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Prevalence of PCOS with Associated Symptoms and Complications at Tertiary Care Hospital of Karachi

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Authors' contributions

This work was carried out in collaboration among all the authors. Author UZ designed the study, wrote the protocol along with the first draft of the manuscript and did the sampling and statistical analysis. Authors ZM and KM managed the literature searches and final drafting. Author JAH provided the clinical facilities. Author DZ did all the paper work and helped in statistical analysis. All the authors read and approved the final manuscript.

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ABSTRACT

Aim: The aim of this study is to determine the prevalence of PCOS among different gynecological disorders at tertiary care hospital of Karachi and to assess the most frequent presenting complaint with associated complications among them.
Study Design: Single-centered cross-sectional study.
Place and Duration of Study: Gynecological clinic of Karachi at a Tertiary care Hospital during 3rd December 2018 to 29th March 2019.
Methodology: Total 335 premenopausal women approached the clinic with different gynecological disorders during the period of four months and 305 patients agreed to participate. The patients were enrolled via convenient sampling technique. After taking the informed consent they were evaluated through clinical interviews, questionnaire, and anthropometric measurements. The

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diagnosis of PCOS was made by using Rotterdam criteria 2003. Menstrual irregularities were assessed via history. Clinical hyperandrogenism was evaluated by using modified Ferriman–Gallwey scale and Acne Global Grading System. Obesity was calculated through BMI. The Hamilton scale was used to appraise associated psychological disturbances.

Results: PCOS was the most prevalent gynecological disorder (55.41%) among women of the premenopausal age. Overall, the most frequent presenting complaint was infertility but age related variations in symptoms showed that young adolescent and adulthood had more menstruation irregularities while, in late adolescent the chief complaint was infertility. Moreover, these patients were either overweight 32% or obese 46.2%. Other associated problems such as anxiety and migraine were more frequent in young adults and juveniles respectively.

Conclusion: PCOS is the most common gynecological problem in our region. These women usually presents with altered complains that influence their physiological and psychological health which in turn effects the quality of life.

Keywords: Polycystic ovary syndrome (PCOS); prevalence; associated symptoms and complications.

1. INTRODUCTION

Polycystic ovary syndrome (PCOS) is a frequently occurring gynecological disorder, characterized by chronic anovulation, hyperandrogenism and numerous small fluid-filled follicles like cysts in one or both ovaries among women of the childbearing age. It occurs mainly due to the imbalance of endocrine hormones in premenopausal women [1].

PCOS has a variable prevalence of 4%–21% around the globe, might be owing to different diagnostic criteria or because of diverse environmental and genetic factors [2]. Currently, Rotterdam Criteria ESHRE/ASRM 2003 is preferred for diagnosing PCOS over NIH 1990 criteria and AE-PCOS 2006 criteria [3]. Accordingly, the diagnosis of PCOS is established only if any two of the following features are present in the female of reproductive age which includes anovulation/oligo-anovulation, hyperandrogenism or appearance of polycystic ovaries on ultrasonography.

In these patients normal physiological functions of the body are disrupted that become evident by acne, hirsutism, altered BMI and sleep disturbances [4]. Women with PCOS have been observed to have hyperinsulinemia and metabolic syndrome too [5]. Data from different studies revealed that there is significant non-homogeneity amongst PCOS symptoms [6]. However, most commonly normal menstrual cycle is disturbed that makes it harder to get pregnant. About 70 to 80 percent of the women presented with infertility [7].

Furthermore, multiple researches documented the mental and emotional divergence like depression and anxiety are accompanied in such female that affects the quality of life [8].

Very little is known about the prevalence and frequency of PCOS in Pakistani women attending gynecological clinics along with foremost presenting complain. Moreover, data regarding the PCOS related complication in this region is also scarce.

Therefore, the current study is conducted to investigate the frequency of PCOS amongst gynecological disorders; its relation with BMI and to highlight the age-related variations in its chief presenting complains and associated problems.

