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Research Article

The Relationship between Polycystic Ovary Syndrome and Psychological Symptoms

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Abstract

Background: Polycystic ovary syndrome (PCOS) is a common metabolic and endocrine disease among women of reproductive-age, which cause prone to psychological symptoms.

Aim: The aim of the study is to assess the relationship between PCOS and psychological symptoms.

Method: This case control study was conducted in the Gynecology Clinic of a Private University Hospital, Ankara, Turkey in 2016. The study conducted on patients with PCOS who received therapy in Gynecologic Oncology Center of a Private University Hospital in Ankara, Turkey. A total of 80 women with PCOS were administered The Survey Form, Beck Anxiety Index, and Beck Depression Index.

Results: The PCOS group showed significantly higher scores of anxiety and depression symptoms compared to controls (p<,05). Age, education, marital status and income level were significantly associated with anxiety and depression scores of women with PCOS (p<,05).

Conclusion: Women with PCOS are at risk for anxiety and depression. These results emerged the need of emotional support into clinical process with appropriate interventions as an additional therapy to improve life quality for women with PCOS. Further studies are need to broader understanding of this area.

Keywords: Anxiety, depression, polycystic ovary syndrome, endocrine disorders

1. Introduction

Polycystic ovary syndrome (PCOS) is a heterogeneous disorder that affected by biochemical, psychological, behavioral and environmental factors. PCOS also can be described as the most common endocrinopathy in reproductive age women [1,2]. Clinical signs of PCOS include elevated luteinizing hormone and gonadotropin–releasing hormone levels, whereas follicular-stimulating hormone levels are muted. Although the genetic etiology of PCOS remains unknown, it can be associated with psychiatric disorders [3-14]. Certainly, PCOS can cause inhibition of follicular development and its symptoms may play a role on mental problems as contributing effects such as obesity, facial hirsutism, menstrual disturbance, alopecia, and acne. Especially, PCOS is one of the leading causes of infertility, which may have a negative impact on physiological well-being for many women. As a result of all these health risks and clinical manifestations of disease, current studies confirmed that women with PCOS are significantly more vulnerable to emotional distress such as anxiety, depression, anger, hostility, panic and bipolar disorder, low self-esteem, irritability, tension, social isolation, and eating disorder than others [15-29].

The reproductive and metabolic features of PCOS are sometimes reversible with effectively lifestyle modifications such as weight reduction and regular physical activity. Treatment goals should include regulating ovulation and inhibiting the action of androgens [30,31].

1.1. Aim: The aim of the study is to determine the relationship between PCOS and psychological symptoms.

2. Method

2.1. Design, time, place, population and sampling

This case control study was conducted in a private University Hospital of Gynecology Unite in Ankara, Turkey. The population of the study consisted of 40 women with PCOS who were referred to the study center between Jan and May 2016. Concurrently, we enrolled 40 outpatients without PCOS when day visited the study center for their routine

gynecologic examination as control group in this study. In total, 80 patients were included by convenient sampling in this study.

2.2. Patient selection criteria

The patients; being aged 18 and above, women with PCOS in only cases group (confirmed by the patient chart), did not have a severe illness, physical handicaps and who agreed to participate in the study. Pregnant or postmenopausal women were excluded from the research.

2.3. Data collection and application

Three instruments were used for data collection by the researcher through face-to-face interviews with patients; 1) Survey Form, 2) Beck Depression Index-BDI, and 3) Beck Anxiety Index-BAI. Each interview took about 20-30 minutes.

1) The Survey Form: This form contained 20 questions from review of the literature [5-29], including socio-demographical characteristics (age, education, income, social security, working status, family type, marriage, smoking and alcohol use etc.) as well as their disease history.

