

Depression and Anxiety in Women with Polycystic Ovary Syndrome and Its Biochemical Associates

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ABSTRACT

Objective: To assess the prevalence of mood depression and anxiety in women with prospectively diagnosed polycystic ovary syndrome (PCOS).

Materials and methods: A cohort study at Fatima Memorial Hospital was conducted with a total of 137 patients with PCOS and a similar number of controls, attending gynecology clinic; all participants of the study were required to complete hospital anxiety and depression scale (HADS) questionnaire. Later the biochemical assessment was done between PCOS with depression to PCOS without depression in order to find its associates.

Results: Study shows an increased prevalence of depression and anxiety in women with PCOS as compared to control, general population.

Keywords: Anxiety, Depression, Infertility, Polycystic, Psychological issues.

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INTRODUCTION

Polycystic ovary syndrome (PCOS), also called hyperandrogenic anovulation (HA) or Stein-Leventhal syndrome is one of the most common endocrine disorders among women. It produces symptoms in approximately 5 to 10% of women of reproductive age.¹

The most common immediate features are anovulation, excess androgenic hormones and insulin resistance. Anovulation results in irregular menstruation, amenorrhea and ovulation-related infertility. Hormone imbalance generally causes acne and hirsutism. Insulin resistance is associated with obesity, type 2 diabetes and high cholesterol levels.²

Diagnosis of this syndrome requires presence of clinical and/or biochemical features of hyperandrogenism, menstrual disorders or amenorrhea with chronic lack of ovulation, and the presence of polycystic ovaries on ultrasonography after the exclusion of other endocrine disorders.³

The symptoms of PCOS as hirsutism and acne affect a woman's physical appearance and infertility and obesity are perceived as social stigma and can ruin one's self-esteem. The overall effect on a woman's life is profound, resulting in personal, family and workplace problems.⁴ So, it is natural to suggest that women with PCOS are at an increased risk of experiencing mood dysfunction and psychiatric problems. Hollinrake et al (2007) discussed that out of these depression and anxiety are most common.⁵

Depressive disorders are defined as a deep and persistent lowering of mood. According to the data from the National Institutes of Health (NIH), depression affects about 5% of the population in a year, and 13% of people during their whole life.

According to a literature review by Accortt et al, women suffer from it almost twice as often as men. The prevalence of depression in women with PCOS is higher and more variable (28 to 64%) than for women in the general population.⁶

Anxiety disorders are a group of mental disorders characterized by feelings of anxiety and fear, where anxiety is a worry about future events and fear is a reaction to current events. The prevalence of anxiety in women with PCOS ranges from 34 to 57%⁷ yet again a higher prevalence than for women in the general population.

The reasons for a higher prevalence of anxiety and depression in women with PCOS are not clearly understood. According to some researchers, physical symptoms of PCOS are more distressing. However, they are backed up by inconsistent evidence. Some studies support that acne, hirsutism and body mass index (BMI)

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lead to increased psychological distress, other studies found no such link.⁸ Insulin resistance is also considered to be responsible for depression.⁹ It is safe to assume that a multitude of factors contribute to the high prevalence of both anxiety and depression in women with PCOS.

The aim of the present study is to estimate the prevalence of psychological disorders in women with PCOS and to determine the role of androgens and other metabolic markers associated with PCOS in the development of psychological disorders.

MATERIALS AND METHODS

A cohort study was conducted at Fatima Memorial Hospital from January 2013 to July 2014, including women 18 to 45 years visiting Reproductive Endocrinology, Infertility Clinic and Gynecological Outpatient Department (OPD).

Sample size was calculated by using previous studies that reported a difference of at least 20% in the prevalence of anxiety. We also used the similar magnitude of difference with 90% power to show a difference in a portion of 20% in anxiety and depression with two-sided p-value of 0.05.

All women who were diagnosed with PCOS who were not suffering from any pre-existing mental or medical illness except PCOS were included in the study and controls included women who had regular menstrual cycles in absence of hirsutism and acne attending gynecology OPD.

