

## Original Article

## PREVALENCE OF POLYCYSTIC OVARIAN DISEASE (PCOD) AMONG FEMALE MEDICAL STUDENTS

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**Objective:** To estimate the prevalence of PCOD among female medical students.

**Material & Methods:** A cross sectional study of 1st and 2nd year medical college students was undertaken to estimate the prevalence of PCOD. Data was collected through a self-administered questionnaire based on the clinical tool developed by Pedersen Sue et al. Obesity, longer and/or abnormal menstrual cycles, hair on upper lip, chin, breast, chest, back, belly, arms, and thighs, dark hair and acne were associated with the diagnosis of PCOD. Data was analyzed using SPSS and descriptive statistics were calculated. Chi-square or Fisher exact test were used to determine statistical significance at  $\alpha=0.05$ .

**Results:** A total of 391 students from 1st (75%) and 2nd (25%) year participated in the survey. The majority of the students were aged between 18-20 years (96%), originated from Punjab (79.1%), had less than 50,000 Rupees per month family income (57%) and lived in the hostel (60%). Although the majority reported having normal menses (79.7%) with an average length of 25-34 days (56.7%), a significant minority reported one of the diagnostic criteria of PCOD especially fewer than 8 menstrual cycles per year (18.5%), acne (40%) and a coarse body hair pattern (41.8%). This pattern included coarse hair on the upper lip (20.8%), chin (13.1%), breast (10.5%), chest (6.7%), back (2.3%), belly (13.8%), arms (10.5%) and thighs (11.8%). A noteworthy portion also reported other signs and symptoms including being rated as overweight (25.4%), experiencing milky discharge from nipples (5.4%), suffering from anxiety or depression (67.9%) and thinning scalp hair (54.9%). Historical indicators included a positive personal history of ovarian cysts (7.4%) and a family history of diabetes (39%) and ovarian cysts (12.1%).

**Conclusion:** According to the clinical diagnostic criteria, 7.7% of female medical students in the sample population have PCOD validating the claim that PCOD is a common and under diagnosed endocrinopathy and highlighting the need for increased awareness, knowledge and appropriate treatment.

**Keywords:** PCOD, Polycystic ovarian disease, Infertility and reproductive health.

### Introduction

Women's reproductive health is an important and integral part of the medical landscape today. Among the numerous health issues plaguing women today is the disorder known as Polycystic Ovarian Disorder. Many experts contend that PCOD is the most common female endocrine disorder, affecting approximately 5-10% of women of reproductive age (12-45 years old) and is thought to be one of the leading causes of female infertility.<sup>2</sup>

PCOD is a hyperandrogenic disorder associated with chronic oligo-anovulation and polycystic ovarian morphology. Altered androgen production and various metabolic derangements lead to a spectrum of clinical manifestations which include obesity, anovulation, amenorrhea, acne, hirsutism, male pattern baldness, infertility and psychological impairments including depression and other mood disorders.<sup>3</sup> The symptoms and severity of the

syndrome vary greatly among women.

The diagnosis of PCOD is based upon the above symptomatology as well as confirmatory tests. As history and clinical examination provide a sound basis for presumptive diagnosis, research utilizing these is feasible and cost effective. Tests routinely done for the diagnosis of PCOD are weight, body mass index (BMI) and abdominal circumference. Laboratory tests include: hormonal assays (estrogen, FSH, LH, testosterone), fasting glucose, glucose tolerance, lipid and prolactin levels. Morphology of the ovaries is documented through vaginal ultrasound or pelvic laparoscopy<sup>4</sup>.

A 2008 study by The Androgen Excess and PCOS Society reviewed all of the available data and interviewed experts in the field. They recommended a single outline to be used consistently and PCOS to be defined by the presence of hyperandrogenism (clinical and/or biochemical), ovarian dysfunction

(oligoanovulation and/or polycystic ovaries) and the exclusion of related disorders.<sup>11</sup> Various diagnostic criteria that exist for PCOD include the National Institutes of Health, Rotterdam and Androgen Excess Society criteria. The Rotterdam and AES prevalence estimates are up to twice as high as those with NIH criteria thereby demonstrating discrepancies.<sup>9</sup> The 1990 NIH criteria was taken as the standard guideline for diagnosis, however the 2003 Rotterdam consensus workshop revised this criteria to emphasize that PCOS is a syndrome with no single diagnostic criteria. Its cardinal features include hyperandrogenism & polycystic ovarian morphology and other clinical manifestations include menstrual irregularities, signs of androgen excess, obesity, insulin resistance and elevated serum LH levels.<sup>17</sup>

PCOD is a significant disease burden which has been established in the literature, however there is an inadequate knowledge base among clinicians, medical students and young females overall, underlined by the insufficient recent research globally as well as in Pakistan. The baseline study for PCOS prevalence in 1988 clearly demonstrated that even in women who considered themselves normal and did not consult gynecologists, up to 23% had polycystic ovaries showcasing the insidious nature of this syndrome.<sup>22</sup>

