Prevalence of poly cystic ovarian syndrome among students of a tertiary care teaching hospital

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Abstract

Purpose of Study: India already has highest number of patients with type 2 diabetes mellitus globally and rapid rise of the incidence of obesity in children is the prime reason for increasing insulin resistance, the metabolic syndrome, dyslipidemia and polycystic ovarian syndrome. Prevalence of this syndrome in our community remains unknown.

Objective: The study was done to determine the prevalence of PCOS among students in Tamil Nadu, India due to sparsity of PCOS prevalence data in the state. We attempted to find its prevalence in students, aged between 17-23 years in a tertiary care teaching hospital.

Materials and Methods: A cross sectional study with sample size 246 was done. Students of aged 17-23 years were randomly selected from various batches of medical and paramedical courses. Presence of hyper androgenic features and menstrual irregularities were assessed and they were physically examined to validate the self-assessed mFG scoring. The diagnosis of PCOS was made on the basis of Rotterdam's criteria.

Results: Seventy nine students (32.11%) met the criteria to be diagnosed as polycystic ovarian syndrome. Thirteen students (5.2%) had a history of thyroid dysfunction. The other clinical features of hyperandrogenism among those who had PCOS were like oily skin (13.82%), acne (8.53%), increased hair growth (5.69%), male pattern thinning of hair (9.75%), high degree of intolerance to cold and heat (3.25%) and galactorrhoea (0%).

Conclusion: PCOS can be thought of as a precursor syndrome that, if screened for, can help in early identification of risk of highly morbid conditions, in adolescent girls and women in their early twenties.

Keywords: PCOS, Adolescent, Risk factors.

Introduction

Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders in women. The prevalence of polycystic ovarian syndrome ranges from 2.2% to 26% among the endocrine disorders.[1-6] There are many interacting factors which result in clinical and/or biochemical hyperandrogenism. The symptoms of PCOS emerge slowly and these features are coincident with the changes of normal pubertal development. So these subtle features may not be recognised in an early stages and may account for the failure to identify the disorder in young girls. Women with PCOS are at an increased risk of obstructive sleep apnea, infertility, dysfunctional uterine bleeding, metabolic syndrome, type 2 diabetes, cardiovascular disease, depression and certain cancers.[7-14] So polycystic ovarian syndrome patients should invite early diagnosis and interventions. Preventing measures like exercises, healthy diet, practicing meditation, calming exercise that reduce stress levels etc. play an important role in reducing the complications of PCOS. Gestational Diabetes Mellitus (GDM) poses serious health risks to both the mother and the fetus. So diagnosing PCOS at an early stage in life can help prevent these complications of maternal and child health which appears to cover two of the eight objectives of Millennium Development Goals (MDG).[13] The first step towards early and accurate diagnosis is to determine the percentage of prevalence of the disease in different types (age and ethnicity) of populations. India is the diabetic capital of the world and it has highest number of patients with type 2 diabetes mellitus. There is a rapid rise in the incidence of obesity in children which results in metabolic syndrome, dyslipidemia, insulin resistance and polycystic ovarian syndrome. The prevalence in Asian countries appears to be lower, with a reported prevalence of 2.4% in China[1] and 6.3% in Sri Lanka[23] (Rotterdam criteria). Prevalence was found to be 6.8% in north Indian women.[11]

Tamil Nadu, a southern state of India is being placed at fourth among the states having maximum percentage of obese adults.[14] In view of the above cited causes and the fact that prevalence of this syndrome in our community remains unknown, we attempted to find its prevalence in medical, dental, nursing and paramedical female students, aged between 17-23 years, in a teaching hospital of Tamil Nadu, India.

Materials and Methods

A cross sectional study was done in a tertiary care teaching hospital of south India. The Institutional Ethics Committee approval was obtained prior to the study.

Based on the expected prevalence of 20% and confidence level 95%, the sample size for this project was calculated to be 246. Students of aged 17-23 years were randomly selected from various batches and branches of medical and paramedical courses. Although they were students of one college in a particular area, they represented a larger geographical area because they were from urban, semi-urban and rural areas around the district. The study subjects were then distributed questionnaires which included queries pertaining to the presence of hyper androgenic features and menstrual irregularities (amenorrhoea/ oligomenorrhoea). All the subjects were physically examined to validate the self-assessed mFG scoring given by the subject. The diagnosis of PCOS was made on the basis of Rotterdam's criteria. The Rotterdam guidelines (2003) tell that the patient should have two of three criteria: oligo-or chronic anovulation, clinical and/or biochemical signs of hyperandrogenism, polycystic ovaries. Exclusion of other etiologies of androgen excess and anovulatory infertility is necessary. The Rotterdam's criteria is based on the principles like modified Ferriman Gallwey scoring, ultrasound criteria and evaluation of anovulation. The Ferriman Gallwey score of 8 or greater defines the population of women with hirsuitism.[15] The ultrasound criteria defines the polycystic ovary as containing 12 or more follicles measuring 2–9 mm and/or an increased ovarian volume of > 10 cm^3.[16] Menstrual disturbances in PCOS generally present in the form of oligo-amenorrhea (fewer than eight episodes of menstrual bleeding per year or menses that occur at intervals greater than 35 days).[17] The female students aged between 17-23 years studying medical or paramedical

course in the college and who were willing to go for an ultrasound examination were included in the study. Informed consent was obtained both in the questionnaire and at the time of the ultrasound.

