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Prevalence of Anxiety, Depression and Eating Disorders in Women with Polycystic Ovarian Syndrome in North Indian Population of Haryana

Dr Sukhbir Pal Kaur[1], Dr Susmita Sharma[2], Dr Gagan Lata[3], Dr Sunita Manchanda[4]

[1]Assistant Professor, [2]Professor & Head, [3]Assistant Professor,
Dept of Obstetrics and Gynaecology, Adesh Medical College & Hospital, Mohri, Shahbad, Haryana.
[4]Consultant (Adolescent Paediatrics), Jain Sant Phool Chand ji Charitable Hospital, Sector 4, Gurugram, Haryana.

Corresponding Author: Dr Susmita Sharma

ABSTRACT

Introduction- Polycystic Ovarian syndrome (PCOS) is a non-communicable disease of growing concern due to its effects on physical and mental health of women and long-term consequences associated with it. Majority of adolescent girls and women with PCOS are concerned about its effects on physical appearance like acne, hirsutism, central obesity which can create a negative body image and low self-esteem can lead to anxiety, depression and eating disorders. Insulin resistance and chronic illnesses associated with PCOS can also contribute to mental health issues.

Material and methods-The aim of the study was to find the prevalence of anxiety, depression and eating disorders in women with PCOS. It was a cross sectional case-control study conducted in tertiary care hospital of North India and its attached clinics with 73 women in PCOS group and 78 women in control group. Participants were assessed for presence or absence of PCOS and assigned group accordingly. A pre-structured proforma was filled according to the responses and data was assessed. Anxiety was assessed by GAD 7 scale, depression by PHQ 9 and eating disorder risk by EAT 26 questionnaires.

Results-Women with PCOS had statistically significant increased prevalence of anxiety and depression as compared to controls. PCOS group had more women with higher BMI (>25), moderate to severe anxiety, and moderate to severe depression and the difference was statistically significant. There was no significant difference in eating disorder risk between both groups

Conclusion-Women with PCOS are at higher risk of moderate to severe anxiety and depression.

Keywords- Polycystic ovarian syndrome, anxiety, depression, eating disorders.

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a disease of growing concern among women of reproductive age group. Globally, PCOS affects 6-21% of women of reproductive age group. [1] In India, the prevalence is reported ranging from 3.7% to 22.5% in literature. [2] Symptoms of PCOS encompass menstrual irregularities, features of hyperandrogenism, obesity, fertility problems and psychological issues. [3] Diagnosis of PCOS is increasing among adolescents and young women partly due to awareness of symptoms, willingness to seek medical help and also due to growing changes in environment and lifestyle. Majority of adolescents with PCOS and young women are concerned about the effects of PCOS on physical appearance like acne, hirsutism, central obesity which can create a negative body image and low esteem among these patients. In women with infertility with PCOS, stress levels seem to be higher due to added effects of negative body image due to PCOS along with psychosocial effects associated with infertility. Women with PCOS with metabolic syndrome can have more anxiety and depression due to associated chronic illnesses. It is a known fact that, chronic stress and negative body image can lead to anxiety and depression and eating disorders. PCOS puts tremendous burden on not only physical but also mental health of women

due to its direct effects on health, effects on physical appearance, fertility and also due to other chronic illnesses associated with it. Early recognition of these mental health issues can help with early referral to appropriate mental health specialists and add to wellbeing of these women. With this background, present study was designed to assess the prevalence of anxiety, depression and eating disorders in women with PCOS in comparison to women with no PCOS.