Subsequent studies have elaborated prevalence rates globally. A 2000 prospective study in unselected Caucasian women in Spain reported a prevalence rate of 6.5%.<sup>21</sup> A 2003 study of college students in Seoul documented a prevalence of 4.9%<sup>16</sup> while a 2005 community based screening study in Sri Lanka utilized an interviewer administered questionnaire based on the Rotterdam criteria in order to discover a total prevalence of 6.3%.<sup>15</sup> More recently in 2009, high school students were studied in Rasht, Iran using multistage cluster sampling based on NIH criteria which lead to PCOD diagnosis in 11.43%.<sup>6</sup> A prospective cross-sectional 2010 study of Mexican women reported overall prevalence of 6.0% and 12.8% reported in Mexican-American women.<sup>10</sup> The most recent study in 2011 in Iran established a 7.1% prevalence using a randomly selected stratified, multistage probability cluster sampling.<sup>5</sup>

One of the only relevant and luckily recent studies done in Pakistan was done to determine the frequency in obese diabetic and non-diabetic females with clinical features of hyperandrogenism. The results demonstrated that the frequency of PCOS was slightly higher in diabetics than non, 70% versus 61% respectively. Statistical analysis of these

results demonstrated that there was no significant difference between the frequencies and therefore this study negated a very popular view that type 2 diabetes could be a risk factor of PCOS. However, it is unclear whether this study will hold up in international research or has even been acknowledged thus far.<sup>12</sup> This lack of data and understanding of PCOD in Pakistan clearly dictates the need for further allocation of funds, attention and research avenues to this area.

## Material & Methods

A cross sectional study was conducted at Fatima Jinnah Medical College for Women Lahore. The study population was based on 1st year and 2nd year female medical college students. A convenient sampling technique was used in which all students who were present in class were included in the study. It was conducted after a class test of 1st year and an anatomy stage of 2nd year students in order to maximize the study population.

Data was collected using a self administered structured questionnaire based on the clinical tool developed by Pederson Sue et al.<sup>24</sup> A presumptive diagnosis of PCOD was based on a positive history of the following signs and symptoms: excessive facial and hair growth (hirsutism), irregular menstrual cycles, obesity, acne, male pattern baldness, skin tags, skin discoloration and personal or family history of ovarian cysts. The questionnaire sought information on demographic characteristics such as age, sex, personal and family history and socioeconomic status and specific symptoms related to PCOD such as menstrual cycles, hair growth patterns, family history, etc.

Previous permission to carry out the study was obtained from the respective heads of the departments in which the study took place. Informed consent was taken from individual students before the questionnaire was administered. Participation was entirely voluntary and anonymous.

The variables employed in this study were qualitative categorical variables which included: presence of hirsutism, presence of irregular menstrual cycles, presence of obesity, presence of acne, presence of male pattern baldness, presence of skin tags, presence of skin discoloration and presence of personal or family history of ovarian cysts. Data was analyzed using Statistical Package for the Social Sciences (SPSS) software and descriptive statistics were calculated. Frequency distributions were employed to analyze the above categorical variables. Chi-square or Fischer exact test were used to determine statistical

## Results

The study population consisted of 391 students of 1st and 2nd year medical students from Fatima Jinnah Medical College who were analyzed to determine the prevalence of PCOD among female medical students. Data consisting of demographic details and information regarding the symptomatology of PCOD among student was considered.

With respect to the demographic characteristics of the sample population, the majority of the students studying in Fatima Jinnah Medical College came from the province of Punjab (78.8%) followed by Kashmir (7.3%), while the least number of students came from Balochistan and FATA (4.9%). **(Table 1)** The literacy level of most parents was equivalent to the BA/Bsc level (25%). The majority of mothers were qualified up to matriculation or BA/Bsc while the majority of fathers were educated to the MA/Msc and professional (doctors and engineers) level. None of the parents were uneducated. **(Table 1)**

As regards to occupational status, the vast majority of student's mothers were housewives (70%), while most of the fathers were doing government jobs (45%), followed by business (24%). **(Table 1)**

The majority lived in homes owned by their families (80%), followed by families living in rental houses (12%). Only 8% resided in accommodation provided by the employers and other means (8%). **(Table 1)**

Most student's families in the study population had an estimated average monthly income of 15,000 to 39,999 (37%) while the fewest number of parents earned around 150,000 to 199,999 (2.7%). **(Table 1)** The results pertaining to PCOD are as follows: **(Table 2)**

- a The majority (56.7%) had an average menstrual cycle length of 25-34 days while the remaining had less than 25 days (22.6%), 35-60 days (5.6%) and variable length (9.7%).
- a The vast majority categorized their menstrual cycles as normal (79.7%).
- a A significant minority reported 8 or fewer menstrual cycles per year (18.5%).
- a A coarse body hair pattern was reported by 41.8% including coarse hair on the upper lip (20.8%), chin (13.1%), breast (10.5%), chest (6.7%), back (2.3%), belly (13.8%), arms (10.5%) and thighs (11.8%).
- a 9.7% reported dark hair on some part of their body and 30.5% skin darkening in some area.

