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Prevalence of Mental Disorders and its Severity among Patients with Polycystic Ovarian Disease-Observational Cross-Sectional Study

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ABSTRACT:

Background: Polycystic ovarian disease (PCOD) is the most common endocrine disorder in females of reproductive age group. This is usually associated with increased prevalence in psychological disturbances; we undertook this research to study the prevalence & severity of depression and anxiety in patients with PCOD which can be helpful in identifying and thereby treating them in early stages.

Aims & Objectives: To determine the prevalence of psychological disorder and its severity in PCOD patients.

Methods & Materials: A total of 130 patients diagnosed as PCOD according to the Rotterdam criteria were recruited from the Gynecology OPD after informed consent and ethical approval, and were subjected to structured questionnaires. A proforma along with Hamilton Depression Rating Scale (HDRS) and Hamilton Anxiety Rating Scale (HARS) were provided to the patient in their own language for further assessment.

Results: Out of 130 patients, a total of 101 (77%) patients of PCOD had depression on HDRS, of which majority had mild depression, accounting for 52 (40%) patients, followed by moderate depression in 29 (22.3%). Similarly, a total of 86 (66%) patients were found to have anxiety on HARS, of which moderate anxiety was found in 34 (26.1%) patients followed by severe anxiety in 28 (21.5%) patients. Of all the study variables considered, BMI was found to be significantly associated with depression and anxiety.

Conclusion: The results of the study indicate a high prevalence and severity of depression and anxiety in PCOD patients. This condition warrants a multidisciplinary approach towards treatment; involving both a psychiatrist and a gynecologist will be helpful to the patient.

INTRODUCTION

Polycystic ovarian disease (PCOD) is the most frequent endocrine illness in females of reproductive age, with a global prevalence rate of 2.2% to 26.7%; however, the Indian Fertility Society has reported a higher prevalence rate of 3.7%-22.5% (1-5).

PCOD is distinguished by symptoms such as irregular menstrual periods, hyperandrogenism, and polycystic ovaries. Menstruation may be normal for a few years, although clinical signs of PCOD may appear in women with oligomenorrhoea (87%) or a brief period of amenorrhea (26%), followed by prolonged or heavy periods (3,6,7).

Patients may also have hyperandrogenism, elevated triglycerides, low-density lipoprotein [LDL] cholesterol levels, and low high-density lipoprotein [HDL] cholesterol levels, all of which can lead to obesity, hypertension, hyperlipidemia, and cardiovascular disease, acne & hirsutism collectively known as the X syndrome (4). All these factors can have an impact on an individual's social well-being, as demonstrated.

Anxiety and depression have been found to be much more prevalent in PCOD patients (8). This anxiety and sadness has been mostly related to dissatisfaction with their body image, acne on their face, or difficulty to conceive, all of which have a mental influence on them, resulting in raised stress levels and an inability to deal socially owing to a loss of self-confidence (1,3). Physical appearance changes lead to psychological problems and body image concerns in young adolescent females (7-9). Women with PCOD had higher rates of depression and anxiety compared to women in the general population. Approximately 40% of women with PCOD, particularly young girls, suffer depression (4,5).

Thus, understanding the association between PCOD as well as the development and progression of anxiety and depression is critical for appropriately assessing and managing the patient for their benefit. Therefore, the study was designed and carried out to study the prevalence of depression & anxiety in patients of PCOD & to find out the factors responsible for high rates of anxiety and depression in PCOD patients in relation to the general population & possible corrective measures to be taken for prevention and further treatment.

MATERIAL & METHODS

It was a hospital-based cross-sectional observational study that was conducted after getting approval from the institutional human ethics committee in a Rural Medical College & Hospital, Pondicherry, between October 2022 to January 2024. All patients were diagnosed to have PCOD by Rotterdam diagnostic criteria in the age group 18-50 years. Patients with established psychiatric disease undergoing therapy, or women with hirsutism due to clinically documented conditions such as congenital adrenal hyperplasia, Cushing's syndrome, and testosterone-secreting tumors, were excluded. A total of 130 patients were subjected to structured questionnaires for anxiety and depression using the Hamilton Depression Rating Scale (HDRS) and Hamilton Anxiety Rating Scale (HARS). Statistical analysis was done using IBM-SPSS Version 21.0 (IBM-SPSS Science Inc., Chicago, IL) software.