2) Beck Depression Inventory-BDI: This Index is a Likert-type scale consisting of 21 multiple-choice items, each scored from 0 to 3. Total score changes between 0 and 63. It is used in clinical applications in order to determine the density of depression. Maximum score of scale is 63 points and the cutting point accepted to determine clinical depression is 17. It was stated that the scores equal to or above 17 are descriptive of depression, which may require treatment with a correctness level of 90%. Distribution of depression score is as follows: 0-10 points show that there is no depression; 11-17 points indicate mild level of depression, 18-29 points indicate medium level depression; 30-63 points indicate severe depression [32]. Hisli (1989) conducted a validity reliability study in 1988 for Turkish application (Cronbach alpha value=,74 [33].

3). Beck Anxiety Inventory-BAI: This index is a Likert-type clinical scale consisting of 21 articles in order to measure anxiety level. The patient is asked to evaluate symptoms for "the last one week including today." Each symptom is evaluated in a scale consisting degrees "never", "mild level", "medium level", and "severe". Total score changes between

0 and 63 [34]. Ulusoy et al (1998) determined that there is internal consistency in the use of the BAI scale with Turkish patients (Cronbach alpha=,81). Anxiety levels of patients were classified according to the scores received in BAI: 0-17 point indicates mild level, 18-24 point indicates medium level, and 25 and above indicate severe anxiety. This is to say that as BAI scores increase the severity of depression anxiety increases, as well [35].

2.4. Analysis of data

The data were analyzed using the SPSS version 19.0 (SPSS Inc., Chicago, IL). Percentage distribution, means and standard deviation of the scale scores were given in descriptive statistics. The data obtained from subjects in groups were analyzed by using χ^2 (chi-square) significance test for categorical variables. For continuous variables, the Student t test and variance analysis were conducted. Tukey HSD tests were performed to identify the source of difference in the variables that are found to be significance in the analysis of variance. P<,05 was considered as significant.

2.5. Ethical explanation

The study was conducted following receiving approval of the Ethics Review Committee of the university where the research was carried out. Participation in the survey was voluntary and anonymous. Prior to data collection, participants were informed about the purpose and duration of the study. Informed consents were obtained and the subjects were informed that they could withdraw from the study at any time.

3. Results

The socio-demographic data of the subjects are presented in Table 1. The mean age of women was 28.6 ±7.4 (min.19-33). 60 % of women were under 30 years old, 65% were university graduates, 71,2% were single, 68,8% were unemployed, 81,3% had a good income, 58,7% were smoking, and 18,7% were drinking alcohol. There were no statistically significant differences in age, education, working status, family type, and habits between the groups (p>,05), (**Table 1**). All participants had social status. None of them had children.

Socio Demographical Characteristics	GROUPS				Total		Statistical Analysis*
	PCOS (n = 40)		Control (n = 40)				
	N	%	n	%	n	%	
Age							
< 30	26	65,0	22	55,0	48	60,0	x^2 = ,121
≥ 30	14	35,0	18	45,0	32	40,0	p= ,320
Education							
High School	16	40,0	12	30,0	28	35,0	x^2 = ,111
≥ University	24	60,0	28	70,0	52	65,0	p= ,217
Marital status							
Married	13	32,5	10	25,0	23	28,8	x^2 = ,710
Single	27	67,5	30	75,0	57	71,2	p= ,513
Employment							
Employed	14	35,0	11	27,5	25	31,2	x^2 = 1,126
Unemployed	26	65,0	29	72,5	55	68,8	p= ,331

Income							
Good	31	77,5	34	85,0	65	81,3	$x^2 = ,631$
Medium	9	22,5	6	15,0	15	18,7	p= ,715
Smoking							
Yes	25	62,5	21	52,5	47	58,7	$x^2 = 1,303$
No	15	37,5	19	47,5	33	41,3	p = ,322
Alcohol drinks							
Yes	9	22,5	6	15,0	15	18,7	$x^2 = 2,181$
No	31	77,5	34	85,0	65	81,3	p = ,204
Total	**40**	**100,0**	**40**	**100,0**	**80**	**100,0**	

* Chi Square test was used.

