

Original Research Article

A STUDY ON THE FACTORS AFFECTING POLYCYSTIC OVARY SYNDROME IN YOUNG WOMEN

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Abstract

Background & Methods: The aim of the study is to study on the factors affecting polycystic ovary syndrome in young women. In the patient inquiry form, women's socio-demographic characteristics such as age, weight, height, economic status, employment status, education status, smoking and alcohol abuse, chronic disease, exercise status, family history of cancer, and menstrual irregularity were questioned.

Results: The Pearson's Chi-Square Test of Association found a significant relationship between the menstrual irregularity and suffering from PCOS ($p < 0.05$).

Conclusion: Finding the cause of the disease and the factors that aggravate the symptoms of PCOS is a way to provide treatments and solutions for this disease in person-centered medicine. This study found that the index of exercise and employment status, BMI, and chronic disease status of women affect the diagnosis of PCOS. Therefore, it is very important to determine the nutritional habits of women and increase physical and balanced activities to have a normal BMI. It is recommended that these patients become more aware of the cause of the disease, diagnostic criteria, symptoms, effective factors, and long-term and short-term health problems of PCOS in order to manage this disease with low-cost solutions such as diet and exercise.

Keywords: polycystic, ovary, syndrome & women.

Study Design: Observational Study.

1. Introduction

Polycystic ovarian syndrome (PCOS) is a common endocrine/hormonal disorder that affects women, especially after puberty. Alternatively, PCOS may be expanded as polycystic ovary syndrome. Around 5-15% of women in the reproductive age group suffer from hormonal imbalances that lead to menstrual irregularities, cysts in ovaries, infertility, and other health problems that include cardiovascular complications, type 2 diabetes mellitus (T2DM), and endometrial cancer [1]. PCOS is recognized as an important reproductive as well as a metabolic disorder since it affects the ovaries, and 40% of the affected women suffer from insulin resistance and are subsequently predisposed to developing T2DM [2]. The global prevalence of PCOS is estimated between 4% and 20% [3].

The World Health Organization (WHO) data suggests that approximately 116 million women (3.4%) are affected by PCOS globally [4]. The data on the prevalence of PCOS in India are scarce. According to the National Health Portal of India, the prevalence rate of PCOS in Maharashtra was noted to be 22.5% [5]. Another previous report from South India, which included adolescents, showed an incidence of 9.13% [6]. However, the diagnostic criteria for PCOS were different in those studies. The reasons for the development of PCOS have not yet been precisely identified. However, some previous studies show that PCOS could be linked to hereditary, lifestyle, and environmental factors that include early age of puberty, premature fetal development, family history of PCOS among first-degree relatives, physical inactivity, stress, and obesity among others [7]. It was also identified that the steroidogenic enzyme, cytochrome P450 enzymes (CYPs) related gene polymorphisms (CYP11A1, CYP17A1, and CYP19A1) could contribute to the development of PCOS.

Insulin resistance is central to the pathogenesis of PCOS, and Indians are known to have high prevalence of insulin resistance, so the prevalence of PCOS may be high in our population.

2. Material and Methods

This is a retrospective study with women aged 13-35 at Atal Bihari Vajpayee Government Medical College, Vidisha for 01 Year. This study divided women with PCOS into two groups: Women with PCOS as a case group (n=50) and healthy women (n=50). This study gathered data with the patient inquiry form. In the patient inquiry form, women's socio-demographic characteristics such as age, weight, height, economic status, employment status, education status, smoking and alcohol abuse, chronic disease, exercise status, family history of cancer, and menstrual irregularity were questioned.

Women participating in this study were classified into three groups based on the body mass index (BMI) value. Underweight for a BMI less than 18.5 kg/m², normal weight for a BMI greater than or equal to 18.5 to 24.9 kg/m² and overweight for a BMI greater than or equal to 25. The economic status of the family was determined based on the family income. It was considered a regular exercise activity if a person exercises more than three times during the week and each time for more than 1.5 hours. For alcohol abuse, study participants were classified as women who consumed more than seven drinks per month. Study participants were classified as smokers if they smoked more than five weekly cigarettes.