- a A noteworthy 54.9% complained of thinning scalp hair 5.4% reported experiencing a milky discharge from nipples at some point 40% suffered from acne.

**Table-1:** Selected sociodemographic characteristics of the study population

Background Characteristic	Percentage
<b>Province of Origin</b>	
Punjab	78.8
Sindh	2.1
AJK	7.3
Khyber Pakhtoon Khawaa	3.6
Balochistan	1.3
Fata	0.8
Other	6.2
<b>Literacy Level of Father</b>	
Below Metric	4.1
Metric	7.9
FA/FSc	15.9
BA/BSc	25.1
MA/MSc	17.7
Doctor/Engineer	16.7
Other postgraduation	11.3
Uneducated	0.3
<b>Literacy level of Mother</b>	
Below Metric	18.2
Metric	20.8
FA/FSc	16.2
BA/BSc	22.3
MA/MSc	15.6
Doctor/Engineer	3.6
Other postradauation	2.3
Uneducated	0.1
<b>Father's Occupation</b>	
Government Job	44.9
Private Job	16.4
Business	23.3
Other	13.8

<b>Mother's Occupation</b>	
Housewife	73.3
Government Job	21.3
Private Job	3.6
Business	0.5
Other	1.0
<b>Type of Residence</b>	
Own	79.7
Rental	11.5
Employer Provided	6.4
Other	2.1

25.4% categorized themselves as overweight or obese at some point after puberty. Most experienced some form of anxiety (67.9%), 30.5% suffered from depression, 39% had a positive family history of Diabetes Mellitus, 12.1% had a positive family history of ovarian cysts, 7.4% had a positive personal history of ovarian cysts. Therefore, according to the outlined diagnostic criteria, 7.7% of female medical students in the sample population had PCOD. (Table 3)

### Discussion

PCOD has been examined all over the world including studies discussing prevalence in young females, its association with other comorbid conditions, diagnostic criteria and treatment. Unfortunately, very little about this pertinent topic has been explored in Pakistan.

The aim of the study was to assess prevalence of PCOD in female medical students (1st and 2nd yr) according to the diagnostic criteria of regularity and length of menstrual cycles, obesity, acne, hirsutism, nipple discharge, personal or family history and psychological impairments. The results exhibit that although the majority of students report normal menstrual cycles, a significant minority reported one of the other diagnostic criteria of PCOD especially irregular or abnormal menstrual cycles, acne and coarse hair. The study also validated the claim that PCOD is a common endocrinopathy as 7.7% of the study population can be diagnosed according to the criteria.

The study also took into account the demographic distribution of the students and literacy level of

**Table-2:** Significant characteristics of PCOD among study participants.

Background Characteristic	Percentage
<b>Average menstrual cycle length</b>	
<25 Days	22.6
25 - 34 Days	56.7
35 - 60 Days	5.6
> 60 Days	1.3
Totally Variable	9.7
<b>Eight or fewer menstrual cycles per year</b>	18.5
<b>Category of menstrual cycle normal</b>	79.7
<b>Categorized as overweight</b>	25.4
<b>Coarse hair pattern on:</b>	
Upper Lip	20.8
Chin	13.1
Breasts	10.5
Belly	13.1
Arms	10.5
Thighs	11.8
Chest	6.7
Back	2.3
Dark Hair on some areas of the body	9.7
Dark skin on some areas of the body	30.5
Thin scalp hair	54.9
Suffer from acne	40.0
Skin tags	7.4
Milky discharge from nipples	5.4
Experience anxiety	67.9
Family history of diabetes mellitus	39.0
Family history of ovarian cysts	12.1
Previous history of ovarian cysts	7.4

**Table3:** Diagnosis of PCOD among study participants.

Diagnosis of PCOD	Percentage
Positive	7.7
Negative	92.3

students' parents. This clearly showed that majority of students originate from Punjab which is expected and logical due to FJMC's location in Punjab. These results demonstrated that most mothers of students are housewives who are less educated than the fathers and the estimated average monthly familial income falls within 15,000 to 40,000 Rupee range. This is in accordance with the social distribution of Pakistan's overall population; however it may be a factor in the seeming lack of knowledge regarding PCOD and should be probed further.

The study design had the potential to suffer from a low response rate due to lack of awareness so in order to counteract this, a relatively basic questionnaire was designed. The study design also suffered selection bias as only 1<sup>st</sup> and 2<sup>nd</sup> year medical students were included in study population. This bias was mostly due to time and logistical constraints. In further studies, this could be eliminated through expansion of the study population.

The limitations of the study included a short time

frame, very specific study population and lack of awareness about the subject. However it was a concerted effort as no proper established work has been done on this topic in Pakistan. Clearly further investigation should be carried out in order to comprehend the scope as well as future disease progression of PCOD.

### Conclusion

The prevalence of PCOD among female medical college students using the outlined diagnostic criteria is 7.7% which is in accordance with the previously documented and accepted prevalence of 5 to 10%. This further highlights the need for early and appropriate treatment in order to avoid or limit the long term ramifications of PCOD as well as increased awareness and knowledge of PCOD itself as it is a pervasive aspect of women's reproductive health.

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