2. MATERIALS AND METHODS

This was a single centered cross-sectional study that was conducted on the women who attended the gynecological clinic at Mamji hospital of Karachi from December 2018 to March 2019. The study was approved by the Ethical Review Committee of Ziauddin University.

It was carried out in reproductive age women between 15 to 40 years. The sample size was calculated by open epi sample calculation (95% CL) and the sampling technique was non probability convenient sampling. Total 335 women were recruited out of which the 305 women agreed to participate. After informed consent, they were interviewed on an individual basis and their privacy was highly maintained. They were questioned about the pattern of the menstrual cycle, hirsutism, acne, weight issue, infertility and information about past diagnosis or treatment of PCOS or any other illnesses.

The Rotterdam criterion was used to diagnose PCOS and established by the presence of at

least two of the three following criteria after exclusion of other etiologies, i.e. oligo/amenorrhea or amenorrhea, clinical and/or biochemical hyperandrogenism, and polycystic ovaries on ultrasonography.

The menstrual irregularity was assessed by the presence of chronic amenorrhea/oligo-menorrhea, which is described as menstrual cycle length of less than 21 days or more than 35 days, or more than four days variation between cycles.

Clinical hyperandrogenism was assessed via the modified Ferriman Gallwey (mF-G) scoring method for hirsutism [9] and acne via Global Acne grading system [10].

Ultrasound scan of the abdomen and pelvis was carried out by a single certified postgraduate medical ultrasonologist. Polycystic ovaries were identified on ultrasonography by either 12 or more follicles with a 2–9 mm diameter, or increased ovarian volume (> 10 cm) in at least one of the ovaries.

Moreover, weight and height were measured by standard protocol and calibrated instruments. Body mass index (BMI) was calculated as weight (kg) divided by height squared (m2).

The Hamilton rating scale was used for anxiety and depression [11].

2.1 Statistical Analysis

Statistical analysis was performed in SPSS software for Windows, version 20. The variables were characterized as frequency and percentages.

3. RESULTS

Total 305 women were included who meet the inclusion criteria i.e. premenopausal women (aged between 15-40 years) came with gynecological disorder at Tertiary care hospital of Karachi.

Our result showed that out of 305, 169 women were suffering from PCOS as depicted in Fig. 1 which signifies that PCOS is the topmost gynecological condition (54.41%), occurring in more than half of the studied women. The second foremost was endometriosis with 16.40% followed by uterine fibroid and UTI with the rate of 13.35% and 12.18% respectively. A small number of patients also presented with breast cancer and cervical cancer.

Fig. 2 illustrated the frequency of primary complaint among PCOS patients which revealed the topmost reason for attending the clinic was infertility with 57 of the patients. The second most important reason was menstruation irregularity (46) followed by obesity (33), hirsutism (22) and acne (11).

Our data showed that there is high variation existed among PCOS patients of different age groups as depicted in Fig. 3 which demonstrated that infertility was most distressing among age range 21-25 years and 26-30 years while menstruation irregularity were highest in teen agers and late adolescents (31-40 years).

