Prevalence and Association of Various Sociodemographic Factors with Anxiety and Depression of Anxiety and Depression in Women with PCOS

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Abstract

Aim: The aim of this study was to determine the prevalence of anxiety and depression in women with PCOS and to find the association of various demographic and socio-economic factors with anxiety and depression.

Methods: This was cross-sectional study conducted at SKMCH, Muzaffarpur, Bihar, India for the period of 1 years and 100 patients were included in the study.

Results: The mean age of all the participants was 25.5 ± 6.4 and the mean body mass index (BMI) was 27.6 ± 5.7. Out of these 100 cases, 62 (62%) were married. Level of education was postgraduate or master's degree in 28 (28%) cases, followed by undergraduate or bachelor's degree in 32 (32%) cases. Housewife was the most common employment status that was observed in 33 (44.6%) participants, followed by students, which comprised 32 (32%) cases. The length of diagnosis of PCOS was more than one year in 54 (54%) cases, and family history of PCOS was present in 24 (24%) cases. The presence of PCOS-related symptoms was assessed, and all 100 (100%) cases reported experiencing one or more of these symptoms. The most common symptom was menstrual cycle abnormalities, which was present in 76 (76%) cases. Weight gain was experienced by 66 (66%) cases and hirsutism by 55 (55%) cases. The presence of depression and anxiety was assessed using HADS. The mean HADS score was 7 ± 3.8 for depression and 8 ± 3.7 for anxiety. Depression was diagnosed in 18 (18%) cases (score $\geq$ 11), whereas another 17 (17%) cases were found to be in the borderline range for depression (score: 8-10). Anxiety was diagnosed in 15 (20.3%) cases (score $\geq$ 11), whereas another 20 (20%) cases were found to be in the borderline range for anxiety (score: 8-10).

Conclusion: Anxiety and depression are common in patients with PCOS. These psychological conditions are associated with various demographic and socio-economic factors such as BMI, level of education, monthly household income, employment status, and pregnancy. It is recommended to involve a multidisciplinary team while managing patients with PCOS to timely identify and treat these psychological conditions in these patients.

Keywords: mental health, prevalence, depression, anxiety, polycystic ovary syndrome

Introduction

Polycystic ovarian syndrome (PCOS), also called Stein-Leventhal syndrome, is an endocrine disorder that primarily affects the female reproductive system. It is a heterogeneous condition that affects approximately one in 10 women in their reproductive age. [1] Hormonal imbalances, such as elevated serum luteinizing hormone (LH) levels, increased levels of androgens as compared to estrogens, and raised insulin resistance are commonly seen in this disorder. The hormonal imbalance results in various clinical manifestations such as oligomenorrhea or amenorrhea, hirsutism, diabetes, obesity, infertility, and acne. [2] The disease is diagnosed using the Rotterdam criteria, according to which at least two of the following parameters must be present: polycystic ovaries on ultrasound, oligo-anovulation, and hyperandrogenism. [3] Once diagnosed, the condition is managed with a combination of lifestyle modifications (healthy diet, exercise), hormonal pills, anti-androgen therapy, metformin, ovulation induction, and, if needed, artificial reproductive techniques. [4] An integral component of the biopsychosocial model of healthcare includes good psychiatric health, and PCOS is no exception to this. The complications of PCOS can have multiple psychological effects on women.

Research has shown that the prevalence of depression in women with PCOS is higher (28-64%) as compared to the general population (8%). [5-7] The same is also true when we compare the prevalence of anxiety in PCOS patients (34-57%) to the general population (8%). [7-9] These mental conditions adversely affect the quality of life of these patients and it is due to these psychosocial manifestations that women with PCOS are at an increased risk of social phobia and suicide attempts. [9] The prevalence of PCOS in the South Asian population including Pakistan is a matter of grave concern. Studies have reported a prevalence as high as 52% in Pakistani population as compared to 20-25% in Western populations. [10]

The aim of this study was to determine the prevalence of anxiety and depression in women with PCOS and to find the association of various demographic and socio-economic factors with anxiety and depression.

Materials and Methods

This was a single-center retrospective study conducted at Department of Community medicine SKMCH, Muzaffarpur, Bihar, India for the period of 1 year and 100 patients were included in the study.

Written informed consent was taken from all the study participants. The participation was on a voluntary basis. Complete anonymity was maintained throughout the research. The cases diagnosed with depression or anxiety or falling in the borderline range were referred for further psychiatric management.

Study Population

All female patients, aged 18 to 40 years and diagnosed with PCOS, who presented to the Department of Gynecology during the study period were eligible to be enrolled in the study. The Rotterdam criteria was adopted for the diagnosis of PCOS.[3] Patients who were already diagnosed with

depression, anxiety, or any similar mental condition were excluded from the study.