RESULTS

The mean age of the study population is 29.66 years, with the majority of the subjects in the age group of 27-35 years accounting for 42.31%, followed by 18-26 years with 36.92% and then by 36-45 years with 20.77% subjects. No anxiety, mild anxiety, and severe anxiety were found maximum in the age group of 18-26, who also reported maximum patients with no depression & mild depression, whereas moderate depression & severe depression was high in 27-35 years of patients (Table 1).

56 (43.07%) study subjects were graduates & 43 (33.08%) subjects had higher secondary education, with most of the graduates reporting anxiety & depression.

In terms of occupation, 52 (40%) were homemakers, 25 (19.23%) students & 23 professionals (17.69%).

Approximately 51 (39.23%) had a BMI of 25-29.9, followed by 26 (20.0%) subjects with BMI of >30, with the maximum number of subjects without anxiety/depression found with a BMI of 18.5-22.9, and in subjects with moderate anxiety & moderate to severe depression the BMI was >30. Further, 75 (57.69%) subjects had irregular menstrual cycle whereas 55 (42.31%) had regular menstrual cycle.

44 (33.85%) subjects had no anxiety, 34 (26.15%) had moderate anxiety, 28 (21.54%) had severe anxiety, whereas 24 (18.46%) had mild anxiety in our study. 52 (40.0%) subjects had mild depression, 29 (22.31%) subjects each had moderate depression and no depression, whereas 20 (15.38%) subjects had severe depression.

Table 1: Association of HDRS score with various study parameters

STUDY PARAMETER	GROUPS	No depression(n)(%)	Mild depression(n)(%)	Moderate depression(n)(%)	Severe depression(n)(%)	P value
AGE(Yrs)	18-26	11(22.9)	20(41.7)	11(22.9)	6(12.5)	0.147 Not significant
	27-35	9(16.4)	18(32.7)	10(18.2)	18(32.7)	
	36-45	8(29.6)	6(22.2)	3(11.1)	10(37)	
EDUCATIONAL STATUS	PRIMARY	0(0)	1(50)	1(50)	0(0)	0.772 Not significant
	SECONDARY	4(14.8)	11(40.7)	7(25.9)	5(18.5)	
	MIDDLE SCHOOL	1(50)	1(50)	0(0)	0(0)	
	HIGHER SECONDARY	9(20.9)	16(37.2)	8(18.6)	10(23.2)	
	GRADUATE	15(26.8)	23(41.1)	13(23.2)	5(8.9)	
OCCUPATION	STUDENT	8(32)	9(36)	4(16)	4(16)	0.593 Not significant
	HOMEMAKER	8(15.4)	26(50)	12(23.1)	6(11.5)	
	SKILLED	4(30.8)	4(30.8)	4(30.8)	1(7.7)	
	SEMISKILLED	0(0)	2(50)	0(0)	2(50)	
	UNSKILLED	3(23.1)	4(30.8)	4(30.8)	2(15.4)	
	PROFESSIONAL	6(26.1)	7(30.4)	5(21.7)	5(21.7)	
SOCIOECONOMIC STATUS	UPPER	9(25.7)	12(34.3)	8(22.8)	6(17.1)	0.597 Not significant
	UPPER MIDDLE	11(21.1)	24(46.1)	11(21.1)	6(11.5)	
	LOWER MIDDLE	9(27.3)	11(33.3)	6(18.1)	7(21.2)	
	UPPER LOWER	0(0)	5(50)	4(40)	1(10)	
DOMICILE	URBAN	23(27.3)	31(36.9)	19(22.6)	11(13.1)	0.227 Not significant
	RURAL	6(13)	21(45.6)	10(21.7)	9(19.6)	
BMI (Kg/m2)	0-<18.5	4(80)	0(0)	0(0)	1(20)	