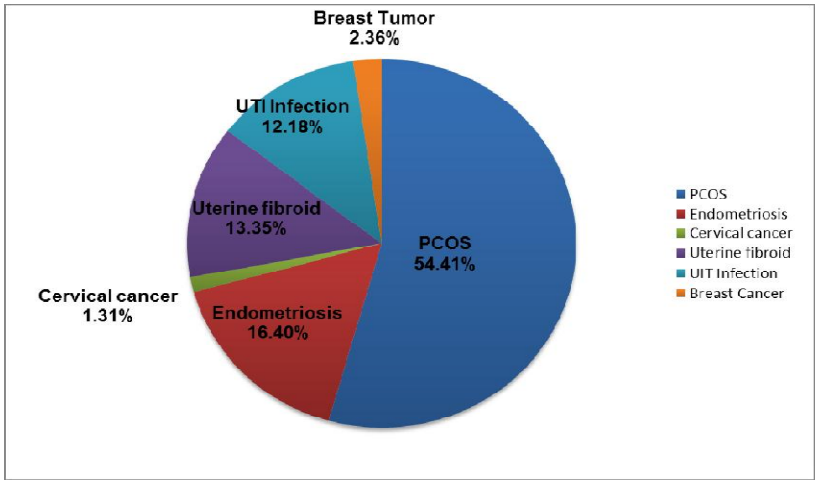

Fig. 1. Prevalence of PCOS among gynecological disorders in patients of reproductive age