Patients fulfilling the inclusion criteria and providing informed consent were enrolled in the study through the non-probability consecutive sampling technique.

Study Procedure

The patients were provided a pre-designed closed-ended questionnaire that included demographic details, socio-economic status, symptomatic history, and history of comorbidities. The outcome variables including the presence and severity of anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS). [11]

Assessments

HADS comprises 14 items scored on a Likert scale ranging from 0 to 3. Seven items correspond to anxiety and depression each. The even number questions relate to depression, and odd number questions relate to anxiety. The scores range from 0 to 21 for both domains. A score of 7 or less was considered normal, 8-10 as borderline, and 11 or above as diagnostic for anxiety or depression. [11]

Statistical Analysis

The data from the questionnaires were analyzed using SPSS Version 26.0 (IBM Corp., Armonk, NY, USA). Normality of the data was assessed using the Shapiro-Wilk test. As the data were normally distributed ($p < 0.05$), means with standard deviations were used for continuous variables. The categorical data were presented as frequencies and percentages. Pearson chi-square test was performed to find any association of depression and anxiety with demographic and socio-economic variables. Fisher's exact test was applied where expected cell count was less than 5 in one or more cells. A p-value of <0.05 was considered statistically significant.

Results

Table 1: Demographic details of study participants

Parameter	Mean ± SD
Age (years)	25.5 ± 6.4
Body mass index (kg/m^2)	27.6 ± 5.7
Parameter	**No. of patients (%)**
Marital status	
Single	38 (38%)
Married	62 (62%)
Level of education	
No formal education	2 (2%)
Primary	4 (4%)
Secondary/matric	13 (13%)
High school/intermediate	21 (21%)
Undergraduate/bachelor's degree	32 (32%)
Postgraduate/master's degree	28 (28%)
Employment	

Part-time	6 (6%)
Full time	14 (14%)
Housewife	45 (45%)
Student	32 (32%)
Unemployed	3 (3%)
Length of PCOS diagnosis	
Less than 1 month ago	12 (12%)
Between 1 and 6 months ago	19 (19%)
Between 6 months and 1 year ago	15 (15%)
More than 1 year ago	54 (54%)
Family history of PCOS and infertility	
PCOS	24 (24%)
Infertility	2 (2%)
Both	12 (12%)
Neither	62 (62%)
Current pregnancy	
Yes	10 (10%)
No	90 (90%)
Have children	
Yes	25 (25%)
No	75 (75%)
PCOS-related symptoms	
Yes	100 (100.0%)
No	0 (0%)
Diabetes mellitus	
Yes	5 (5%)
No	95 (95%)
Hypertension	
Yes	3 (3%)
No	97 (97%)
Other comorbidities (chronic heart disease, liver disease, and renal failure)	
Yes	6 (6%)
No	94 (94%)
Family history of anxiety and depression	
Anxiety	10 (10%)
Depression	7 (7%)
Both	10 (10%)
Neither	73 (73%)

The mean age of all the participants was 25.5 ± 6.4 and the mean body mass index (BMI) was 27.6 ± 5.7. Out of these 100 cases, 62 (62%) were married. Level of education was postgraduate or master's degree in 28 (28%) cases, followed by undergraduate or bachelor's degree in 32 (32%) cases. Housewife was the most common employment status that was observed in 33 (44.6%) participants, followed by students, which comprised 32 (32%) cases. The length of diagnosis of PCOS was more than one year in 54 (54%) cases, and family history of PCOS was present in 24 (24%) cases.

Table 2: PCOS-related symptoms in study participants

Symptom		No. of patients (%)
Menstrual cycle	Regular	24 (24%)
	Irregular	74 (74%)
	Amenorrhea	2 (2%)
	Present	76 (76%)
Menstrual irregularities		
	Absent	24 (24%)
	Present	50 (67.6%)
Weight gain		

	Absent	34 (34%)
	Present	66 (66%)
Hirsutism		
	Absent	45 (45%)
	Present	55 (55%)
Alopecia		
	Absent	48 (48%)
	Present	52 (52%)
Acne		
	Absent	80 (80%)
	Present	20 (20%)
Infertility		
	Absent	80 (80%)
	Present	20 (20%)
Acanthosis nigricans		
	Absent	90 (90%)
	Present	10 (10%)
Sleep apnea		
	Absent	94 (94%)
	Present	6 (6%)

The presence of PCOS-related symptoms was assessed, and all 100 (100%) cases reported experiencing one or more of these symptoms. The most common symptom was menstrual cycle abnormalities, which was present in 76 (76%) cases. Weight gain was experienced by 66 (66%) cases and hirsutism by 55 (55%) cases.

