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Original Research Article

Dietary intake and its association with body composition and hormonal profile among women with polycystic ovary syndrome from Chandigarh capital region, India

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is globally prevalent endocrine and metabolic disorder among women in the reproductive age. The present study is an attempt to assess dietary intake and their relationship with hormonal profile and body composition variables in overweight/obese and non-obese women having PCOS.
Methods: The sample consisted of 250 PCOS women, aged from 18 to 45 years living in Chandigarh Capital region (CCR) was collected from tertiary hospital. The dietary intake of PCOS women was evaluated by employing 24-hours dietary recall method for three consecutive days. The hormonal history of follicle stimulating hormone, luteinising hormone, free testosterone and fasting insulin were obtained from medical record of the patients. Visceral fat and total body fat percentage of each subject has been assessed by using bioelectrical impedance method.
Results: Analysis of the data exhibited that the intake of total energy, protein, calcium, iron, and vitamin A were higher in non-obese women than their overweight/obese counterparts, while both the groups of PCOS women depicted inadequate dietary intake as compared to RDA values. Interestingly, intake of carbohydrate and fat content of overweight/obese as well as non-obese PCOS groups was higher than the recommended dietary allowance (RDA), which may be responsible to disturb the hormonal level and biochemical characteristics in PCOS women. The luteinising hormone recorded a positive and significant correlation with fat intake (r=0.2) and calcium intake with free testosterone in overweight/obese PCOS women (r=0.2).
Conclusions: Therefore, inadequate diet intake than recommended dietary allowance in PCOS women may leads to disturb hormonal profile. Hence, diet modifications with low carbohydrate and fat intake as well as weight management is first-line strategy to control furtherance of PCOS among women.

Keywords: Body composition, Dietary intake, Hormonal level, PCOS women

INTRODUCTION

Polycystic ovary syndrome (PCOS) is globally emerging as the most prevalent endocrine disorder and its prevalence varies based on the diagnostic criteria adopted.[1,2] Wang et al highlighted a worldwide significant increase of PCOS burden among adolescent and young women irrespective of regional disparity.[3] They recorded a global increment of PCOS incidence rate by 56%, prevalence rate by 59% and disability-adjusted life years by 58% from 1990 to 2021. The prevalence of PCOS in India varied from 3.7% to 22.5% based on population studies and diagnosis criteria.[4] It is associated with negative reproductive, metabolic, as well as psychological features women in reproductive lifespan.

A perusal of the prior literature identified obesity as one major characteristics in the progression of the polycystic ovary syndrome, nevertheless conflicting findings have been noticed in various Asian population with respect to

an abnormal fat distribution and metabolic profile of lean and obese PCOS women.[5,6] The majority of PCOS women irrespective of their body mass index exhibited insulin resistance which is further responsible to exacerbate weight gain.[7-9]

Although pathophysiology of PCOS remains poorly understood, but past studies have established that insulin resistance plays a pivotal role in the PCOS etiology, they also reviewed the potential contribution of Mediterranean as well as ketogenic diet in managing women with PCOS.[10,11] A study performed by Facchinetti et al depicted that role of inositol, a carboxylic sugar, as a promising and safe strategy to alleviate the PCOS.[12] Finding of Pasquali and Casimirri, also highlighted the importance of diet in the regulation of the metabolism of sex steroids.[13] It further advocated that intervention of a western-style diet (richer in lipids and proteins and poorer in fibre and complex carbohydrates) presented a surge in androgen level among the South African women living in the rural settings. A report of Manlove highlighting an increasing prevalence of PCOS in developing nations such India and this may be attributed to rapid nutritional transitions due to intake of westernized diets as well as changes in lifestyle.[14]

The clinical and biochemical characteristics of women with PCOS are of prime importance, and various therapeutic strategies are currently being investigated to improve the menstrual irregularity and ovulatory functions. The earlier dietary interventional studies have revealed a regularity in the menstrual cycle with changes in diet.[2] Globally, the prevalence and burden of PCOS is increasing, however, there is a lack of data demonstrating the dietary pattern association with POCS. For holistic understanding, it is imperative to explore the dietary intake pattern and their relationship with hormone level and body composition variables in overweight/obese and non-obese women having PCOS.

