age and is recognised as a heterogenous disorder. Various definitions like the National Institute of Health criteria and Androgen Excess Society criteria have been used previously to define the syndrome (Zawadzki J, 1992; Aziz R, 2006). In 2003, PCOS was redefined by the Rotterdam criteria (2004) which have since been accepted as a reference standard worldwide.

The immediate symptoms and signs are menstrual disorders, hirsutism, acne, abnormal uterine bleeding, obesity and psychosocial problems. Apart from all this the main public health importance of PCOS today is the recognition that PCOS is a major cause of infertility and a fore runner of the metabolic syndrome with implications for diabetes and cardiovascular disease.

The prevalence of PCOS is consistently higher in South Asians and the Indian subcontinent (Mani H, 2015; Joshi B, 2014). The population of young adults aged 18-24 years was chosen because such studies are very few in India. Also, most guidelines suggest that it would be ideal to definitely diagnose PCOS only by the age of 18 (Teede HJ, 2018). Early diagnosis of PCOS is essential to determine individualised treatment targets by lifestyle management to prevent long term health consequences. Many women have reported dissatisfaction with delayed diagnosis of the syndrome (Gibson-Helm M, 2017).

OBJECTIVES

The present study is an attempt to estimate prevalence of PCOS and depict the clinical profile of young adults aged 18-24 years with PCOS.

SUBJECTS AND METHODS

This was a cross sectional study conducted among all the nursing students aged 18-24 years of Thiruvananthapuram District in Kerala. A sample size of 3308 was calculated taking a prevalence of 9.1% and an absolute precision of 1 and a type I error of 5% (Nidhi R, 2011). It was estimated that there were around 4100 students in Thiruvananthapuram district and hence it was decided to screen all the eligible students adopting a census method. All those who were between 18 and 24 years of age, unmarried, had menarche more than 5 years before the study and gave informed consent were included. Those who were on hormonal treatment or metformin for the last three months were excluded from the study. Ethical committee approval was obtained from the Institutional Ethics committee. Finally, 4013 students who met the inclusion criteria and gave informed consent were screened for PCOS using the clinical criteria of self-reported irregular periods and/or hirsutism. All those who self-reported irregular periods and/or hirsutism and a randomly selected proportion of the screen negatives were then subjected to clinical examination and ultrasound to apply the Rotterdam criteria by a senior gynaecologist.

Irregular periods was considered as a menstrual cycle length more than 45 days or less than 8 cycles in a year (Carmina E, 2010). Hirsutism was documented by the Ferriman Galwey scale and a score of 8 or more was considered as evidence of hirsutism (Ferrinam D, 1961). Ultrasonography was done transabdominally by a senior radiologist using GE Medical Systems Vivid S5. As all the participants were unmarried, transabdominal ultrasonography was employed. Sonological evidence of polycystic ovaries was considered if even one ovary had a volume of 10 mL or more and/or follicle number 12 or more. TSH, Prolactin and 17 -OH progesterone was done in all these participants to rule out other causes of irregular periods and hirsutism. PCOS was diagnosed by the Rotterdam criteria if any two of the following three criteria were present; irregular periods or amenorrhoea, hirsutism and polycystic ovaries on ultrasonography (in the absence of any other disorder causing the same manifestations (Rotterdam 2004).

Sociodemographic and clinical variables were studied in all the participants. Anthropometric variables like Body Mass Index (BMI), waist circumference and waist hip ratio were also studied for all the participants. Body height was recorded to the nearest 0.5 cm and body weight to the nearest 0.1 kg. BMI was defined as body weight (kilograms) divided by the square of body height (meters). Waist circumference was measured in the horizontal plane at the umbilicus and midway between lowest rib and the iliac crest at the end of a normal expiration. Hip circumference was measured at the level of the greater trochanters. Waist circumference and hip circumference were measured to the nearest 0.1 cm. The reproducibility was assessed. Blood pressure was measured in the seated position in the right arm after a 30-minute rest period. The average of two measurements taken

5 min apart was the reported blood pressure.