STUDY PARAMETER	GROUPS	No depression(n)(%)	Mild depression(n)(%)	Moderate depression(n)(%)	Severe depression(n)(%)	P value
	18.5-22.9	11(45.8)	10(41.7)	0(0)	3(12.5)	0.001 Significant
	23.0-24.9	3(12.5)	12(50)	8(33.3)	1(4)	
	25-29.9	9(17.6)	28(54.9)	10(19.6)	4(7)	
	>30	2(7)	2(7)	11(42.3)	11(42.3)	
MENSTRUAL PATTERN	REGULAR	9(16.4)	22(40)	14(25.4)	10(18.2)	0.543 Not significant
	IRREGULAR	20(26.7)	30(40)	15(20)	10(13.3)	

Table 2: Association of HARS score with various study parameters

STUDY PARAMETER	GROUPS	No anxiety(n)(%)	Mild anxiety(n)(%)	Moderate anxiety(n)(%)	Severe anxiety(n)(%)	P value
AGE(Yrs)	18-26	11(22.9)	20(41.7)	11(22.9)	6(12.5)	0.084 Not significant
	27-35	9(16.4)	18(32.7)	10(18.2)	18(32.7)	
	36-45	11(22.9)	20(41.7)	11(22.9)	6(12.5)	
EDUCATIONAL STATUS	PRIMARY	0(0)	0(0)	1(50)	1(50)	0.178 Not significant
	SECONDARY	5(18.5)	8(29.6)	5(18.5)	9(33.3)	
	MIDDLE SCHOOL	0(0)	1(50)	1(50)	0(0)	
	HIGHER SECONDARY	10(23.2)	14(32.5)	13(30.2)	6(13.9)	
	GRADUATE	13(23.3)	21(37.5)	4(7.1)	18(32.1)	
OCCUPATION	STUDENT	6(24)	8(32)	7(28)	4(16)	0.244 Not significant
	HOMEMAKER	10(19.2)	15(28.8)	12(23.1)	15(28.8)	
	SKILLED	2(15.4)	9(69.2)	0(0)	2(15.4)	
	SEMISKILLED	2(50)	0(0)	1(25)	1(25)	
	UNSKILLED	3(23.1)	3(23.1)	1(7.7)	6(46.1)	
	PROFESSIONAL	5(21.7)	9(39.1)	3(13)	6(26.1)	
	UPPER	6(17.1)	12(34.3)	7(20)	10(28.6)	

STUDY PARAMETER	GROUPS	No anxiety(n)(%)	Mild anxiety(n)(%)	Moderate anxiety(n)(%)	Severe anxiety(n)(%)	P value
SOCIOECONOMIC STATUS	UPPER MIDDLE	9(17.3)	21(40.3)	13(25)	9(17.3)	0.259 Not significant
	LOWER MIDDLE	9(27)	8(24)	4(12)	12(36)	
	UPPER LOWER	4(57)	3(42.8)	0(0)	3(42.8)	
DOMICILE	URBAN	20(23.8)	30(35.7)	16(19)	18(21.4)	0.418 Not significant
	RURAL	8(17.4)	14(30.4)	8(17.4)	16(34.8)	
BMI (Kg/m ²)	0-<18.5	2(40)	2(40)	1(20)	-	0.002 Significant
	18.5-22.9	6(25)	15(62.5)	3(12.5)	-	
	23.0-24.9	7(29.1)	14(58.3)	3(12.5)	-	
	25-29.9	12(23.5)	12(23.5)	11(21.5)	16(31.3)	
	>30	1(3)	1(3)	6(23)	18(69.2)	
MENSTRUAL PATTERN	REGULAR	17(30.9)	10(18)	15(27)	13(23.6)	0.422 Not significant
	IRREGULAR	27(36)	14(18.7)	19(25.4)	15(20)	

Majority of the patients were found to be from 27-35 years, graduates, homemakers, upper middle class, rural, with a BMI of 25-29.9 & irregular cycles.