MATERIALS AND METHODS

A cross sectional case-control study was conducted at a tertiary care hospital in North India and its attached clinics in rural and urban health centres over a period of 6 months. Our study was designed to investigate prevalence of anxiety, depression and eating disorders among women with PCOS as compared to control population. A total of 73 women with PCOS were included in the study with 78 women in the control group. Inclusion criteria were women from 14 to 49 years of age with PCOS. Control group consisted of women from the similar group without PCOS. Exclusion criteria were women with pregnancy and women with known mental health problems from before menarche. Clinical details of participants were taken for diagnosis of PCOS and to exclude any pre-menarche pre-existing mental health illnesses. Detailed history and examination of participants included age, marital status, description of menstrual cycle length, presence or absence of acne, hirsutism, measurements of weight, height, waist circumference and hip circumference. Where PCOS was suspected a detailed history to exclude other causes was taken. Women diagnosed with PCOS were included in PCOS group and rest were included in control group. Diagnosis of PCOS was made according to NIH consensus Rotterdam criteria. [3] After clinical and radiological evaluation, subjects were assessed using validated scales for screening of anxiety, depression and eating disorders. For anxiety GAD scale (GAD-7) [4] and for depression PHQ-9 [5] questionnaire was used. EAT-26 questionnaire was used for screening of eating disorder risk in women. [6] PHQ 9 is a self-administered questionnaire based on DSM IV criteria with sensitivity of 73% and specificity of 98%. A score of 5-9 is for mild depression, 10 to 14 for moderate, 15-19 for moderately severe and 20-27 for severe depression. GAD 7 questionnaire consists of 7 questions for anxiety. Score of 5 is cut off for mild anxiety, 10for moderate anxiety and 15 is cut off point severe anxiety. A GAD score of 10 has sensitivity of 89% and specificity of 82% for generalised anxiety disorder. EAT 26 is a screening test for assessing eating disorder risk and consists of 26 questions. A score of 20 or higher indicates concerns regarding body weight, shape and eating. Women who were diagnosed with anxiety and depression or significant eating disorders were referred to specialist for counselling and management. The statistical analysis was done for the data for comparison between PCOS group and control group. Descriptive statistics were used for continuous and categorical data and results were expressed as mean, standard deviation and percentages. Student's t-test and Chi square test were used for comparison value of less than .05 was taken as significant.

This study was carried out with approval of institutional ethical committee. An informed consent was taken for participation.

RESULTS

A total of 151 women were included in the final analysis of study among which 73 women were in PCOS group and 78 women were in control group. Initially, 80 women with PCOS were screened for anxiety, depression and eating disorders. Two cases were excluded due to previous history of eating disorder and anxiety from pre-menarche period. 5 participants were excluded as they were not willing for any further evaluation or participation in the study. Thus, final evaluation was done on 73 women with PCOS and 78 from similar

population without PCOS. The mean age (years) in PCOD group was 24.99 (SD±6.17) and in control group was 25.12 (SD±6.58). The sociodemographic, anthropometric clinical and radiological details of the study population are given in Table 1.

Table 1: Socio demographic, anthropometric, clinical and radiological details of population

Variables assessed	Women with PCOS (N=73)	Women without PCOS (N=78)	*P* value
Age (years)*	24.99 (6.175)	25.12 (6.584)	
Marital status			
Married	41	38	
Fertile	27 /41 (65.85%)	33/38 (86.84%)	.02(S)
Sub fertile	14/41 (34.15%)	5/38 (13.16%)	
Unmarried	32	40	
Education level			
Less than high school	10	11	.94(NS)
High school and above	63	67	
Anthropometric characteristics			
BMI			
Underweight (<18.5)	2	3	
Normal (18.5-24.9)	26	41	.02(S)
Total Overweight (>25)	45/73 (61.64%)	34/78 (43.59%)	
Pre-Obese (25-29.9)	35	29	
Obese class I (30-34.9)	9	5	
Obese class II (>35)	1	0	
Waist circumference (mean -cms)	86	71	
Hip circumference (mean in cms)	99	93	
Waist/Hip ratio	0.86	0.76	
Menstrual cycle abnormalities (N/%)			
Normal	24	55	<.05(S)
Oligomenorrhoea	42/73 (57.53%)	15/78 (19.23%)	
Secondary amenorrhoea	4/73(7.48%)	1/78 (1.28%)	
Irregular cycles	3/73(4.11%)	7/78 (8.97%)	
Lifestyle			
Sedentary	48/73 (65.75)	22/78 (28.2%)	<.05(S)
Clinical and radiological studies (N/%)			
Hirsutism	60/73 (82.19%)	25/78 (32.05%)	<.05(S)
Acne	21/73 (28.76%)	11/78 (14.1%)	<.05(S)
Acanthosis nigricans	6/73 (8.2%)	2/78 (2.6%)	.12 (NS)
Polycystic ovarian morphology (USG)	46(63.01%)	7/78 (8.97%)	<.05 (S)

*mean (SD)

Both the groups were comparable in terms of mean age and educational level. In PCOS group subfertility was more common than control group. Percentage of overweight women (BMI>25) was more in PCOS group 61.64% as compared to control group 43.59% and the difference was statistically significant. The mean Waist/hip ratio of women with PCOS was higher (0.86) and that of control group (0.76). More Women in PCOS group had sedentary lifestyle than control group. Hirsutism was more prevalent in PCOS group and most common site was face, upper lip and chin.

