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Prevalence and Undetected Burden of Polycystic Ovarian Syndrome (PCOS) Among Female Medical Undergraduate Students in South India - A Prospective Study in Pondicherry

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ABSTRACT

Title: Prevalence And Undetected Burden Of Polycystic Ovarian Syndrome (PCOS) Among Female Medical Undergraduate Students In South India - A Prospective Study In Pondicherry

Subtitle: PCOS among Medical Undergraduate Students

AIM: To estimate the prevalence of PCOS among medical undergraduate young women in a teaching hospital in Pondicherry and to estimate the load of undiagnosed PCOS in the same group.

MATERIALS AND METHODS: A prospective, study was done among female medical undergraduate students of Sri Lakshmynarayana Institute of Medical Sciences Pondicherry (SLIMS). The participants were given a questionnaire covering information, including demography, detailed menstrual history, hirsutism, galactorrhoea and other medical illnesses followed by interview, physical examination and ultrasound (USG) when indicated. Diagnosis of PCOS was confirmed using Rotterdam's criteria.

RESULTS- The PCOS prevalence was 11.76%. Oligomenorrhoea alone or in combination with hirsutism were the most common presentations in those with PCOS. Among the PCOS cases 16 (52.14%) were newly identified.

CONCLUSIONS :PCOS prevalence among medical students in our study was high, with more than half the disease load hidden.

KEYWORDS : Polycystic Ovarian Syndrome, Prevalence, Medical students

INTRODUCTION:

Polycystic ovary syndrome (PCOS) is one of the commonest endocrinopathies in women, affecting 5–10% of women in the reproductive age worldwide. PCOS is a genetically complex endocrine disorder of women of uncertain etiology and is a common cause of anovulatory infertility, menstrual dysfunction, and hirsutism [1]. Although menstrual abnormalities are the commonest symptom in adolescent gynecological practice, these clues to diagnosis are largely overlooked by a sensitive teenager ,as it is often masked by adolescent dysfunctional uterine bleeding which is expected to settle over course of two years

Literature search revealed a paucity of data on exact prevalence in south India. The nuances in the diagnosis of a spectrum wide heterogeneous phenotype of PCOS, with many different propositions in the set of diagnostic criteria in practice, and unaffordable cost of evaluation in developing countries, pose a challenge to accurate assessment of its prevalence.These considerations prompted us to do the study and estimate the undetected magnitude of the problem. We embarked on this study among a group of educated privileged young women who had at least had a basic medical training in human biology, who had every access to resources like human expertise and medical facility for diagnosis and management of PCOS.

MATERIALS AND METHODS:

After obtaining ethical clearance from institutional ethical committee, this prospective study was done among all currently studying female medical undergraduate students at Sri Lakshmynarayana Institute of Medical Sciences, Pondicherry (SLIMS) who were in clinical years 1, 2, 3 MBBS &CRRI (compulsory residential rotatory interns) i.e. those who had completed their training of Ist MBBS (that includes basic sciences, anatomy, physiology & biochemistry) and who gave informed consent. The study was done during the period March to December 2012.

All the participants were given a self-administered questionnaire covering information including demography, menstrual history, hirsutism, galactorrhoea and other medical illnesses.

The following four problems were specifically looked for

1. Oligomenorrhoea [Absence of menstruation for ≥35 days at least four times a year] or Amenorrhea [No menstruation continuously for 6 months]
2. Hirsutism measured by modified Ferriman–Gallwey (FG) score ≥8 (Ferriman and Gallwey, 1961). Scoring was done by studying terminal hair in nine body areas (upper lip, chin, chest, upper and lower abdomen, upper arms, thighs and upper and lower back) using a grading scale from 0 to 4, and the scores in each area were summed. Terminal hair was defined as pigmented, coarse and longer than 5 mm. Those who had undergone shaving/laser therapy were requested to recall the density of growth.
3. Galactorrhoea
4. Obesity or Overweight [BMI >30, BMI [25-29'9]

Those participants with either of the four or any combinations thereof were further followed up with more detailed examination. This comprised of in-depth history and clinical examination including anthropometry and physical examination aimed at finding out more regarding the existing symptoms and probing for other related symptoms in order to exclude related disorders like Thyroid dysfunction, Cushing's syndrome.