Table I: Basic characteristics of patients with PCOS and controls

All participants had social status. None of them had children.

In the PCOS group, the total mean score of the women in the BAI was 10,41±4,15 and BDI was 25,13±11,82. In the control group, the total mean score of the women in the BAI was 5,25±4,14 and BDI was 18,80±8,11. Anxiety and depression rates in the women with PCOS were higher than those in the control group (p<,05), (**Table 2**). The prevalence of depression (65% vs. 30%) and anxiety (80% vs. 40%) was also higher in patients with PCOS compared to the controls (both p < ,05), (**Table 3**).

	GROUP			
TEST	**PCOS Mean±SD**	**Control Mean±SD**	**t***	**P**
BAI	10,41±4,15	5,25±4,14	10,125	**,001****
BDI	25,13±11,82	18,80±8,11	12,113	**,001****

*Student t test was used. **p<0,05

Table 2: BAI and BDI scores in patients with PCOS compared to controls

GROUPS	Index	STATISTICS		
		Number	**%**	**p ***
Experiment Group	**BDI** (65%) doesn't exist mild medium	14 9 17	35,0 22,5 42,5	
	BAI (80%) doesn't exist medium severe	8 10 22	20,0 25,0 55,0	**,001****
Control Group	**BDI** (30%) doesn't exist mild medium	28 4 8	70,0 10,0 20,0	
	BAI (40%) doesn't exist mild medium	24 10 6	60,0 25,0 15,0	

* Chi square test was used. **p<0,05

Table 3: BDI and BAI percentage distributions of PCOS and control groups

In Table 4, when some socio-demographic characteristics and anxiety / depression mean scores were compared in the PCOS group, it was observed that the depression ($x^2 = 3,114$, p= ,040) and anxiety scores ($x^2 = 4,156$, p= ,021) of the 30-year-old and over group were higher than the group under 30 (p<,05). There were significant difference between low income level and depression ($x^2 = 4,341$, p= ,045), anxiety ($x^2 = 6,722$, p= ,024) score average (p>,05). It was found that women with low education experienced more depression ($x^2 = 5,524$, p= ,038) and anxiety ($x^2 = 7,813$, p= ,007. Married women had more high level depression ($x^2 = 3,001$, p= ,033) and anxiety ($x^2 = 5,213$, p= ,030). Although not included in the table, there was no significant relationship between smoking- alcohol habits and anxiety/depression mean scores (p>,05).

Index	Age 28.6 ±7.4 (19-33)	Min	Max	Mean + SD	F*	p
BDI	26-29	1	20	8,10±3,41		
	≥30	3	12	11,30±3,20	3,114	,040**
BAI	26-29	6	41	22,10±10,28		
	≥30	10	42	26,92±11,10	4,156	,021**
	Income					
BDI	Good	1	18	7,85±4,86		
	Medium	6	20	9,60±3,95	4,341	,045*
BAI	Good	6	41	24,92±13,20		
	Medium	14	42	30,14±11,12	6,722	,024**
	Education					
BDI	High School	5	12	10,57±5,42		
	≥University	3	20	8,25±2,21	5,524	,038*
	High School	15	44	35,50±9,74		
BAI	≥University	10	42	26,79±10,90	7,813	,007**
	Marriage					
BDI	No	1	20	10,22±4,30		
	Yes	5	13	8,50±3,62	3,001	,033*
	No	7	44	22,21±11,37		
BAI	Yes	10	39	25,23±12,25	5,213	,030**

* Variance analysis was used (Tukey HSD test in advanced analysis), **p<0,05.