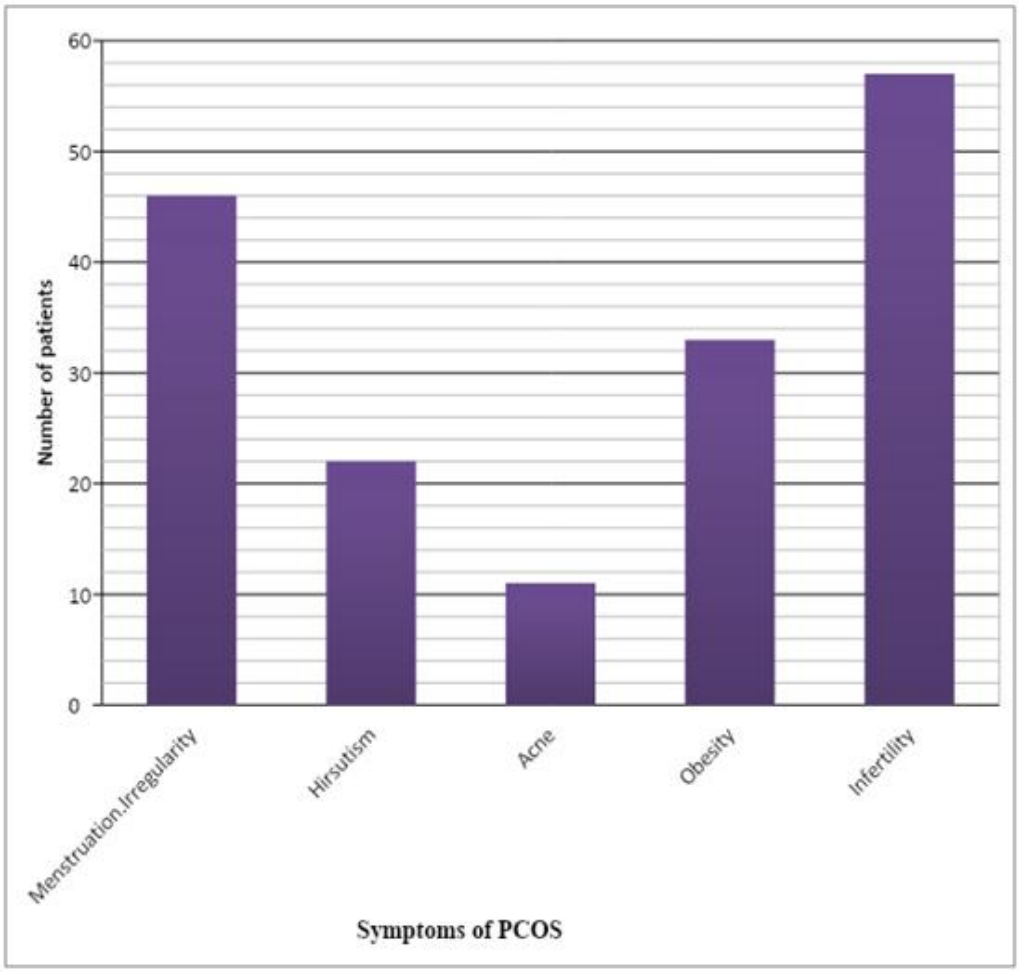

Fig. 2. Frequency of primary presenting complain among PCOS patients

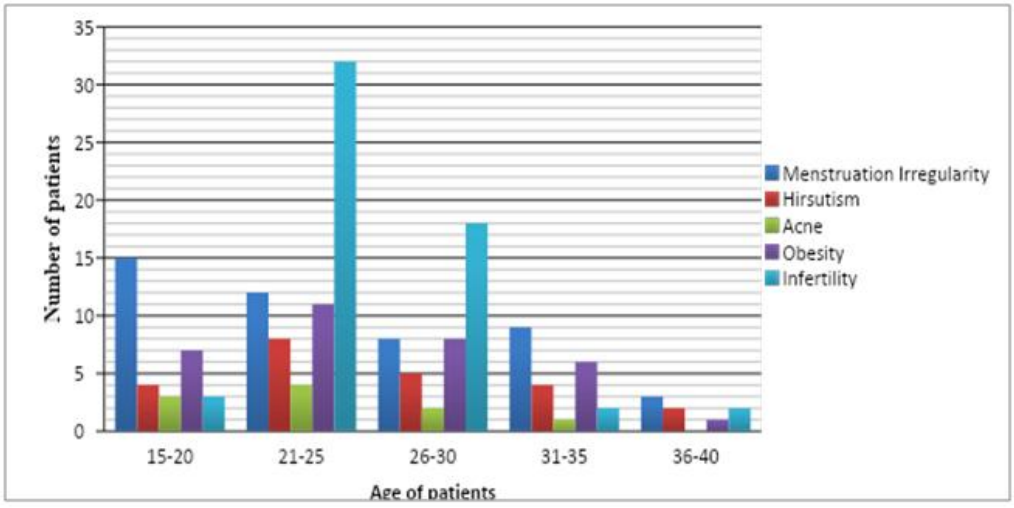

Fig. 3. Age related variation in symptomatology of PCOS patients

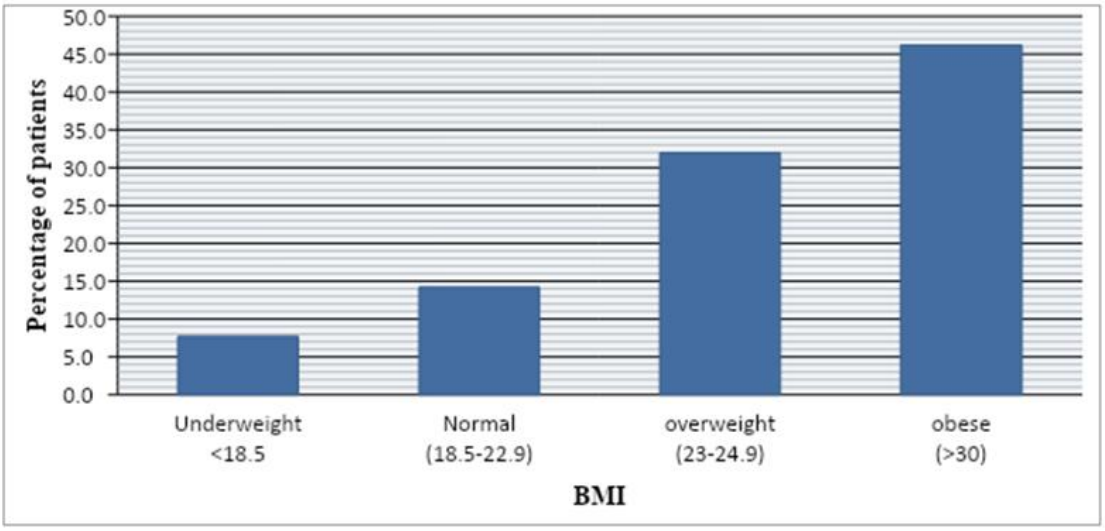

Fig. 4. Pattern of BMI in PCOS patients

Table 1. Age related variation in associated problems amongst PCOS patients

Age	PCOS associated complications						Total
	None	Migraine	Depression	M/D	Irregular pulse/HR	Anxiety	
15-20	19	8	1	1	0	2	31
21-25	5	7	18	7	3	27	67
26-30	0	6	15	1	2	17	41
31-35	2	2	9	4	1	4	22
36-40	1	0	4	0	3	0	8
Total	27	23	47	13	9	50	169