METHODS

The present cross-sectional study was conducted on 250 PCOS women, ranging in age from 18 to 45 years and living in Chandigarh capital region (CCR). The patients who were visiting OPD of Department of Obstetrics and Gynecology of Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh from April 2018 to January 2020 were enrolled in the study. The subjects were screened as PCOS based on Rotterdam criteria (2003) and any patient with Cushing syndrome, congenital adrenal hyperplasia, androgen secreting tumors (hypothyroidism) or taking any medication affecting the endocrinal parameters of the PCOS women were not included in the study.

Ethical approval

In the present research, all participants were informed about the nature and objectives of the study. The study was conducted according to guidelines of Declaration of Helsinki and approved by the Institutional Ethical Committee of Panjab University, Chandigarh (PUIEC/2018/109/A/09/01). A written informed consent form was signed by each participant prior to being recruited into the study.

The sample size was estimated by using the expected prevalence rate of polycystic ovary syndrome among North Indian women and a study performed by Gill et al estimated it as 3.7%.[15] Sample size estimation was carried out using following formula would be 50 with 95% of confidence interval and 5% probability of type 1 error.

$$n = Z\alpha^2 \times p \times q/d^2$$

The general characteristics like age, type as well as frequency of diet was obtained using interview-based schedule. The hormonal history of follicle stimulating hormone (FSH), luteinising hormone (LH), free testosterone (FT) and fasting insulin (FI) were obtained from medical record of the patients. Anthropometric measurements height (cm) and weight (kg) have been taken on the subjects following the standards techniques given by Weiner & Lourie.[16] Visceral fat and total body fat percentage of each subject has been assessed by using bioelectrical impedance method (Karada Scan HBF-375, OMRON, Krell Precision (Yangzhou) Co., Ltd, Jiangsu, China).

All the participants were stratified into overweight/obese (overweight-BMI=23.0-27.5 kg/m^2; obese-BMI≥27.5 kg/m^2) and non-obese (underweight-BMI<18.5 kg/m^2; normal-BMI <23.0 kg/m^2) categories according to the body mass index (BMI) as per the World Health Organisation (WHO) (2004) cut-off values for Asian population. The overweight and obese women were clubbed together in one group and underweight and normal weight to non-obese category. The dietary intake of PCOS women was ascertained using 24 hours dietary recall method for three consecutive days. The interview method was employed to gather the diet information. The approximate quantity of food intake, method or mode of preparation, type and frequency of food intake was recorded. Additionally, common standardized household measures (e.g., spoons, bowls, glasses, and plates) were adopted to estimate the definite quantities of ingredients intake. The participants' nutrient intake was assessed manually using the nutritive value tables for Indian foods.[17] The total macronutrients and micronutrients intake like energy, carbohydrates, fibre, protein, fat, calcium, Vitamin A was assessed using nutritive value table for Indian foods and compared with recommended dietary allowance (RDA).[17]

Statistical analysis

All the data were subjected to analysis using statistical analysis for the social sciences (SPSS) software (version 20), Chicago, Illinois, United States. In which $p<0.05$ was considered statistically significant for all tests. Shapiro-

Wilk test was executed to ascertain normality of variables. In order to compare two groups for quantitative variables, independent t-test was performed, whereas chi-square test was applied for categorical variables. All the continuous variables were reported as mean±SD, whereas frequency variables are depicted as percentage. To predict the association between dietary intake, body composition and hormonal profile bivariate Karl Pearson correlation test was employed.

RESULTS

The demographic and general dietary characteristics of non-obese and overweight/obese PCOS women presented in Table 1. The overall frequency of PCOS women with vegetarian diet (obese women 38.4% versus non-obese women 14%) was higher than women having non-vegetarian (obese women 20.8% vs non-obese women 13.6%) and ovarian diet (obese women 10% vs non-obese women 3.2%). The highest frequency of food intake was observed thrice a day (obese women 52% versus non-obese women 25.2%), followed by twice a day (obese women 16% versus non-obese women 5.6%) and once a day (only non-obese women 1.2%). Chi-square test revealed non-significant differences for type of diet (p=4.76) as well as frequency of food intake (p=2.24).