Results

Seventy nine students (32.11%) met the criteria to be diagnosed as polycystic ovarian syndrome. The demographic profile and the average age of onset of menstruation among the students are depicted in table 1. The percentage of students who met the Rotterdam's criteria is shown in table 2. Total number of students previously diagnosed with PCOS was 10.16%. Two students were previously diagnosed with PCOS but now they did not satisfy Rotterdam criteria as the ultrasound criteria are not fulfilled (absence of cysts in ovaries that satisfy criteria). Thirteen students (5.2%) had a history of thyroid dysfunction. Number of students, among those who have thyroid (as denominator); who also have now been diagnosed with PCOS was 61.5%. The other clinical features of hyperandrogenism among those who had PCOS were like oily skin (13.82%), acne (8.53%), increased hair growth (5.69%), male pattern thinning of hair (9.75%), high degree of intolerance to cold and heat (3.25%) and galactorrhoea (0%). The other hyperandrogenic features were not considered in the diagnosis of PCOS as there is no standardized method (like Ferriman Gallwey method for hirsutism) that uses these features to satisfy the Rotterdam criteria of clinical hyperandrogenism. None of the students gave a self or family history of late onset congenital adrenal hyperplasia or galactorrhoea.

Table 1: Demographic profile of PCOS students

Demographic profile and mFG score	With PCOS	Without PCOS
Age	18.91± 1.69	19.12 ± 2.04
BMI	23.49 ± 3.89	22.28 ± 3.12
mFG score	8.51 ± 0.58	4.53± 0.28
Average age of onset of menstruation	12.71± 0.60	13.23± 0.68

Data are expressed as Mean± SD

Table 2: Percentage of students who met the Rotterdam's criteria

Clinical Features	Proportion of students
Irregular periods	28.86%
Cyst or increased stroma in ovaries	34.14%
Hirsutism (mFG)	24.79%
Both menstrual irregularity and cyst in ovaries	23.57%
Both cyst in ovaries and hirsutism	15.04%
Both menstrual irregularity and hirsutism	9.75%
Menstrual irregularity, cyst in ovaries and hirsutism	8.5%

Data are expressed in percentage

Discussion

The average age of students with and without PCOS did not show much difference. Therefore there

appears to be no difference in the incidence of PCOS in the various age groups between 17-23 years. The average BMI of those with PCOS is slightly higher (1.21) than those without it. The average mFG scoring

shows an average of 3.98 score increase in those with PCOS compared to those without. Among the three Rotterdam criteria the most common one is presence of follicles or increased stroma in the ovaries indicating that this is a common occurrence. The percent of students having only menstrual irregularity with cyst (15.85%) which is higher than those having only the other two combinations (6.5% and 1.2%) showing that a student with menstrual irregularity is more likely to have a cyst and vice versa. About 10.16% of the students had already been diagnosed with PCOS but the prevalence found was 32.11% indicating that there is a need for screening and early diagnosis and increased awareness about the condition. About 61.5% of students with thyroid disorders also presented with PCOS and therefore there is a greater than half chance that adolescent girls might have PCOS if they are diagnosed with thyroid dysfunction. Similar reports were observed in a survey on 728 women wherein the prevalence was 8.7% according to NIH criteria and 17.8% according to Rotterdam criteria.[22]

PCOS is one of the most common endocrine disorders among women but the diagnosis, management and the complications have not been standardized. Hyperandrogenism and menstrual irregularity are the most prevalent symptoms of PCOS patients, but these symptoms are not absolute requisite for diagnosis of PCOS. Similarly the ultrasonography evidence of polycystic ovaries as a diagnostic marker doesn't validate much. The percent prevalence of PCOS was 32.11% which is comparable to some other studies done.[2,12,24] The increased prevalence of PCOS among young aged females may be due to unhealthy dietary habit like junk foods, lack of exercises, sedentary life styles. The childhood obesity can lead to insulin resistance and metabolic syndrome in later part of the life. Stress is one of the major factors for all types' diseases now a day.[18] The changed life style disorder can lead to increased stress among the adolescents. So the students should be encouraged to follow stress relieving techniques like yoga, meditations and to modify the lifestyles. Studies done on familial PCOS suggested that subjects with classic features of PCOS, anovulation and hyperandrogenism, may have an affected sister who is equally hyperandrogenemic, but has regular cycles[19,20] and polycystic ovaries.[21]

The mFG score is a subjective one and in this study; the subject, the student undertaking the study and the guide have crosschecked for the grading of hirsutism thus reducing the subjectivity to an extent.

Conclusion

The percent prevalence of PCOS at the college of a tertiary care teaching hospital in Tamil Nadu in students aged 17-23 years has been determined to be 32.11%. Now that the percent prevalence has been determined to be higher compared to the previous studies cited above, and its future complications are associated with severe morbidity (diabetic micro and macro vascular complications; neonatal complications on being born to a GDM subject); the disease should be given more importance by means of early screening and diagnosis. This should be followed up counseling regarding lifestyle modifications. The awareness of the presence of a disease called PCOS among the general public is alarmingly low and it is our duty to educate the masses about the complications associated and need for prevention. However the percentage of subjects diagnosed with PCOS at this stage, who face complications in the future should be assessed first to see if a diagnosis at this age could have predictive value in assessing the risk of complications like infertility; diabetes, metabolic syndrome etc. in the future.

This study can thus be followed up by a cohort study wherein we could monitor these students in the long run to observe and find out how many of them do develop complications in the future. Thus it can be determined whether a diagnosis of PCOS at 17-23 years can actually predict the occurrence of complications and if so, to what extent.

Once this is determined; if the prediction value is high; this PCOS diagnostic criteria can be used to implement PCOS screening for every adolescent over the age of 18. This would then bring down the incidence of morbidity associated with the disease.

Acknowledgments

Conflict of Interest: None.

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