Table 2: Total no of Anxiety, depression and eating disorder cases in study population

	Anxiety (Total cases with anxiety)	Depression (Total cases with depression)	Co-existent anxiety and depression	Eating disorder
PCOS group(N=73)	41/73 (56.16%)	25/73 (34.24%)	22/73 (30.14%)	23/73 (31.51%)
Control Group(N=78)	25/78 (32.08%)	13/78 (16.66%)	10/78 (12.82%)	25/78 (32.05%)
P value	.003(S)	.013(S)	.009 (S)	.94 (NS)

Both anxiety and depression were seen more in PCOS group than control group. Co- existent anxiety and depression were seen in 30.14% of women with PCOS as compared to 13.69% in control group and the difference was statistically significant (Table 2*)*.31.51% women with PCOS had concerns regarding body weight, shape and eating which was comparable to control group (32.05%) and were statistically non-significant. In PCOS group, mild anxiety was found in 26.03%, moderate in 17.8% and severe anxiety was found in 12.32% of women (Table 3). Depressive illness was found in 34.25% of women with PCOS and 16.67% in control group. Mild depression was found in 16.44%, moderate to moderately severe depression in 13.7%, and severe depression in 4.11% of women with PCOS (see Table 4).

Table 3: Distribution of participants according to the levels of anxiety

Anxiety Scoring	No anxiety	Mild anxiety	Moderate to severe Anxiety
PCOS (N=73/%)	32/73 (43.84%)	19/73 (17.8%)	22/73 (30.13)
Control population	53/78 (67.95%)	16/78 (20.51%)	9/78 (11.53%)
P value	.003 (S)	.422 (NS)	.005 (S)

Table 4: The distribution of participants according to levels of depression

Depression Level	No depression	Mild depression	Moderate to severe depression
PCOS group (N=73/%)	48/73 (65.75%)	12/73 (16.44%)	13/73 (17.81%)
Control (N=78/%)	65/78 (83.33%)	9/78 (11.54%)	4/78 (5.13%)
P value	.01 (S)	.38 (NS)	.01 (S)

While differences between two groups in terms of mild anxiety or mild depression were not statistically significant, moderate to severe anxiety was higher in PCOS group (30.13% vs 11.54%)as compared to control group (Table 3). Moderate to severe depression was also significantly higher in PCOS group 17.8% than in control group 5.13% (Table 4).

DISCUSSION

Ovarian syndrome is a common condition with reproductive and other health implications. Women are diagnosed as having PCOS when two of three criteria are fulfilled which include polycystic ovarian morphology, features of hyperandrogenism, and oligo- anovulation (Rotterdam's criteria). [3] It is associated with fertility problems, obesity, metabolic syndrome, development of type 2 diabetes and psychological issues. Hence, it has potential to cause a significant reduction in health-related quality of life and is now becoming a disease of concern among non-communicable diseases. Diagnostic criteria of PCOS had some controversies after introduction of Rotterdam criteria which were revised as NIH 2012 extension of ESHRE/ASRM 2003 which recommended broader Rotterdam/ESHRE/ASRM criteria with further classification into specific PCOS phenotype. Here, two out of three criteria are required to diagnose the cases as in Rotterdam's 2003 classification along with identification of specific phenotypes, 'A' being combination of all three, 'B' is hyperandrogenism with ovulatory dysfunction, 'C' is hyperandrogenism with Polycystic ovarian morphology, 'D' is ovulatory dysfunction with Polycystic ovarian morphology. [7]

