Diet and lifestyle of women with polycystic ovarian syndrome in South India

Doddappa Mallappa Bannigida[1], Shivananda Nayak B[2,*], Surapaneni Krishna Mohan[3]

[1]Research Scholar, [2,3]Professor, [1]Dept. of Research, [2]Dept. of Preclinical Sciences, [3]Dept. of Biochemistry, [1]Saveetha University, Chennai, Tamil Nadu, [2]The University of the West Indies, Faculty of Medical Sciences, Trinidad, [3]Chettinad Hospital & Research Institute, Chettinad Academy of Research and Education, Rajiv Gandhi Salai, Chennai, Tamil Nadu, India

***Corresponding Author: Shivananda Nayak B**
Email: shivananda.nayak@sta.uwi.edu

Received: 11th October, 2018 **Accepted:** 22nd October, 2018

Abstract

Introduction: Polycystic Ovarian Syndrome (PCOS) affects 4-18% of reproductive women worldwide. It is observed to have associations with metabolic syndromes, psychological mentality and reproductive organs in women. Diet and lifestyle play an important role in the development of PCOS and their modification remain the first line of treatment.

Objective: To compare dietary and life style pattern in obese and non-obese women with PCOS and their respective controls.

Materials and Methods: Case control study comprising of 100 women with PCOS (50 obese and 50 non obese) and 100 women without PCOS (50 obese and 50 non obese) was conducted at Koppal, India from July 2015 to March 2018.

Results: Physical activity was decreased due to watching television and mobile addiction in obese and non-obese women with PCOS irrespective of BMI ($p<0.01$) compared to their respective controls. Women with PCOS irrespective of BMI consumed significantly more baked items ($p=<0.001$), soft drinks ($p=0.001$), junk foods like PaniPuri ($p=<0.02$), fried foods like chips and mirchi bhagi ($p=<0.03$) and less fruits and nuts compared to their respective controls ($p=<0.001$). However, consumption of ice-cream ($p=0.21$) and tea ($p=0.32$) did not show significant difference between women with PCOS and women without PCOS irrespective of BMI.

Conclusion: Our findings concluded that lack of exercise; sedentary life style and unhealthy diets are the main characteristic features in women with PCOS irrespective of BMI.

Keywords: Polycystic ovarian syndrome, Life style and diet.

Introduction

Polycystic ovarian syndrome (PCOS) is a heterogeneous disorder of women in reproductive age affecting 4-18% and the most frequent cause of hyperandrogenism. Its complex pathogenesis involves: a) hypothalamic-pituitary gonadotropin secretion abnormality, b) impaired ovary steroidogenesis. c) Insulin resistance (IR).[1]

Lifestyle is closely related to physical and mental health of people, and is effective in onset or development of many diseases including PCOS. Although obesity has not been mentioned as a diagnostic criterion, it is a major factor in incidence and intensity of the PCOS. Obesity aggravates the clinical presentation of the disease in terms of both fertility and metabolism.[2] women with PCOS have shown 30-40% progression to type 2 diabetes (T2D), adipose tissue dysfunction, abnormalities in lipid metabolism and body fat distribution.[3] There is no definite treatment, hence women with PCOS are treated on signs and symptoms. The most common medication include oral contraceptives (OCPs), antiandrogen topical medication and gonadotropins.[4] Low fat, hypo-caloric-dash diet and exercise has shown a 5% improvement in women with PCOS with reduction of IR, triglycerides and VLDL.[5,6]

Abnormal glucose metabolism, hyperandrogenism and ovulation significantly improves with weight loss. exercise regardless of weight loss reduces insulin resistance.[7]

Materials and Methods

This was a case-control study conducted at Koppal Institute of Medical Science, Koppal, India from July 2015 to March 2018. Study comprised 100 women with PCOS (50- obese and 50 non-obese) and 100without PCOS (controls, 50- Obese and 50 non Obese) in the age group of 18-40 years. Obese had a BMI >25 and non-obese had BMI <25. Study was approved by the institutional ethics committee. An informed consent was taken from the participants. Physical examination of each subject was carried out. The height and weight of all individuals were measured. Body mass index (BMI) was calculated by kg/m2 Diagnosis of PCOS was done according to the Rotterdam ESHRE revised consensus 2003. Women under the age of 18 years and women suffering from any known diseases, any infections, inflammatory conditions, congenital adrenal hyperplasia, hyperprolactinemia, Cushing's syndrome and those on any drug treatment were excluded from the study. IPAQ developed in 1998 in Geneva by WHO and CDC for age groups of 15-69 was used to grade physical activity. It has 27 items that report physical activity based on MET-min. week. One MET equals the amount of energy consumed in one minute of rest. IPAQ classifies people based on MET into 3 groups of low activity (<600 MET), average activity (600-3000 MET) and high activity (>3000 MET).[8]

Statistical Analysis

The mean of the data were compared using paired sample T-test and Chi-square testing from the IBM SPSS

Statistics Data Editor Version 21. Categorical data were expressed as percentage and continous data were expressed as their mean and standard deviation.