A confirmed case of PCOS was defined according to the Rotterdam diagnostic criteria as having two of the following: oligo/amenorrhea, clinical and/or biochemical hyperandrogenism, and polycystic ovaries. Clinical hyperandrogenism was defined as modified Ferriman and Galway (FG) score of 8 or higher, with or without acne and/or androgenic alopecia. Biochemical hyperandrogenism was considered present with a serum testosterone level 2 standard deviations above the mean of normal women of reproductive age in the absence of other causes of hyperandrogenism [3]. Polycystic ovaries on ultrasound scanning was defined as an ovarian volume greater than 10 cm^3 and/or 10 or more 2 to 8 mm follicles in a single plane when ultrasonography was performed .A count of the highest number of follicles measuring 2–9 mm in diameter seen in single plane from each ovary was recorded. Ovarian volume was calculated using the simplified formula for a prolate ellipsoid (0.5 x length x width x transverse diameter). Ovaries, which contained cysts greater than 10 mm in diameter, were excluded from the calculations as per diagnostic recommendation. The data was compiled and assessed for prevalence of PCOS and any specific patterns in disease presentation.

RESULTS

There were 259 girls in the sampling frame of which 238 gave their informed consent. We thus had a participation rate of 92 %. Their age ranged from 19 to 25 yrs with a mean of 20.57 yrs., BMI was in 17-34

range. A total of 41 subjects with oligomenorrhoea and/or hirsutism, with or without obesity or overweight were taken up for further evaluation of which 28 were diagnosed as PCOS subjects by Rotterdam' s criteria and 13 failed to meet Rotterdam criteria and hence were ruled out for PCOS. Therefore 11.76% (28/238) was found to be the prevalence in this study group. Of these 57.14% (16/28) were newly detected cases and 42.86% (12/28) of these were already known PCOS cases. Of these 7/12 (58 %) had received some irregular treatment in the last one year, only 1 out of the 7 had normal periods after treatment at the time of the study .All others discontinued treatment and were symptomatic.

All PCOS subjects had history of persistent menstrual irregularity even after two years of attaining menarche. 27 (96.42%) of those with PCOS had oligo / amenorrhoea. One (3.57%) of the PCOS cases had galactorrhea. 17 (60.71%) of the cases had hirsutism and 7 (25%) were either overweight or obese. The commonest combination was of hirsutism with oligomenorrhoea found in 9 (32.14%) of the cases. Interestingly there was one PCOS case that was underweight. [Table1, 2]

DISCUSSION

Menstrual dysfunction is the commonest gynecological complaint (75-80%) among adolescents, yet is often overlooked [2]. PCOS has been mostly associated with menstrual irregularity as shown in many studies; Study by Nair et al reported the rate of detection of PCOS among those with menstrual dysfunction was as high as 72.6%. [2] and estimated prevalence of actual menstrual dysfunction in population in Thiruvanandapuram India to be 13.56% (95% CI 12.42-14.71) and prevalence of PCOS as 9.8% in total population at Thiruvananthapuram India [2]

Nidhi R, et al (2011) found that prevalence of PCOS in Indian adolescents to be 9.13% in Andhra Pradesh, South India. [3] The prevalence of PCOS in the Chinese community population was 5.6% (894/15 924) [4]. The community prevalence of PCOS studied by random selection using Rotterdam criteria depicts the observed rates to be 6.3% in Sri Lanka, 2% in south China and 5% in Thailand in young women in their 20s, while it is 8% in UK, and around 4% in the USA, the latter showing no difference between white and black women. A more recent retrospective birth cohort (i.e., a mixture of ethnic groups) from Australia using Rotterdam criteria reports a higher prevalence of 11%.[5] Teede Deeks et al in 2010 found prevalence of PCOS to be 18% based on Rotterdam diagnostic criteria, 70% of these women were undiagnosed.[6]

Our study in south India, Pondicherry has also given a similar prevalence rate. The most common problems found among the PCOS cases in our study were oligo or amenorrhea. Obesity and/or overweight were relatively not that common. In addition, the presence of menstrual irregularities was universal among the case right from the time of their menarche. It is of importance to note that the clinical characteristics and biochemical features of these patients may vary according to race and ethnicity the age and the population studied.