Clinical data included measurement of height, weight, blood pressure, hirsutism and transvaginal scan.

Women with PCOS had laboratory tests included fasting glucose, total insulin, total cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL), triglycerides, thyroid stimulating hormone, free T4, physical research laboratory (PRL), dehydroepiandrosterone sulfate (DHEAS), 17 alphaOHP and SHBG.

All women (PCOS and control) were given hospital anxiety and depression scale (HADS) questionnaire in order to assess the prevalence of depression and anxiety among PCOS women.

In order to study the association of metabolic markers with depression and anxiety, these metabolic markers were studied and compared among PCOS women with depression and anxiety to those with PCOS without depression.

RESULTS

A total of 137 patients with PCOS and a similar number of controls, attending gynecology clinic were enrolled and completed the required HADS questionnaire. Table 1 shows the demographic characteristics and potential moderators for depression, both group sharing similar

characteristics in terms of age, BMI, educational status, employment and family history of depression. Infertility was one factor that was significantly higher in the PCOS group (45.9%) as compared to the control group (21.1%) and could be due to recruitment of patients from endocrinology and infertility clinic.

In our study (Table 2), it showed a high prevalence of anxiety and depression as compared to control group.

In order to investigate the possible causes of depression, we compared the PCOS group with and without depression (Tables 3 and 4). The demographic variables and potential moderators were compared followed by comparison of laboratory investigations. We did not find significant difference in ovarian and adrenal androgen level in both groups. Whereas we found higher fasting insulin levels and impaired fasting glucose among PCOS depressed group showing high insulin resistance as compared to nondepressed PCOS group. However, we did not find any difference in lipid profiles, cholesterol, HDL, LDL and triglycerides.

DISCUSSION

This is the first formally conducted study conducted in a hospital of Pakistan, to assess the degree of psychological issues like anxiety and depression in women with PCOS.

Table 1: Comparison of demographic data and potential moderators of depression in women with PCOS and control subjects

	PCOS (n = 137)	Control (n = 137)
Age (mean ± SD)	25 ± 8.6	26 ± 8.3
	73.96	
BMI (kg/m ²) (mean ± SD)	33.6 ± 7.1	27 ± 5.3
<i>Education</i>		
Schooling	76 (55.4%)	63 (45.9%)
College	61 (44.5%)	74 (54.0%)
<i>Marital status</i>		
Single	34 (24.8%)	23 (16.7%)
Married	86 (62.7%)	91 (66.4%)
Widow/separated/divorced	17 (12.4%)	21 (15.3%)
<i>Employment status</i>		
Self-employed	27 (19.7%)	24 (17.5%)
Full time	69 (50.3%)	56 (40.8%)
Housewife	41 (29.9%)	57 (41.6%)
Family H/O depression	16 (11.6%)	19 (13.8%)
Trying to conceive	63 (45.9%)	29 (21.1%)
Delivery within last 6 months	7 (5.1%)	3 (2.1%)

Table 2: Anxiety, depression in PCOS women and comparison with nonPCOS obese women

	PCOS (n = 137)	NonPCOS (n = 137)	p-value
HADS anxiety	21 (15%)	11 (8%)	0.05*
HADS depression	41 (30%)	12 (9%)	< 0.0001**

*Significant p-value; **Highly significant p-value

Table 3: Comparison of demographic variables and potential moderators within PCOS group

	<i>PCOS with depression</i> (n = 41)	<i>PCOS without depression</i> (n = 96)
Age (mean ± SD)	25 ± 6.1	25 ± 3.2
BMI (kg/m ²) (mean ± SD)	33 ± 7.9	32 ± 8.3
<i>Education</i>		
Schooling	22 (53.6%)	54 (56.2%)
College	19 (46.3%)	42 (43.7%)
<i>Marital status</i>		
Single	11 (26.8%)	23 (23.9%)
Married	24 (58.5%)	62 (64.5%)
Widow/separated/divorced	6 (14.6%)	11 (11.4%)
<i>Employment status</i>		
Self-employed	7 (17%)	20 (20.8%)
Full time	19 (46.3%)	50 (52%)
Housewife	15 (36.5%)	26 (27%)
Family H/O depression	5 (12.1%)	11 (11.4%)
Trying to conceive	19 (46.3%)	44 (45.8%)
Delivery within last 6 months	3 (7.3%)	4 (4.1%)