A comparative account of body composition and hormonal parameters between non-obese and overweight/obese women with PCOS is displayed in Table 2.

Table 1: Demographic and dietary characteristics of non-obese and overweight/obese PCOS women.

Variables		Non-obese, N (%)	Overweight/obese, N (%)	Chi-square values
Marital status	Single	55(22)	94(37.6)	6.46*
	Married	22(8.8)	79(31.6)	
Occupation	Working	19(7.6)	42(16.8)	2.19
	Non-working	26(10.4)	74(29.6)	
	Student	32(12.8)	57(22.8)	
Religion	Hinduism	55(22)	112(44.8)	2.46
	Sikhism	22(8.8)	57(22.8)	
	Muslim	0(0)	3(1.2)	
	Christian	0(0)	1(0.4)	
Education	Illiterate	1(0.4)	1(0.4)	6.59
	Upto high school	0(0)	2(0.8)	
	Secondary school	14(5.6)	49(19.6)	
	Undergraduate	38(15.2)	60(24)	
	Higher education	24(9.6)	61(24.4)	
Type of diet	Vegetarian	35(14)	96 (38.4)	4.76
	Non-vegetarian	34 (13.6)	52 (20.8)	
	Ovatarian	8 (3.2)	25 (10)	
Frequency of food intake	Once	0 (0)	3(1.2)	2.24
	Twice	14(5.6)	40(16)	
	Thrice	Thrice	130(52)	

Level of significance: p<0.05*; p<0.01**

Table 2: Comparative account of body composition and hormonal parameters of non-obese and overweight/obese PCOS women.

Parameters	Non-obese, mean±SD	Overweight/obese, mean±SD	t-values	Standard range
% BF	28.5±4.2	35.9±4.0	-13.1**	20-33% approx.
%VF	2.6±1.1	8.6±4.5	-11.3**	10% of total body fat
FSH (mIU/ml)	5.1±3.0	5.3±4.5	-0.3	3.0-8.0
LH (mIU/ml)	6.7±4.2	6.9±5.2	-0.2	1.8-11.7
FT (pg/ml)	1.9±1.8	1.7±0.8	1.0	0-4.1
FI (uU/ml)	11.7±9.9	11.6±5.1	0.1	2-25

Level of significance: p<0.05*; p<0.01**; %BF=percentage body fat; VF=visceral fat; FSH=follicle stimulating hormone; LH=luteinising hormone; FT=free testosterone; FI=fasting insulin

The total body fat percentage was significantly higher among overweight/obese women (35.9±4.0) than non-obese PCOS women (28.5±4.24). The overweight/obese PCOS women (8.6±4.54) had significantly (p<0.05) higher percentage visceral fat than non-obese PCOS women (2.6±1.1) as is clear from t-test (-11.3). It is seen from the Table that the level of FSH was slightly higher among overweight/obese PCOS women (5.3±4.5) than

their non-obese counterparts (5.1±3.1), but the difference was statistically non-significant (t=-0.3). The LH concentration in overweight/obese PCOS (6.9±5.2) was higher than non-obese PCOS women (6.7±4.2), but group difference was statistically non-significant as noted from t-value (-0.2). Free testosterone amount was higher among non-obese PCOS (1.9±1.8) women than overweight/obese women (1.7±0.8).

The comparative amount of nutrient intake of non-obese and overweight/obese PCOS women with recommended dietary allowance is portrayed in Figures 1 and 2.