From the data obtained it was revealed that the patients who presented to the gynecological clinic with PCOS were mostly either obese (46.2%) or overweight (32%).

Our data also documented the vast pattern of associated problems amongst PCOS patient in relation to different age group. Migraine was more prevalent in young age group i.e. between 15-20 while depression was more common amongst the age ranges in between 21-25 and 26-30. Pulse irregularity and increase heart rate were also observed with increasing age.

4. DISCUSSION

The Polycystic ovarian syndrome also as known as Stein Leventhal syndrome is the most common endocrinological disorder in women of reproductive age involving various organ due to hormonal imbalance [12]. According to Charalamkis et al. PCOS is the most common endocrine disorder in women of the fertility age and is associated with several components of the metabolic syndrome such as obesity, insulin resistance, hyperlipidemia, hyperpiesia, sleep apnea and menstruation irregularity [13].

The incidence of PCOS is rapidly increasing these days that might be due to changes in lifestyle, dietary pattern and associated hormonal disturbances [14].

To the best our knowledge this is the first study that evaluated the prevalence of PCOS among gynecological disorder in our region of world however huge data is available regarding its prevalence in general population, acne, hirsute and infertile patients [15-18]. In the present study, PCOS stands out with 54.41% comprising of more than half of the patients which is an agreement with a study done by Zandi et al in Iran who documented nearly similar results with 60.2% PCOS cases based on the NIH criteria [15]. However, in a survey-based study on Iranian women the prevalence of PCOS was 14.6% showing inconsistent results when comparing it to our study [19] and this difference

might be due to the fact that they involve common women of reproductive age. Similarly, a study conducted on female working in government institute of Turkey had PCOS, around 19.9% in premenopausal age which is quite a large number [20]. Subsequent to PCOS endometriosis was the second most prevalent gynecological disorder with 16.4% followed by Uterine fibroid and UTI i.e. 13.35% and 12.18% respectively. The very low frequency of cervical and breast cancer may be due to the fact that these are mainly diseases of post-menopausal age [21,22]. In US endometriosis was exhibited as the third major cause of gynecologic hospitalizations after pelvic inflammatory disease and benign ovarian cyst [23].

In this study, the major concern for visiting the clinic was infertility that was present in 33.7% of the females involving 57 women out 169 PCOS which is concordant to the study by George et al who declared that out of 500 infertile women 168 patients presented in clinic with PCOS which is also around 33%.The current result also mentioned the next prevalent but chief complaint was irregular menses present in 27.2%. Similar to this, a study led in Tibian females documented similar data with infertility and menstrual irregularities as two foremost complaints [24]. The reason of similar data is because both aforementioned studies have similar climatic and environmental conditions.

Misso et al. conducted a systemic analysis and concluded that PCOS is not only the major cause of female infertility (90%) but when such patient conceive they were more prone to develop the pregnancy related complications like diabetes and stillbirth etc. [25]. Another study by Joham et al reported that infertility was found to be 72% in women with PCOS which is about 15-times higher than normal females [26].