We have used the Rotterdam criteria for diagnosis of the PCOS cases. The rate of case detection is also influenced by the diagnostic criteria chosen in each study (Rotterdam, NIH, AES), the age group involved, the type of ultrasound criteria, whether transabdominal or transvaginal modality, device employed, endocrinological evaluation and observer bias. Ferdous et al in 2011, studied participants of similar ethnic origin attending the pre-marriage clinic. The prevalence of PCOS was 7% based on NIH criteria, 15.2% based on Rotterdam criteria, i.e. more than twice the prevalence obtained based on NIH criteria and 7.92 % by AES criteria. .Prevalence of PCOS is reported to be somewhat higher by using trans-vaginal USG as transvaginal USG evaluation seems to yield better visualization than transabdominal imaging [7].

Although the disease manifests even as an adolescent, the diagnosis of this condition has remained largely elusive. The physiological pubertal menstrual irregularity in the first two years following menarche may shield the recognition of the disease early in adolescence. It is a sensitive issue for adolescence to relate their problems, bringing it to the notice of the family members or the healthcare provider. Detection and treatment is delayed or unaddressed until problems of infertility emerge .Even though obesity, hirsutism, irregular menstrual cycles and acne could be of concern to the adolescent affecting the self image, the fear of being diagnosed of a serious illness or the portending infertility issues and the concern of marital incompetencies defer their visit to the doctor for evaluation. PCOS being less comprehended, even on consulting a primary care health provider, often a false assurance that all will be fine overtime appeals and appeases much to the dreaming of the affected individuals .The costs involved in the diagnosis of this condition by ultrasound and / or hormonal assay may not be universally feasible to all in developing nations. The lack of awareness of health related issues and poor health seeking behavior contribute to the masquerade of PCOS. The need for aggressive and early diagnosis of this condition cannot be more emphasized. By early appropriate intervention, the long-term morbidity could be minimized and the quality of life could be improved largely.

As in our study, luke warm attitude in health seeking behavior is substantial even among the educated medical undergraduates who are formally exposed to the knowledge of menstrual physiology and also when access to medical help is at stone throw distance .

CONCLUSION:

The prevalence of PCOS among young adult medical undergraduates girls was 12.18%. Although they had easy access to medical facility and basic knowledge about female biology, more than half of the cases remained undetected. Among the 12/28 already diagnosed PCOS subjects only one subject had her menstrual cycles regularized. the rest 11/12 discontinued therapy and were symptomatic.

This points to the need for concentrated efforts to enhance awareness as well to encourage reporting of symptoms among young adult women even at the very early stages of menstrual irregularities. Further, a greater focus on the physicians' part not to miss these early signs is also mandated. Health education and screening for PCOS needs to take shape and gain momentum. A simple menstrual history assessment of the target groups at primary care level could detect possible PCOS as early as adolescence to facilitate early appropriate intervention.

Table 1: Body Mass Index (BMI) of PCOS subjects

BMI	<19-Under wt	19-25	25-29'9- Overwt	>30-Obese
n/ (%)	1(3.57%)	20 (71.43%)	5(17.86%)	2 (7.14%)

Table: 2 Phenotype of PCOS Cases

Total no 28	O	H	O+H	O+ BMI>30	O+H+ BMI25-29.9	O+H+ BMI<19	O+H+Ga
n	9	1	9	2	5	1	1
%	32.14	3.57	32.14	7.14	17.86	3.57	3.57

O-oligomenorrhoea, H -hirsutism, BMI-Body Mass Index, Ga-galactorrhoea

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