.

Results

Our study showed that BMI and waist circumference of obese and non-obese women with PCOS were more when compared to obese and non-obese women without PCOS (p<0.01). Physical activity was decreased in women with PCOS irrespective of their BMI (p <0.01). Reduced physical activity and lack of exercise was due to watching television (<0.01) and mobile addiction (<0.01). (Table 1)

Women with PCOS consumed significantly more baked items (p=<0.001), soft drinks (p=0.001), junk foods like PaniPuri (p=<0.02), fried foods like chips and mirchi bhagi (p=<0.03) and less fruits and nuts compared to their controls (p=<0.001). However, consumption of ice-cream (p=0.21) and tea (p=0.32) did not show significant difference between women with PCOS and women without PCOS. (Table 2).

Table 1: Characteristics in obese and non-obese women with PCOS and controls

	Non –obese			Obese		
Characteristics	**Cases**	**Control**	**P Value**	**Cases**	**Control**	**P Value**
BMI (kg/m2)	25.6±2.53	21.2±4.86	<0.001	35.7±3.05	32.2±4.39	<0.001
Waist circumference (cm)	95.25±2.01	94.51 ± 2.40	<0.01	105.02±7.10	102.58±8.1	<0.001
Physical activity (MET)	1809.50± 229.19	2016.8± 197.88	<0.001	350.10±30.25	550.30±25.36	<0.001
Watching Television (%)	65±18	50±12	<0.01	90±10	80±05	0.001
Mobile addiction (%)	68±12	55±18	<0.01	92±08	85±07	0.001

Table 2: Food consumed in obese and non-obese women with PCOS and controls

Foods consumed > twice a week	**Non –obese Mean± SD**			**Obese Mean± SD**		
	Cases	**Control**	**P Value**	**Cases**	**Control**	**P Value**
Cakes	0.74 ± 0.23	0.59 ± 0.12	<0.001	0.94 ± 0.50	0.86 ± 0.12	<0.001
Ice cream	0.45 ± 0.50	0.44 ± 0.21	<0.21	0.82 ± 0.30	0.81 ± 0.23	<0.21
Tea	0.64 ± 0.40	0.63± 0.61	<0.32	0.87 ± 0.20	0.86 ± 0.72	<0.32
Lack of Fruits and nuts	0.53± 0.05	0.64 ± 0.40	<0.001	0.46 ± 0.60	0.54 ± 0.73	<0.001
Soft drinks	0.78 ± 0.03	0.60 ± 0.67	<0.001	0.94 ± 0.05	0.82± 0.46	<0.001
Fast food (Panipuri)	0.58 ± 0.15	0.55 ± 0.22	<0.02	0.90 ± 0.15	0.88 ± 0.52	<0.02
Mirchi Bhagi, chips (Fried items)	0.60 ± 0.14	0.57 ± 0.51	<0.03	0.95 ± 0.14	0.92± 0.51	<0.03

Discussion

We observed that women with PCOS lack physical exercise due to sedentary life style than healthy women. Similar observations were made by Eleftheriadou et al[9] irrespective of BMI. On the contrary Moran et al.[10] in his study did not report a significant difference.

Nutritional habits are important factors in lifestyle affecting physical health.[11] In our study there was a significantly different in consumption of different food items like cakes (baked items), fast foods, fried items, soft drinks and lack of fruits and nuts. Similar findings were observed by Mohammed S et al.[12] Studies have shown increased risk of infertility with consumption of animal proteins, complete carbohydrates, foods with high glycemic index, low fat dairy, greasy foods and sodas.[13] Consumption of fruits and nuts reduce insulin resistance reported higher calorie intake and fat intake in women with PCOS.[14-16] The results of these studies are consistent with that of ours.

This is a significant finding as the foods craved for and consumed daily by women have attached metabolic signals, psychological distress, and menstrual disturbances as studies have shown the possible link of dairy foods affecting ovulatory functions Chavarro et al.[17]

Studies have shown that lifestyle modification and appropriate diet habits are 1st line treatment in women with PCOS.[13,18,19] Given the fact that in most studies, signs and symptoms improved after changing their diet and life style, it is necessary to provide them with consultation and educational services regarding appropriate nutrition. Physicians must highlight the importance of grains, vegetables and fruits as prevention to chronic disease [ACAM WJ Leaders.].[20]

Conclusion

Our findings conclude that lack of exercise and unhealthy diets are important characteristic features in women with PCOS and remain the first line of treatment.