Our study also revealed that infertility and other spectra of symptoms were age-dependent as evident by Figure 5.which revealed that women age range in between 21-30 years presented with major complaint of infertility while those age range in between 15-20 and 31-40 had irregular menses as their primary concern which is concordant with study done by Singh et al. in 2017 conducted in Maharashtra, India which stated that the chief complaint of the PCOS patients was infertility (89%) of the women ages in between 20-30 years [27]. Furthermore, it has been documented that 40% of adolescent girls represent initially as menstrual irregularities and acne while hirsutism developed gradually with time due to chronic hyperandrogenemia, however, wedded female are usually more concerned about conception [28,29]. Hsu Ming studied alteration in phenotype with age in PCOS female and reported that hyperandrogenism and menstruation problems were the foremost in younger women with PCOS while obesity and metabolic disturbances were chief issues of older women with PCOS [30].

Obesity is the major concern of PCOS patients as it has a strong impact on physiological and psychological well-being. Our study revealed 46.2% and 32% of the PCOS patients were either obese or overweight respectively as shown in Figure 4. In 2007 a study by Haq et al showed quite similar results of women coming to infertility clinic with PCOS which showed that 39.7% of them were overweight while 28.8% were obese [31].

One more study by Imran et al. witnessed the prevalence of PCOS amongst non-obese and obese showing significant outcomes with 35.4% and 64.5% respectively [32]. In the United States, obesity is considered as one of the leading problems distressing almost 80% of PCOS women, however outer the United States it marks merely 50% of women with PCOS [33]. All of the above mentioned studies including our failed to explain the cause and effect relationship between altered BMI and PCOS and needs debate as PCOS patient with higher BMI are more likely to hirsute, highly prone to menstrual disturbance, altered glucose, lipid metabolism, sleep disturbance and poor responders to infertility treatment than normal weight subjects [34].

PCOS patients also suffer from psychological disorders like depression and anxiety as compared to healthy women. Our study proposed that the overall prevalence of anxiety and depression in polycystic ovarian syndrome was 32.54% and 26.63% respectively evaluated via the Hamilton scale showing quite similar results to that of previous studies like a study completed in Mumbai India in 2018 documented that the incidence of anxiety disorder and depression was 38.6% and 25.7%, respectively. Moreover, they did relate these disorders with infertility, alopecia, hirsutism and acne [35]. Another study by Sayyah, reported the prevalence of anxiety disorders and depressive disorders were found to be 35.7% and 18.9%

respectively when were assessed by a psychiatrist [36].

We also demonstrated the frequency of psychiatric problem among different age groups. Anxiety was more common in age ranges between 21-25 and 26-30 years followed by depression whereas in young adolescents, migraine was the frequent one. Finally, depression was more common in women of age ranges in between 35-40 years with irregular pulse and increase heart rate.

Multiple factors are responsible for psychological disturbance firstly androgen and insulin by their own may cause anxiety disorders if increase beyond normal levels [37]. Secondly infertility in married female is definitely associated with psychological strains and social pressure which lead them towards withdrawal and loneliness. Finally obesity, hirsutism and acne often demarcated them as unfeminine and unpleasing personalities that affect their societal image that ultimately lead to depression and seclusion [38].

5. CONCLUSION AND FUTURE RECOMMENDATION

PCOS is highly prevalent in our region of world comprising greater than half of the Gynecological disorders. It is a complex heterogeneous disorder presenting with spectrum of phenotypes like menstruational abnormality, hirsutism and acne. Infertility was the chief concern of wedded female. Raised BMI was distressing nearly two third of the patients. All these above stated issues have depraved impact on physiological and psychological health of women thus quality of life. Multi centered studies are required to second these results and this stressful syndrome should be reported and treated on priority basis. Moreover, underlying root cause of altered BMI must be evaluated for satisfactory achievement of treatment outcomes.

6. LIMITATIONS

It was a single centered study.

The sampling technique was non-probability convenient sampling so chances of selection bias cannot be omitted.

CONSENT

A written and well informed consent was taken from the patients and preserved by the authors.

ETHICAL APPROVAL

Ethical clearance was obtained from Ethics Review Committee of Ziauddin University.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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