The data collected was entered in Microsoft Excel and analysed using SPSS version 25. Baseline characteristics of the study patients were summarised in terms of frequencies for categorical variables and mean (± SD) for continuous variables. Chi-square test was used for understanding associations and significance level for categorical variables and t- test for continuous variables. A minimal statistical significance was fixed as p≤ 0.05

RESULTS

This cross-sectional survey of 4013 nursing students in Trivandrum District was done to self-screen for PCOS. 591 study subjects who self-reported irregular periods and/or hirsutism and a randomly selected number of the screen negatives were then subjected to clinical examination and ultrasonography to apply the Rotterdam criteria. Three study subjects with abnormal thyroid function tests and hyperprolactinaemia and two who had inconclusive ultrasonography were excluded from the present study. Among the remaining 586 study subjects who were screen positive, 529 were diagnosed to have PCOS after applying the Rotterdam criteria and considered as the study group. 399 subjects who did not have PCOS were considered as the comparison group.

Sociodemo graphic characteristics of participants

Among the 529 study subjects with PCOS, 62.9% belonged to the age group 18-20 years and 37.1% belonged to the 21-24 years age group. In the PCOS group, 29.7% came from an urban background and 70.3% came from a rural background. The age of menarche in the PCOS group was found to be 9 or earlier in 0.4%, 10-12 years in 31.2%, 13-15 years in 66.9% and after 15 years in 1.5%.

Clinical and sonological characteristics (Table1)

Among the PCOS group, 74.7% had irregular periods and 57.1% had hirsutism whereas in non PCOS group only 8% had irregular periods and 2.3% had hirsutism and the difference was found to be statistically significant. Both irregular periods and hirsutism was detected in 31.8%of PCOS group. Clinical hyperandrogenism in the form of acne was found in 37.1% in PCOS group and 25.8% in non-PCOS group, alopecia and frontal balding in 2.5% of PCOS and 0.5% of non PCOS group. Acanthosis nigricans was detected in 51% of the PCOS group, but only in 7.5% of non PCOS. All these were found to be statistically significant. Of those who had acanthosis nigricans in the study group, 75% were found to be overweight or obese. In this study there were 147 study subjects with PCOS who had hypertension (≥130/85 mm Hg) giving a prevalence of 27.8%, but there was no statistically significant difference with the non-PCOS group.

The maximum study subjects with PCOS belonged to phenotype D (42.9%).

Table 1 Clinical And Sonological Characteristics Of PCOS

Clinical and ultrasonographic characteristics	PCOS N=529 n (%)	Non -PCOS N=399 n (%)	P value
Irregular periods	395 (74.7%)	32 (8%)	<0.001
Hirsutism (FG score 8 or more)	302 (57.1%)	9 (2.3%)	<0.001
Irregular periods and hirsutism	168 (31.8%)	0 (0.0%)	<0.001
Acne	196 (37.1%)	103(25.8%)	<0.001
Alopecia	13 (2.5%)	2 (0.5%)	0.03
Acanthosis	271 (51%)	30 (7.5%)	<0.001
Polycystic ovaries on ultrasound	523 (98.9%)	82 (20.6%)	<0.001
Hypertension ≥ 130/85mmHg	147 (27.8%)	127(31.8%)	0.191

Polycystic ovaries was diagnosed on ultrasonography if ovarian volume was 10 mL or more and/or follicle number 12 or more in any one ovary. In the PCOS group 98.9% had polycystic ovaries on ultrasonography, compared to 20.6% in the group without PCOS, which was also statistically significant.

Anthropometric characteristics (table 2)

Table 2 shows that in the PCOS group, 15.1% subjects were overweight and 15.7% were obese constituting overall 30.8%, compared to 19.8% in those without PCOS which was found to be statistically significant (p value 0.002). Another interesting finding was that 27.8% of PCOS were underweight. A normal Body Mass Index (BMI) was seen in 41.4% of PCOS.

Waist circumference more than 80 cm was found to be 16.1% in PCOS group compared to 7.3% in those without PCOS, and this was statistically significant (p value ≤0.001). A waist hip ratio >0.8 is also considered as a risk factor for metabolic problems. In this study the prevalence of an increased waist hip ratio is 67.5% in PCOS group when compared to 59.1% in non PCOS group which is also statistically significant (p value 0.011).