Table 3: Study outcomes in patients with PCOS

Parameter		Mean ± SD
HADS score	Depression	7 ± 3.8
	Anxiety	8 ± 3.7
Parameter		**No. of patients (%)**
Depression		
Present		18 (18%)
Absent		82 (82%)
Severity of depression on HADS		
Normal		66 (66%)
Borderline		17 (17%)
Abnormal		17 (17%)
Anxiety		
Present		20 (20%)
Absent		80 (80%)
Severity of anxiety on HADS		
Normal		56 (56%)
Borderline		24 (24%)
Abnormal		20 (20%)

The presence of depression and anxiety was assessed using HADS. The mean HADS score was 7 ± 3.8 for depression and 8 ± 3.7 for anxiety. Depression was diagnosed in 18 (18%) cases (score ≥ 11), whereas another 17 (17%) cases were found to be in the borderline range for depression (score: 8-10). Anxiety was diagnosed in 15 (20.3%) cases (score ≥ 11), whereas another 20 (20%) cases were found to be in the borderline range for anxiety (score: 8-10).

Discussion

Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder among women of reproductive age, affecting approximately 5%–10% of women in the Western world. [12] The Indian Fertility Society reported a prevalence of 3.7%–22.5% in India. [13] Women with PCOS exhibit a wide range of symptoms such as amenorrhea, oligomenorrhea, hirsutism, subfertility or infertility, anovulation, weight gain or obesity, acne vulgaris, and androgenic alopecia.

The mean age of all the participants was 25.5 ± 6.4 and the mean body mass index (BMI) was 27.6 ± 5.7. Out of these 100 cases, 62 (62%) were married. Level of education was postgraduate or master's degree in 28 (28%) cases, followed by undergraduate or bachelor's degree in 32 (32%) cases. Housewife was the most common employment status that was observed in 33 (44.6%) participants, followed by students, which comprised 32 (32%) cases. The length of diagnosis of PCOS was more than one year in 54 (54%) cases, and family history of PCOS was present in 24 (24%) cases. The presence of PCOS-related symptoms was assessed, and all 100 (100%) cases reported experiencing one or more of these symptoms. The most common symptom was menstrual cycle abnormalities, which was present in 76 (76%) cases. Weight gain was experienced by 66 (66%) cases and hirsutism by 55 (55%) cases. A literature review of 25 studies on PCOS conducted by Bilal et al [14] showed that more than half of the patients with PCOS fall in the age range of 25-34 years. A study from Singapore showed that BMI was significantly higher in PCOS cases as compared to controls ($p < 0.001$). [15] On the contrary, a study on medical students in Pakistan showed that more than 60% of PCOS cases had a normal BMI. [16] However, the link of obesity with PCOS is already established and is believed to be driven by various genetic and metabolic mechanisms. [17] Family history of PCOS was present in 36.5% of the cases. A local study from Hyderabad, Pakistan, showed that a positive family history of PCOS was present in almost 25% of the patients. [18] The authors from the study concluded that a strong family history in first-degree relatives is linked to genetic predisposition.[18] PCOS-related symptoms were reported by all of the study participants. Menstrual irregularities, weight gain, hirsutism, and alopecia were the most common symptoms. This falls in line with another study conducted in Pakistan, which reported the most common complications in PCOS were obesity (80%) and hyperandrogenism (77.7%). [19]

The presence of depression and anxiety was assessed using HADS. The mean HADS score was 7 ± 3.8 for depression and 8 ± 3.7 for anxiety. Depression was diagnosed in 18 (18%) cases (score ≥ 11), whereas another 17 (17%) cases were found to be in the borderline range for depression (score: 8-10). Anxiety was diagnosed in 15 (20.3%) cases (score ≥ 11), whereas another 20 (20%) cases were found to be in the borderline range for anxiety (score: 8-10). The increased incidence of depression and anxiety is believed to be due to a complex interplay of various underlying mechanisms. One widely accepted view is that the symptomatology of PCOS and these conditions overlaps and thus points toward a common association. [20] Additionally, insulin resistance, hyperandrogenism along with its

related symptoms, obesity, infertility, and disturbance in the hypothalamic-pituitary-adrenal axis are some of the plausible reasons involved in the pathogenesis of these psychological conditions in patients with PCOS. [21] Having highlighted the magnitude of the mental health issues faced by PCOS patients, it is imperative to recommend the inclusion of psychiatrists in the multidisciplinary team providing treatment to these patients. Literature is evident in support of interventions for mental health, such as early screening, prompt treatment, and incorporation of various stress management strategies to decrease anxiety, depression, and stress in patients with PCOS. [22]

Conclusion

Anxiety and depression are common in patients with PCOS. These psychological conditions are associated with various demographic and socio-economic factors such as BMI, level of education, monthly household income, employment status, and pregnancy. It is recommended to involve a multidisciplinary team while managing patients with PCOS to timely identify and treat these psychological conditions in these patients.

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