Table 4: Comparison of Socio-Demographical Characteristics of PCOS Group with BDI and BAI Score Averages

Discussion

PCOS is a common disorder affecting up to 15-20% of women in the reproductive age [1,2]. The neuroendocrine systems are crucial not only in reproductive function, but also in mood regulation. Several aspects of the PCOS can potentially cause considerable emotional problems, especially high level of androgen and fertility problems have been linked to higher risk of mental problems [36,37]. In the present study, the prevalence of anxiety and depression was high in women with PCOS. Similar to our findings, other researchers showed that the anxiety among women with PCOS was high level and about one-third of the women suffered from psychiatric symptoms [38-43]. In this study, women with PCOS, especially those who are obese with metabolic syndrome had higher anxiety and depression subscale scores (p<,05). This findings support previous studies indicating that PCOS is clearly associated with psychological disorders such as depression and anxiety. In the same studies also showed that women with PCOS are at risk for disorganized eating behavior, impaired self-esteem and sleeping problems [6,8-10-13,36,41-44]. However, a recent study presented by Cooney et al (2017) reported that the group with PCOS had a 3 fold increased risk of depression and a 4 fold increased risk of anxiety compared to group without PCOS [37]. In a cross-sectional study, women with PCOS had more severe anxiety, negative body image and social phobia compared to controls and lower appearance evaluation was associated with depression [38]. Contrary, other study presented by Benson et al (2008) stated that there were not a connection between PCOS and depression symptoms [40].

In the different studies lifestyle interventions such as regular physical activity, healthy diet, weight loss and habit modifications for women with PCOS have been found to be effective in reducing mild-moderate depression and anxiety [19-21,25,29,30]. Mental problems are undoubtedly a serious complication in women with PCOS. Screening and minimizing emotional symptoms through consultation with an expert is very important, as it can reduce motivation in the management of the disease. Moreover, untreated mental problems may worsen the outcome by increasing the risk of suicide attempts, comorbidity or functional disability, worsening overall symptoms related disease [31,40]. According to the most recent international PCOS management guidelines, educational programs, social support strategies, lifestyle interventions (preferably all three of the following: diet, exercise, and behavioral management strategies) with a multidisciplinary approach, non-pharmacological and complementary/alternative therapy besides medical treatment such as cupping, acupressure, acupuncture, herbal, dietary supplements, yoga, aerobic, and meditation should be recommended in all PCOS patients to enhance quality of life of these women [15,16,28,42-48].

In this study, age, education, income and marital status had influence on the prevalence of anxiety and depression in women with PCOS (p<,05). This study consisted with previous studies showing that the advanced age with low income status or the longer time to PCOS diagnosis predicted increased mental problems. According to the literature, the social pressure to have a child after marriage and loss of regular menstruation are common in many societies during marriage, Therefore, marriage can have social consequence. In addition, this cultural approach may interfere with female role expectations, which may further increase the risk for anxiety and may cause profound emotional distress in affected women as a contributing factor. Prior studies have also established links between emotional distress and socio-cultural characteristics in women with PCOS [9,20,28,31,40]. On the other hand, recently published study by Himelein and Thatcher (2006) on American women with PCOS provided no convincing support for a pivotal role of infertility in terms of mental problems [43]. In addition, other studies comparison between psychological symptoms in women with PCOS showed no significant difference in socio-demographic features [41,42].

Conclusion

In conclusion, PCOS and related symptoms increased risk of depression and anxiety. Therefore, mental problems should be considered in treating

women with PCOS as part of comprehensive clinical care for successful engagement at their initial visit. Additional strategies on effective PCOS lifestyle management would be beneficial. Ultimately, further studies with a larger sample are still required to get more information and to confirm these findings.

However, our findings highlight the importance of considering the socio-demographic characteristics and habits for each woman with PCOS to ensure correct approach for alleviating psychological symptoms. Also, the data of this case controlled study were based on psychoanalytic scale of the women by face-to-face interview instead of retrospective patient chart based reports. In this sense, it is thought that the scientific data obtained from this study will greatly emphasize the importance of the subject.

Competing interest

There are no conflicts of interest.

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