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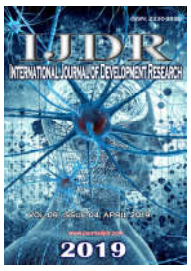

RESEARCH ARTICLE OPEN ACCESS

DEPRESSION IN WOMEN WITH POLYCYSTIC OVARY SYNDROME

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a major public health problem referred as one of the most common endocrine disorders affecting about 6-8% women of reproductive age. Several psychological (i.e., depression, anxiety, body image, social anxieties) abnormalities are common among women with PCOS. Available literature on the psychological (i.e., depression) factors among women with PCOS provides evidence that these various aspects of PCOS are strongly inter-related. Therefore, the present study will be done to find the association of depression in PCOS in the Indian population. This was a cross sectional study conducted on 90 women 18-45 years old. The sociodemographic data was taken and depression was measured by Beck Depression Inventory (BDI). Mean score of PCOS group was 18.09 (± 10.96) which is in the borderline range and the mean score of control group was 10.46 (±6.82) which is in the normal range. There was a significant difference between the groups. PCOS results in an increased risk of depression, thereby exposing women with PCOS to several consequences of depression. Therefore, the psychological health of women with PCOS should be considered and they should receive proper psychological guidance.

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is a major public health problem referred to as one of the most common endocrine disorders (Sanchez, 2014) with a broad spectrum of clinical manifestations affectingabout 6-8% (Azziz, 2005) women of reproductive age. A few studies among adolescents in schools reportprevalence of PCOS as 9.13% to 36% (Nidhi, 2011; Nair, 2012). Once considered a reproductive disorder acquired by adult women, it is now widely accepted that PCOS is a lifelong metabolic condition (El Hayek, 2016).All these aspects associated with PCOS have received less attention than the biomedical aspects of the condition (Farkas, 2014). Several physiological (i.e., insulin resistance, inflammation, visceral fat, infertility) and psychological (i.e., depression, anxiety, body image, social anxieties) abnormalities are common among women with PCOS (Farrell, 2010). The prevalence of depression in women with PCOS in the USA has been reported to be as high as 40% (Kerchner, 2009).

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Another study done in Germany revealed that 23.9% and 25.2% of women with PCOS scored in the mild to moderate and clinically relevant ranges of depression on the Beck Depression Inventory (BDI), respectively (Tan, 2008). Despite numerous studies, the etiology of PCOS remains elusive. Insulin resistance is considered important to the pathophysiology of PCOS (Diamanti-Kandarakis, 2006). Insulin resistance can be the result of lifestyle factors such as insufficient sleep or lack of exercise (Shigeta, 2001). A recent study conducted in Australia revealed that sleep disturbances are almost twice as common in women with PCOS compared with women of similar age without PCOS and a great association with depressive symptoms (Lim, 2016 and Moran, 2014) (Moran, 2014). Available literature on the physiological (i.e., hyperandrogenism, central obesity, inflammation, insulin resistance) and psychological (i.e., depression, anxiety, eating disorders) factors among women with PCOS provides evidence that these various aspects of PCOS are strongly inter-related (Farrell, 2010). The existence of these relationships among physiological and psychological factors strongly suggests that medical management of PCOS would greatly benefit from inclusion of psychological and behavioral

approaches (Farrell, 2010). Although there are limited studies of PCOS in India, the observational studies by endocrinologists, gynecologists, and dermatologists relate to diverse aspects of PCOS. Most of the young population does not visit health facilities until they have late sequel of the problem. Therefore, it is important to make an early diagnosis in order to prevent early and late sequel of the syndrome (Joshi, 2014). It is appropriately pointed by Gainie and Kalrathat the health budget of India is unlikely to meet the costs posed to tackling the associated multiple consequences of PCOS. It is time that this warning is heeded and at national level the disease is recognized as an important non-communicable disease (Ganie, 2011). Therefore, the present study will be done to find the association of depression in PCOS in the Indian population.

MATERIALS AND METHODS

This was a cross sectional study. All subjects were women 18-45 years old. The PCOS subjects were recruited from women visiting the Hakim Abdul Hamid Centenary hospital, New Delhi and Holy family hospital, New Delhi...Diagnosed patients by the gynaecologist according to Rotterdam criteria (Shreeve, 2013) and presence of multiple ovarian cysts on ultrasound were included in the study after due informed consent.

Sample size: Convenience sampling was used. Based on the prevalence of PCOS in india (Malik, 2014), the desired sample size was 90 subjects. Of the total number of subjects recruited, four failed to sign the informed consent. Therefore, 43women were included in the PCOS group and 43 women from the local community and universities were included in the control group.

Inclusion Criteria

- Patient diagnosed with PCOS as per Rotterdam criteria and presence of multiple cysts on ultrasound, by the gynaecologist.
- Adult female patients in the reproductive age group 18-45 years
- Patients willing to give informed consent

Exclusion criteria

- Pregnancy, breastfeeding and menopause
- Use of medication that influence reproductive function
- Women who self-reported having congenital adrenal hyperplasia, adrenal tumors,androgen-secreting tumors, thyroid disease, established type II diabetes, severe cardiovascular disease, diagnosed psychological problems, neurological and musculoskeletal disorders.