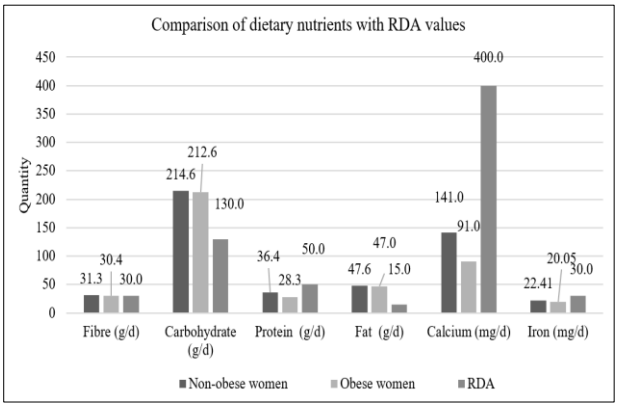

Figure 1: Comparison of nutrient intake of obese and non-obese women with RDA values.

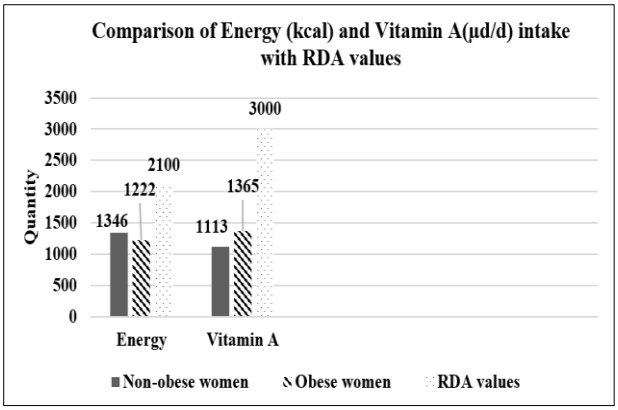

Figure 2: Comparison of energy and vitamin A intake of obese and non-obese women with RDA values.

The consumption of carbohydrates was slightly higher among non-obese PCOS women (214.6±72.6 versus 212.6±68.9) than overweight/obese PCOS women and the difference was statistically non-significant (t=-0.2, p>0.05). The mean intake of protein was significantly higher in non-obese PCOS women (36.4±12.4 versus 28.3±8.0, p<0.05) as compared to obese women. The consumption of fat did not differ significantly (p>0.05) in both non-obese as well as overweight/obese PCOS women (47.6±16.7 versus 47.0±14.7), however non-obese women had slightly higher intake of fat than their overweight/obese counterparts. The level of calcium intake was significantly more in non-obese women with PCOS than overweight/ obese PCOS women (141±1.3 versus 91±0.6, p<0.05). The intake of iron differed significantly between both the groups under study, as non-obese PCOS women had higher consumption of iron than overweight/obese PCOS women (22.4±9.5 versus 20.0±7.2, p<0.05).

It was evident from results that energy intake mean level in non-obese PCOS participants (1346.1±421.4 versus 1221.5±337.6) was significantly higher than overweight/ obese women as apparent from t value (t=2.4, p<0.05). The overweight/obese women with PCOS had significantly higher intake of Vitamin A than non-obese counterparts (1365.2±804.6 versus 1113.1±794.5) (t=10.1). The mean fibre intake of non-obese women (31.3±9.7 versus 30.4±9.5) was higher than overweight/obese PCOS women, but the difference in both the groups was statistically non-significantly as shown by t-value (0.70).

When nutrient intake of non-obese and overweight/obese women with PCOS was compared with RDA given by ICMR expert Committee (1981). It was depicted that mean values of energy (non-obese 1346.1 kcal; overweight/ obese 1221.5 kcal; RDA 2100 kcal), protein (non-obese 36.4 g/d; overweight/obese 28.3 g/d; RDA 50 g/d), calcium (non-obese 142 mg/d; overweight/obese 91 mg/d; RDA 400 mg/d), iron (non-obese 22.4 mg/d; overweight/obese 20 mg/d; RDA 30 mg/d), and vitamin A (non-obese 1113.1 µd/d; overweight/obese 1365.2 µd/d; RDA 3000 µd/d) intake of non-obese and overweight/ obese PCOS women were lower in comparison to RDA values. However, excessive fat intake level was observed among both non-obese (47.6 g/d) and obese PCOS (47.0 g/d) as compared to RDA (15 g/d) values. The mean intake of fibre of non-obese (31.3 g/d) and overweight/obese (30.4 g/d) women was comparable with the recommended dietary allowance (RDA) values (30 g/d).