Limitations of Study

Due to loss of follow up we could not compare their outcome after modification of diet and life style.

Conflicts of Interest: None

References

1. Khan KA, Stas S, Kurukulasuriya LR. Polycystic ovarian syndrome. *J Cardiometabolic Syndr* 2006;1:125-130.
2. Sedigheh S, Sedigheh AAA, Afrakhteh M, Esteki T, Majd HA & Mahmoodi Z. Comparison of Lifestyle in Women with Polycystic Ovary Syndrome and Healthy Women. *Glob J Health Sci* 2015;7(1):228-234.
3. Sharpless JL. Polycystic ovary syndrome and the metabolic syndrome. *Clin Diabetes* 2003;21:154.
4. Archer JS. Hirsutism and acne in polycystic ovarian syndrome. Best practice and research clinical obstetrics and gynaecology. 2004;18:737-754.
5. Rondanelli M, Perna S, Faliva M, Monteferrario F, Repaci E, Allieri F. Focus on metabolic and nutritional correlates of polycystic ovary syndrome and update on nutritional management of these critical phenomena. *Arch Gynaecol Obstet* 2014;290:1079-1092.
6. ZatollahA, MansoorehS, ZohrehT, Hossein S, Sima-SS, Ahmad E. Effects of DASH diet on lipid profiles and biomarkers of oxidative stress in overweight and obese women with polycystic ovary syndrome: A randomized clinical trial Elsevier 2014;30:1287-1293.
7. Novak, E., Berek, J., Hillard, P., & Adashi, E. (2012). Novak's gynecology (13th ed., pp. 1075-1090). London, Lippincott Williams and Wilkins.
8. Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) – Short and Long Forms. November 2005:1-15.
9. Eleftheriadou, M., Michala, L., Stefanidis, K., Iliadis, I., Lykeridou, A., & Antsaklis, A. Exercise and Sedentary Habits Among Adolescents with PCOS. *J Pediatr IC Adolesc Gynecol*, 2012;25:172-174.
10. Moran, LJ., Ranasinha, S., Zoungas, S., McNaughton, SA, Brown, WJ, & Teede, HJ. The contribution of diet, physical activity and sedentary behavior to body mass index in women with and without polycystic ovary syndrome. *Hum Reprod* 2013;28(8):2276-2283.
11. Shahedur, R, Anowar, P, Abdus, S, & Shahjahan, A. Study of the Effect of Food Habit, Lifestyle and Daily Trip on Physical and Mental Status of Subjects at Islamic University in Kushtia, Bangladesh. *Open J Statistics* 2012;2:219-223.
12. Mohammed S & Nayak BS. Exploration of Ovarian Hormones, diet and life style of women with polycystic ovarian syndrome. *Int J Curr Adv Res* 2017;1:1671-1675.
13. Altieri, P., Cavazza, C., Pasqui, F., Morsellit, A., Gambineri, A., & Pasquali, R. Dietary habits and their relationship with hormones and metabolism in overweight and obese women with polycystic ovary syndrome. *Clin Endocrinol* 2013;78:52-59.
14. Pourghassem Gargari, B., Houjeghani, S. H., Mahboob, S., farzadi, L., & Safaeian, A. Assessment of Nutrients Intake in Polycystic Ovary Syndrome Women Compared to Healthy Subjects. Iranian Journal of Obstetrics, Gynecology and Infertility. 2011; 14(4): 1-8.
15. Eman, MSA, Mohamed ES & Mohamed SES. Effect of Lifestyle Modifications on Polycystic Ovarian Syndrome Symptoms. Journal of American Science. 2012; 8(8): 535-544.
16. Douglas CC, Norris LE, Oster RA, Darnell BE, Azziz R, Gower BA. Difference in dietary intake between women with polycystic ovary syndrome and health controls. *Fertil Steril* 2006;86:411-417.
17. Chavarro J, Rich-Edwards J, Rosner B, Willett W. A prospective study of dairy foods intake and an ovulatory infertility. *Hum Reprod* 2007;22:1340-1347.
18. Barr S, Hart K, Reeves S, Sharp K & Jeanes YM. Habitual dietary intake, eating pattern and physical activity of women with polycystic ovary syndrome. *Eur J Clin Nutr* 2011;65:1126-1132.
19. Novak E, Berek J, Hillard P &Adashi E. Novak's gynecology 2012(13th ed., pp. 1075-1090). London, Lippincott Williams and wilkins.
20. ACAM WJ, Leaders A. Some New Ideas on an Ancient Disease and Modern Women.

How to cite this article: Bannigida DM, Nayak BS, Mohan SK. Diet and lifestyle of women with polycystic ovarian syndrome in South India. *Int J Clin Biochem Res* 2019;6(1):29-31.