DISCUSSION

Polycystic ovarian disease (PCOD) is characterized by an oddly large spectrum of clinical symptoms, concerning various systems and organs, exhibiting irregular menstrual cycle along with infertility; hirsutism features of hyperandrogenism; elevated insulin levels, insulin resistance, and weight gain; dyslipidemia in addition to markers of endothelial dysfunction; common acne, androgenic alopecia, alongside hirsutism, all of which may impair the woman's physical, social, and emotional well-being (2,10,11). The prevalence of psychiatric illnesses in women with PCOD is rapidly growing, with anxiety and depression constituting the two most common evidence-based findings (10). In the present study we have studied the relation between anxiety & depression to PCOD and the need for a multidisciplinary approach for treatment.

In the present study, the mean age was recorded to be 29.66 ± 6 years, with the majority of subjects in the age group of 27-35 years. Almeshari WK et al. (2) also found the mean age to be 28 ± 8 years. A slightly younger age group of patients was affected in the study by RD Joshi et al. (1), where the average age of patients was 25.1 years, which was also in agreement with the study results of Saima Batool et al. (12), who found the mean age to be 25 ± 8.6 years; they conducted their study in a tertiary care center similar to the present study. The discrepancy in mean between the present study and the others is contributed by geographical variance, as some studies were conducted at primary health care centers with minimal patient load (1,2) (Table 1 & Table 2).

In terms of education, most of the subjects were graduates, followed by subjects with higher secondary education. Nevertheless, with such high levels of educational status, the prevalence of PCOD did not diminish and can be thought to be caused due to stress in day-to-day life, which has impacted their life and caused a shift in hormonal balance. Almeshari et al. (2) conducted their study in a city tertiary care hospital where there were many graduates, whereas other studies were conducted in a more

rural backdrop. The study by RD Joshi et al. (1) had 39 graduate women, whereas Almeshari WK et al. (2) had 181 bachelor's degree subjects followed by 51 high school education.

Furthermore, around 99 participants with higher secondary and above education were reported to have both anxiety and depression, whereas 31 were in middle school or lower. Furthermore, in terms of education, most of the patients with any sort of anxiety/depression were graduates, and among those with only higher secondary education, there was a high number of patients with mild anxiety, which was considered statistically inconsequential.

We found 52 homemakers, 25 students, 23 professionals, 13 skilled & unskilled labor each, and 4 semiskilled laborers to be suffering from PCOD. Similarly, RD Joshi et al. (1) reported PCOD in 16 professionals, 9 semi-professional roles, 2 in clerical positions, and 6 unskilled workers or housewives, accounting for a total of 70 individuals. These results were also in sync with the results observed by Saima Batool et al. (12), who classified occupation as self-employed, full-time working & housewives, with reports of 27, 69 & 41 respectively. Housewives spend a significant amount of time caring for their households, making it harder for them to care for themselves, lowering physical activity and increasing mental load as part of their management.

Obesity is a highly prevalent clinical sign among PCOD patients, as is hormonal instability. Saima Batool et al. (12) in their study observed a mean BMI of 33.6 ± 7.1 . The assessment of BMI is of utmost importance; we found that the majority of subjects had a BMI >25 kg/m². These values are in acceptance with other studies that considered patient BMI. Higher levels of BMI are associated with increased chances of hormonal imbalances, insulin resistance, and body dysmorphia in patients with PCOD.

A systematic study and meta-analysis demonstrate that women with PCOD are six times more likely to suffer from moderate to severe depression as well as anxiety. A meta-analysis by Cooney et al. (13) found that the prevalence of anxiety was around 41.9% across 9 studies, which was consistent with our findings. They also found that across 18 studies, the average incidence of depression was 36.6%. Among these, 11 studies explicitly reported the presence of moderate or severe symptoms of depression in the PCOD population (5).