Insulin resistance is considered to be the most important factor in pathogenesis of PCOS and metabolic syndrome. There is evidence of insulin resistance being a strong and independent factor for depression in patients with PCOS. [8,9] The genetic variation in the control of insulin metabolism in different populations is believed to have effect on expression of the disease along with the environmental factors. South Asian women with anovulatory PCOS have greater insulin resistance than anovulatory white Caucasians with PCOS. [10] Other proposed mechanisms of increased risk of mood and anxiety disorders in these women include elevated androgens, abnormalities in hypothalamic pituitary adrenal axis and increased inflammatory markers. [11] Among adolescents and young women, the psychosocial impact of physical changes such as hirsutism, acne, acanthosis nigricans

and central obesity can lead to low self-esteem in women and lead to depressive illnesses. The reported prevalence of hirsutism in women ranges from 50% to 89% [12,13] and in our study 82.19% women with PCOS had hirsutism. Acne are reported in 20-40% of women with PCOS in literature. [14] The long-term consequences of PCOS include malignancies (like breast, colorectal, endometrial and pancreatic cancers), depression, anxiety, Type 2 DM, sleep apnoea and metabolic syndrome which is a risk factor for cardiovascular disease. [15]

In our study, we observed that anxiety was prevalent in both PCOS and control group. Participants with mid anxiety were comparable in both groups, however when moderate to severe anxiety were collectively assessed in both groups the difference was statistically significant with more prevalence in PCOS group 30.13% vs 11.54% with overall incidence of anxiety in PCOS group being 56.16%. In literature, prevalence of anxiety in women with PCOS is reported to be from 34% to 57%. [16-19,21] High prevalence of anxiety was observed in a study from Australia in PCOS was reported with total of 47% diagnosed with anxiety (21% with mild anxiety and 36% with moderate to severe anxiety). [18] Upadhyay et al, reported 28% women with increased anxiety scores. [19] It has been observed that women with PCOS show enhanced HPA axis and heart rate reactivity to stress and thus are more prone to anxiety. [20]

In cases of depression, prevalence of mild depression was comparable in both groups in ours study. Moderate to severe depression was more prevalent in PCOS group (17.8%) than in control (5.13%) which was significant statistically. Damone et al, reported prevalence of depression as 27.3% in their study of 478 women with PCOS (vs 18.8% in control group). [21] Prevalence of depression varies from 27% to 64% in literature. [21-24]

Our findings corroborate with the two recent meta-analysis. Blay et al, in 2016 in a meta-analysis of five studies on anxiety revealed higher rates of anxiety in PCOS group than controls (OR 2.76) and meta-analysis of six studies on depression revealed higher rates of depression in PCOS group (OR 3.51). [16] Another meta-analysis in 2017 by Cooney et al, revealed higher odds (increased 4.18 times) of moderate to severe anxiety in PCOS group in 11 studies and higher odds of moderate to severe depression (OR 6.55) in a meta-analysis of 9 studies on depression. The overall reported incidence in this analysis for depression was 3 times higher and for anxiety was 5 times higher in PCOS group. The median prevalence for depression was 36.6% with interquartile range of 22.3%-50% and the median prevalence of anxiety was reported as 41.9% with interquartile range of 13.6% to 52%. [17]

On assessing risk of eating disorder in our study, the prevalence of high scores was higher than that found in literature in both PCOS (31.51%) and control group (32.05%), but there was no statistically significant difference in results of two groups. Stress and anxiety are known to affect eating habits and chronic stress can lead to eating disorders. Although, in our study there was no increased risk assessed in women with PCOS for eating disorders but PCOS group had significantly higher percentage of women who were overweight (61.64%) and Cooney et al reported similar findings in their meta-analysis. [17] Karacan et al, in a study of adolescents and young women found no difference in body dissatisfaction and eating attitudes in PCOS and non PCOS group. [24] Lee et al, reported significantly higher mean scores on eating disorder questionnaire in women with PCOS than without PCOS. On assessment of quality of life, women with PCOS with eating disorder had poorer scores suggesting that it negatively impacts the quality of life of these women. [25] Although eating disorder risks are considered to be more in women with PCOS we did not find similar results in our study population when compared to control population.

CONCLUSION

From this study, we conclude that women with PCOS are more prone to anxiety and depression with higher prevalence of moderate to severe anxiety and depression than those without PCOS. Central obesity is more common in PCOS women. Hence, routine assessment for anxiety and depression in women with PCOS and early intervention can help reduce the morbidity associated can also help improve the quality of life of these women.

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