Table 4: Comparison of biochemical variables in PCOS with and without depression

	<i>PCOS with depression</i> (n = 41)	<i>PCOS without depression</i> (n = 96)
T (ng/dl)	56.5 ± 37.8	54.2 ± 31.5
Free (pg/ml)	6.9 ± 4.7	6.3 ± 4.1
DHEAS (ng/ml)	1889 ± 1413	1971 ± 1394
P (ng/dl)	64.5 ± 51.6	68.3 ± 39.1
Fasting insulin (µU/ml)	31.7 ± 24.1	14 ± 11.4
Fasting glucose (mg/dl)	98.6 ± 13.3	85.3 ± 14.9
Cholesterol (mg/dl)	186.3 ± 22.4	183 ± 29.8
HDL (mg/dl)	44.1 ± 8.6	50.3 ± 6.6
LDL (mg/dl)	118.6 ± 28	121 ± 29
Triglyceride (mg/dl)	168.8 ± 9.6	129 ± 6.5

The results show a statistically significant prevalence of depression and anxiety when compared with the control group. The strength of the study lies in, when comparing the potential moderators for anxiety and depression, were almost similar among two groups especially obesity and family history of depression. This study also favors the fact that depression in PCOS women is independent of obesity. However, infertility could add to depression and could be a bias in our study, since the statistics of infertility are higher in our group.

The outcome measure used is HADS, which gives us better screening values about anxiety and depression assessment of the same patient in the medical setting. We used HADS, taking into account being a self-report questionnaire, consisting of 14 nonthreatening items, used in over 700 scientific papers, takes few minutes to complete and easy for patients to fill. Each of the statement

intentionally excludes symptoms like loss of appetite and sleeping problems, common of other physical illnesses. It is an ideal screening tool since studies have found, even with translated versions, it shows moderate to strong correlation, with good internal consistency.¹⁰

Anxiety and depression are very common illnesses in women with endocrinal disorders. Polycystic ovary syndrome is a multifaceted disorder with multiple potential risk factors.¹¹ This study points the importance to assess any direct relationship between depression and PCOS. Biochemical markers used in these studies were the tools to assess this direct relationship rather than potential risk factors. Many studies have shown correlation between physical and biochemical hyperandrogenism with depressive illnesses in women with PCOS,¹² whereas no such observation have been made in our study. We did not find any significant difference in ovarian and adrenal androgen levels in PCOS with and without depression group.

In our study, we found raised fasting insulin levels and impaired fasting glucose levels: suggestive of insulin resistance among women with PCOS and depression as compared to PCOS women without depression. There are conflicting results in past literature, showing effect of insulin resistance on depressive disorders.¹³ There are a limited number of studies done to examine the relationship between depression and insulin resistance: based on the fact that depression is highly prevalent among type 2 diabetics. Several pathophysiological factors are responsible for depression in patients with insulin resistance including hypothalamus pituitary adrenal hyperactivity. Whereas patients with depression have also increased cortisol, increased sympathetic activity, and decreased CNS serotonin features are also seen in women with insulin resistance.¹⁴

Some researchers have predicted an increased risk of depression and anxiety with the time duration required to diagnose PCOS. Hence, longer the time required to diagnose higher is the prevalence of anxiety and depression. We did not take into account such factor in our study, which could be a limitation to our study.¹⁵

CONCLUSION

Our study shows an increased prevalence of depression and anxiety in women with PCOS as compared to control, general population. We should do comprehensive assessment of all women with PCOS for anxiety and depression in our outpatient department and should manage them with appropriate personal. Regular screening, assessment and treatment of these with appropriate professional will improve self worth and ultimately effective management of women with PCOS.

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