Statistical analysis

The data collected were systematically entered into a Microsoft Office 2019 Excel sheet and were used to prepare tables and calculate the mean and percentage. The data collected were processed using statistical software SPSS 20.0 (IBM Corp., Armonk, NY), and the chi-square test was applied to find out the significance of the results.

3. Result

Table 1: Demographic Profile

Parameter	Case	Healthy Women	P Value
Age	20.95±0.96	21.63±3.14	0.31
BMI	25.18±1.06	22.97±2.47	0.037
Height (cms)	153.93 ± 5.52	153.61 ± 4.98	0.78
Weight (kgs)	51.42 ± 13.6	46 ± 7.33	0.036

There was a significant association between two groups in terms of BMI ($p < 0.05$). It indicated that BMI of case group were higher than BMI of healthy women.

Table 2: Chronic Disease

Parameter	Case	Healthy Women	P Value
Yes	09	08	0.041
No	41	42	

There was a significant relationship between the chronic disease status and suffering from PCOS ($p < 0.05$).

Table 3: Family History of Cancer

Parameter	Case	Healthy Women	P Value
Yes	05	03	0.28
No	45	47	

There was not a statistically significant association between healthy women and women with PCOS regarding family history of cancer, smoking and alcohol abuse ($p > 0.05$).

Table 4: Menstrual Irregularity

Parameter	Case	Healthy Women	P Value
Yes	26	13	0.047
No	24	37	

The Pearson's Chi-Square Test of Association found a significant relationship between the menstrual irregularity and suffering from PCOS ($p < 0.05$).

4. Discussion

Using the Rotterdam criteria where ovarian ultrasonography is a component of diagnosis, in the same cohort, prevalence increased to 11.9%. Contrary to this using the Rotterdam criteria, have reported a lesser prevalence of 6.1% in Sri Lankan population and 6.3% in Chinese population both are community-based studies Majority of our cases were lean as only 24%

had a BMI \geq 23 Kg/m², and none was morbidly obese[8]. In contrast, 30-38% subjects are obese in other studies. Obesity can itself cause menstrual irregularity and increase prevalence of PCOS, so this could be a reason for lower prevalence of menstrual irregularity and PCOS in our cohort. In spite of lower prevalence of obesity, waist-hip ratio was abnormal in 44% of PCOS cases, highlighting that Indians have more central obesity, even at low BMI. A significant number of these girls had pre-hypertension; both these factors increasing their longterm cardiovascular disease risk. These abnormal metabolic features are evident, even at the young ages of 18-25 years[9].

The major limitation of our study was that just 40% of the probable cases came for further follow up and evaluation and a minority agreed for ultrasonography. The present findings agree with this, showing statistically worse values across all eight summary health scores and both the physical and mental component scores of the SF-12v2. Studies utilizing the SF-12v2 to assess HRQoL in women with PCOS are scarce, meaning there are limited data for comparison[10]. However, a recent case-control study found women with PCOS had poorer physical component scores compared to controls, and our findings agree with this. When the mental component score was considered, we reported a statistical difference favoring the control group, no such difference. Notably, the norm-based score for women with PCOS in our study was markedly lower. (mean 44.2, 95% CI: 42.4 to 46.1). Interestingly, another previous study that used only the raw scores (0–100) from the Bodily Pain subscale to compare women with PCOS to controls reported statistically higher bodily pain severity in women with PCOS[11]. However, the magnitude of difference is greater and mean scores lower, in the current study compared to those previously reported

5. Conclusion

Finding the cause of the disease and the factors that aggravate the symptoms of PCOS is a way to provide treatments and solutions for this disease in person-centered medicine. This study found that the index of exercise and employment status, BMI, and chronic disease status of women affect the diagnosis of PCOS. Therefore, it is very important to determine the nutritional habits of women and increase physical and balanced activities to have a normal BMI. It is recommended that these patients become more aware of the cause of the disease, diagnostic criteria, symptoms, effective factors, and long-term and short-term health problems of PCOS in order to manage this disease with low-cost solutions such as diet and exercise.