Instruments

- The sociodemographic variables were collected using a specially designed semi-structured proforma.
- Beck depression inventory scale- Was created by Beck and his colleagues. This scale measures and identifies emotional, cognitive, physical, and motivational symptoms of depression objectively. Each question has 4 options given with scores between 0 and 3. The depression score is determined by the sum of all items. Scores of 1-10 are considered normal; 11-16 as mild mood disturbance; 17-20 as borderline clinical depression; 11-30 as moderate depression; 31-40 as severe depression and over 40 as extreme depression. The internal consistency was described as around 0.9 (Wang, 2013).

Statistical Analysis: The data were pooled and statistically analyzed using IBM SPSS 23 software. The sociodemographic data and the prevalence of depression are reported in terms of frequency, percentages, mean and standard deviation wherever required. The Chi-square test was used to analyze categorical data. Comparison between the two groups was done using independent t- test. Level of significance was set at $p<0.05$.

RESULTS

Sociodemographic information: Data from 90 subjects (43 women with PCOS and 43 controls) were analyzed. No significant difference between the mean age, mean BMI,

Table 1. The sociodemographic profile of all participants

Domain	PCOS group (n=43)	Control group (n=43)	Statistical value	*P*
Age (years)	30.25 (± 7.05)	30.18 (±7.28)	0.45*	0.484
BMI (kg/m^2)	23.35 (±3.87)	22.13 (±3.38)	1.55*	0.363
Marital status *n*(%)			0.189#	0.664
Married	25 (58.1)	23 (53.5)		
Unmarried	18 (41.9)	20 (46.5)		
Children *n*(%)			3.732#	0.155
Having children	22 (51.2)	17 (39.5)		
Not having children	21 (48.8)	23 (53.5)		
Family history of PCOS *n*(%)			13.924#	0.000
Yes	26 (60.5)	9 (20.9)		
No	17 (39.5)	34 (79.1)		

*t value, #X^2 value, $P<0.05$, PCOS- Polycystic ovary syndrome.

marital status and number of children were identified between the groups. Family history of PCOS showed a significant difference between the two groups, with PCOS group showing a higher value (Table I).

Depression (Beck depression inventory): Mean score of PCOS group was 18.09 (± 10.96) which is in the borderline range and the mean score of control group was 10.46 (±6.82) which is in the normal range. There was a significant difference between the groups (Table II).

Duration of PCOS and Depression: Relationship of BDI with the duration of PCOS is shown in Table III. The results were found not statistically significant.

Table 2. Comparison between PCOS and controls

Item	PCOS group (n=43)	Control group (n=43)	*t*	*P*
BDI	18.09 (±10.96)	10.46 (±6.82)	3.87	0.008

PCOS- polycystic ovary syndrome, BDI- Beck Depression Inventory

Table 3. Comparison of BDI with PCOS duration

Item	PCOS duration		*t*	*P*
	≤1-2 years (n-16)	≥3 years (n=27)		
BDI	14.62 (± 9.33)	20.14 (± 11.48)	1.62	0.33

PCOS- polycystic ovary syndrome, BDI- Beck Depression Inventory

DISCUSSION

In our study, the mean BDI score of the PCOS group (18.09 ±10.96) was higher than that of the control group (10.46 ±6.82). The prevalence of depression as assessed by the BDI was 32% in the PCOS group. Compared to only 4% in the control group, the PCOS group showed 8-fold increase in the risk of depression, indicating a strong correlation between PCOS and depression, as reported by Cinar *et al*. (Hung, 2014; Cinar, 2011 and Sayyah-Melli, 2015). Our study reports similar results to other studies (Hussain, 2015 and Tan, 2017) that also reported higher prevalence of depression among PCOS women as compared to the controls.The explanation for the increased prevalence of depression among PCOS women can be given by the increased level of insulin and androgen in women with PCOS. This possibility is known to result in mood disturbance in PCOS patients (Ulrich, 2000). Higher level of androgens is linked to an alteration in gonadotropin-releasing hormone secretion, which results in increased luteinizing hormone (LH) secretion (Ehrmann, 2005). High insulin level also suppresses hepatic production of sex hormone binding globulin. This leads to increased levels of testosterone and therefore insulin (Balen, 2004). Though the exact pathophysiology and its mechanisms are not fully understood, it can still provide possible explanation for the increased risk of psychological disturbances. The tendency in the present study is that it is consistent with the existing literature that supports the view that the prevalence of psychological burden in women with PCOS is higher than in general population.

Limitations

This study has some limitations. Patients were recruited from few hospital only, which is a limitation in our study. The sample size is small which cannot be used to analyze depression in different phenotypes of PCOS. A large sample study is required from different hospitals.

Conclusion

PCOS results in an increased risk of depression, thereby exposing women with PCOS to several consequences of depression. Therefore, the psychological health of women with PCOS should be considered along with medical management and they should receive proper psychological guidance.

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