Table 2 Association Of Anthropometric Variables And PCOS

BMI(South Asian criteria)	PCOS N=529 No. (%)	Non-PCOS N=399 No. (%)	P value
Underweight (<18.5)	147 (27.8%)	134 (33.6%)	0.002
Normal (18.5-22.9)	219 (41.4%)	186 (46.6%)	
Overweight (23.0-24.9)	80 (15.1%)	39 (9.8%)	
Obese (25.00)	83 (15.7%)	40 (10.0%)	
Waist circumference80 cm	85 (16.1%)	29 (7.3%)	<0.001
Waist hip ratio>0.8	357 (67.5%)	236 (59.1%)	0.011

DISCUSSION

PCOS among young adults is a growing problem of public health importance. The reason why girls above 18 were enrolled in this study is that the transitory symptoms and signs of adolescence would have disappeared and hence premature labelling of girls as having PCOS could be avoided.

Prevalence estimates vary significantly globally due to differences in ethnicity. Community based studies in Asia have ranged from 6.3% in Sri Lanka to 7.5% in China (Kumarapeli V, 2008; Li R, 2013). There are limited studies in India. Prevalence of 9.13% by Nidhi R et al (2011) and 22.85% by Joshi B et al (2014) have been reported in young women with PCOS in India. In this study we have a prevalence of 13.1%. The mean age of the study group was 20.11±1.576and the mean age of menarche was 12.97 ±1.206. In the study by Ramanand SJ et al (2013) with a similar study population, the mean age was 22.05 ± 4.649 and the mean age of menarche was 13.71 ± 1.398.

PCOS is associated with considerable heterogeneity in clinical symptoms and endocrine features. In the present study, oligomenorrhoea was present in 74.7% and hirsutism in 57.1% and both features were present in 31.8 % of PCOS. Majumdar A and Singh TA (2009) also have reported that 76.4% had menstrual irregularities, 66.4% had hirsutism and 38.8% had both. In the study by Ramanand SJ. et al (2013), 12.5 % patients self-reported abnormal hair growth and in their clinical examination 44.16% women had hirsutism. Acne was 37.1% in PCOs compared to 25.8% in the group without PCOS in this study. Alopecia and baldness were much less common in this study (2.5%). Ramanand SJ et al (2013) reported acne to be 20% and alopecia to be 6.6%. Acanthosis nigricans is a surrogate marker of insulin resistance. In the present study 51.2% patients showed acanthosis of whom 75% were either overweight or obese. Ramanand SJ et al (2013) reported 52.2% obese women with acanthosis vs 20 % non- obese women.

In the PCOS group, 98.9% had polycystic ovaries on ultrasonography, compared to 20.6% in those without PCOS, which is comparable to other studies (Clayton RN, 1992).

Obesity is a risk factor which increases the consequences of PCOS by increasing the risk for metabolic dysfunction. In this study, the number of obese and overweight women in the study group was 15.7% and 15.1% respectively. In the study by Joshi et al (2013), 7.5 % cases were overweight and 20.7% were obese. The mean BMI in this study was 21.4±4.0 which was similar to other Indian studies (Joshi B 2014). However, in the study by Ramanand SJ et al (2013), the mean BMI was much higher 27.32 ± 6 and the proportion of overweight and obese women were about 75%. The mean waist circumference in this study was 69.89.5 which was slightly less than other studies. In this study, BMI, waist circumference and waist hip ratio all had statistically significant higher mean values compared with the non PCOS group. This was also seen in other studies as well. In the study by Majumdar A et al (2009), overweight and obesity were found in 66.6% and lean PCOS in 3.6% only, but this was a heterogenous age group. In this study lean PCOS were found to be 27.8%. Some other studies have shown different values and this is probably because of the different cut offs used in this study. In the study conducted by Kalra A et al (2006), the percentage of obese, over weight and normal BMI in Indian PCOS women based on ACOG criteria was 15.38%, 44.6% and 40%

respectively. It has been reported that the predisposition of Asian Indians to insulin resistance and cardiovascular risk factors are high at even low BMI. Hence young PCOS should be advised to maintain a normal BMI. Nair MKC et al in their study (2012), also support screening for menstrual irregularity, obesity and signs of clinical hyperandrogenism for early diagnosis of PCOS.

CONCLUSION

This study demonstrates that PCOS is a clinically heterogenous condition with an increased prevalence of irregular periods, hirsutism, acne and acanthosis. Overweight and obesity are significantly increased in the syndrome and these warrant long term follow up for metabolic diseases. A younger age group of late adolescents or young adults with these clinical characteristics is ideal to screen for and detect polycystic ovary syndrome in order to institute lifestyle intervention to prevent metabolic problems.

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