6. References

1. Hagström, M., Oja, P., & Sjöstrom, M. (2006). The International Physical Activity Questionnaire (IPAQ): A study of concurrent and construct validity. *Public Health Nutrition*, 9(6), 755–762. <https://doi.org/10.1079/phn2005898>
2. Panico, A., Messina, G., Lupoli, G. A., Lupoli, R., Cacciapuoti, M., Moscatelli, F., Esposito, T., Villano, I., Valenzano, A., Monda, V., Messina, A., Precenzano, F., Cibelli, G., Monda, M., & Lupoli, G. (2017). Quality of life in overweight (obese) and

- normal-weight women with polycystic ovary syndrome. *Patient Preference and Adherence*, 11, 423–429. <https://doi.org/10.2147/PPA.S119180>
3. Fuller, J. T., Hartland, M. C., Maloney, L. T., & Davison, K. (2018). Therapeutic effects of aerobic and resistance exercises for cancer survivors: A systematic review of meta-analyses of clinical trials. *British Journal of Sports Medicine*, 52(20), 1311–1311. <https://doi.org/10.1136/bjsports-2017-098285>
 4. Amiri, M., Bidhendi Yarandi, R., Nahidi, F., Tohidi, M., & Ramezani Tehrani, F. (2019). The relationship between clinical and biochemical characteristics and quality of life in patients with polycystic ovary syndrome. *Clinical Endocrinology*, 90(1), 129–137. <https://doi.org/10.1111/cen.13858>
 5. Dokras, A., Stener-Victorin, E., Yildiz, B. O., Li, R., Ottey, S., Shah, D., Epperson, N., & Teede, H. (2018). Androgen Excess-Polycystic Ovary Syndrome Society: Position statement on depression, anxiety, quality of life, and eating disorders in polycystic ovary syndrome. *Fertility and Sterility*, 109(5), 888–899. <https://doi.org/10.1016/j.fertnstert.2018.01.038>
 6. Bazarganipour, F., Ziaei, S., Montazeri, A., Foroozafard, F., Kazemnejad, A., & Faghihzadeh, S. (2014). Health-related quality of life in patients with polycystic ovary syndrome (PCOS): A model-based study of predictive factors. *The Journal of Sexual Medicine*, 11(4), 1023–1032. <https://doi.org/10.1111/jsm.12405>
 7. Drosdzol, A., Skrzypulec, V., Mazur, B., & Pawlińska-Chmara, R. (2007). Quality of life and marital sexual satisfaction in women with polycystic ovary syndrome. *Folia Histochemica et Cytobiologica*, 45(I), S93–S97.
 8. Kite, C., Lahart, I. M., Afzal, I., Broom, D. R., Randeva, H., Kyrou, I., & Brown, J. E. (2019). Exercise, or exercise and diet for the management of polycystic ovary syndrome: A systematic review and meta-analysis. *Systematic Reviews*, 8(1), 51. <https://doi.org/10.1186/s13643-019-0962-3>.
 9. Moran, L. J., Ranasinha, S., Zoungas, S., McNaughton, S. A., Brown, W. J., & Teede, H. J. (2013). The contribution of diet, physical activity and sedentary behaviour to body mass index in women with and without polycystic ovary syndrome. *Human Reproduction*, 28(8), 2276–2283. <https://doi.org/10.1093/humrep/det256>
 10. Thomson, R. L., Buckley, J. D., & Brinkworth, G. D. (2016). Perceived exercise barriers are reduced and benefits are improved with lifestyle modification in overweight and obese women with polycystic ovary syndrome: A randomised controlled trial. *BMC Women's Health*, 16(1), 14. <https://doi.org/10.1186/s12905-016-0292-8>
 11. Shahid R, Iahtisham-Ul-Haq, Mahnoor, et al (2022). Diet and lifestyle modifications for effective management of polycystic ovarian syndrome (PCOS). *J Food Biochem.*;46(7):e14117. doi:10.1111/jfbc.14117