This is reflected in a study conducted by Dybczak et al. (10), wherein the prevalence of clinically significant anxiety symptoms was 42% against 8.5% in healthy women, and depression in women with PCOD was 37% against 14.2% in healthy women. Among Indian studies, the prevalence for depression & anxiety was found to be 39% and 25% respectively. The present study showed 44 people with no anxiety, 34 with moderate anxiety, 28 with severe anxiety, and 24 with mild anxiety. In terms of depression, 52 had mild depression, 29 each had moderate depression and no depression, and 20 subjects had severe depression.

Nonetheless, other investigations found a higher prevalence of mild anxiety compared to the current study. RD Joshi et al. found that 53 patients had mild anxiety, 31% had severe to great anxiety, and 19 had moderate anxiety; 38 patients had mild depression, 27 had moderate depression, and 23 had severe depression (1). Almeshari WK et al. (2) reported mild, moderate & severe anxiety in 184, 42 & 14 patients respectively; further, 11 had very severe depression, 75 had mild depression, 48 moderate depression and 19 severe depression. Chaudhari et al. (4) found mild, moderate, and severe anxiety on HARS in 62.90%, 29.60%, and 7.40% of their sample respectively. Jedel et al. (14) compared 30 patients with PCOD to 30 healthy volunteers and found that anxiety increased in patients with PCOD.

On association of the various parameters with the HDRS & HARS scores to determine the incidence of anxiety & depression across women with PCOD, the following outcomes were observed.

We found that the age range of 18-26 had the highest number of patients with no depression or mild depression, but most patients, regardless of anxiety level (no anxiety, mild anxiety, or moderate anxiety), were high in this age group (Table 1 & 2).

According to Almeshari WK et al. (2), 59 patients with anxiety were unmarried and 41 were married, whereas 67 subjects with depression were unmarried and 55 were married. In contrast, the present study found that 39 unmarried patients had anxiety, while 63 were married and had anxiety; similarly, 38 unmarried subjects had anxiety, and 73 were married and had depression. The variation in outcomes can be ascribed to regional differences, as 62 married couples experience infertility as a result of PCOD, which can lead to high levels of anxiety and depression.

On assessment of the connection of BMI against HDRS and HARS scores, no depression was observed with a BMI of 18.5-22.9, but participants with significant anxiety and moderate to severe depression had a BMI of >30 . Subjects with a BMI ranging from 25 to 29.9 experienced no, mild, or severe anxiety, as well as mild depression. The result was statistically significant ($p<0.05$) (Table 1 & 2).

Despite the fact that the pathogenetic cycle is unknown, BMI has statistical significance in relation to anxiety and depression, making it a useful assessment parameter. The findings of the anxiety and depression tests allow us to better diagnose and manage the patient while lowering associated issues and breaking the cycle. Hahn et al. (15) also found increased depression in PCOD patients with higher BMI levels than controls, but Jedel et al. (14) reported no difference in depression between PCOD and BMI-matched controls, though anxiety increased in PCOD.

In our study, there was a selection bias, as only patients requiring medical attention at a tertiary care facility were included. We feel structured clinical interviews would be more useful in determining the level of psychopathology in PCOD patients. A longitudinal follow-up would provide additional information on the complexities of psychopathology and behavior.

Whilst we had a sizable sample size and tested all needed criteria in PCOD patients in a medical context, there was a loss of follow-up in many of them, preventing a comprehensive picture of the evolution of symptoms over time. Future research should be more thorough, multi-centric, and include clinical evaluation.

CONCLUSION

PCOD is a common endocrine condition that has a significant impact on women's socioeconomic status. Even though the disorder is treatable, its lack of a defined etiology makes it challenging to comprehend the illness. The current study found that young, educated, rural, married women aged 18-27 years are the most common PCOD patients, with moderate levels of anxiety and depression. Furthermore, a clear statistical link between anxiety, depression, and BMI was noted. As both PCOD & psychological disorder have their own long-term consequences, early evaluation, diagnosis, and treatment are needed. This will help achieve the psychological well-being of these women.

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