Table 3 depicts the Karl Pearson correlation coefficient (r) of dietary intake of non-obese and overweight/obese PCOS women with body composition variables, hormonal characteristics and fasting insulin (Figure 3).

Table 3: Correlation (Karl Pearson) of dietary nutrients intake with hormonal, body composition characteristics and fasting insulin.

Nutrient intake		Body composition		Hormonal characteristics			Biochemical marker
		%BF	%VF	FSH	LH	FT	FI
Energy	BMI≥23 kg/m^2	r=0.0	r=-0.1	r=-0.0	r=0.1	r=-0.0	r=-0.0
	BMI<23 kg/m^2	r=0.0	r=0.1	r=-0.1	r=-0.0	r=0.1	r=-0.2*
Carbohydrate	BMI≥23 kg/m^2	r=-0.0	r=-0.1	r=-0.0	r=-0.0	r=0.0	r=-0.1

Continued.

Nutrient intake		Body composition		Hormonal characteristics			Biochemical marker
		%BF	%VF	FSH	LH	FT	FI
	BMI<23 kg/m^2	r=0.1	r=0.0	r=0.0	r=0.1	r=0.1	r=0.1
Protein	BMI≥23 kg/m^2	r=0.0	r=-0.1	r=-0.1	r=0.0	r=0.0	r=-0.1
	BMI<23 kg/m^2	r=0.0	r=0.0	r=-0.1	r=0.1	r=-0.1	r=-0.2
Fat	BMI≥23 kg/m^2	r=-0.0	r=-0.1	r=-0.0	r=**0.2***	r=0.0	r=-0.1
	BMI<23 kg/m^2	r=0.0	r=0.1	r=-0.1	r=-0.1	r=0.0	r=-0.2*
Calcium	BMI≥23 kg/m^2	r=0.0	r=0.0	r=-0.0	r=0.0	r=**0.2***	r=-0.1
	BMI<23 kg/m^2	r=0.1	r=0.2	r=-0.1	r=0.0	r=0.0	r=-0.0
Iron	BMI≥23 kg/m^2	r=-0.1	r=-0.1	r=0.0	r=-0.0	r=0.1	r=0.0
	BMI<23 kg/m^2	r=0.0	r=-0.0	r=-0.0	r=0.1	r=0.1	r=0.1
Vitamin A	BMI≥23 kg/m^2	r=-0.1	r=-0.1	r=0.0	r=0.1	r=0.0	r=-0.1
	BMI<23 kg/m^2	r=-0.1	r=0.0	r=-0.0	r=-0.0	r=0.0	r=-0.2
Fibre	BMI≥23 kg/m^2	r=-0.0	r=-0.1	r=-0.1	r=-0.0	r=-0.0	r=-0.1
	BMI<23 kg/m^2	r=-0.1	r=-0.0	r=-0.0	r=-0.0	r=0.1	r=0.1

Level of significance: p<0.05*; p<0.01**, %BF=percentage body fat; VF=visceral fat; Vit. A=vitamin A; FSH=follicle stimulating hormone; LH=luteinising hormone; FT=free testosterone; FI=fasting Insulin

An inverse weak relationship has been existing between energy intake and fasting insulin in both the groups under study, but this association showed statistical significance exclusively in non-obese women (r=-0.2, p<0.05). Fat intake of non-obese and overweight/obese PCOS women revealed a negatively weak relationship with fasting insulin, however statistically significant relationship was observed only in non-obese PCOS women (r=0.2, p<0.05). Results of our study demonstrated association of carbohydrates, fibre, protein, calcium, iron and Vitamin A intake with fasting Insulin as seen in Table 3. Percentage body fat also exhibited statistically non-significant association with energy, carbohydrates, fibre, protein, fat, calcium, iron and Vitamin A intake.

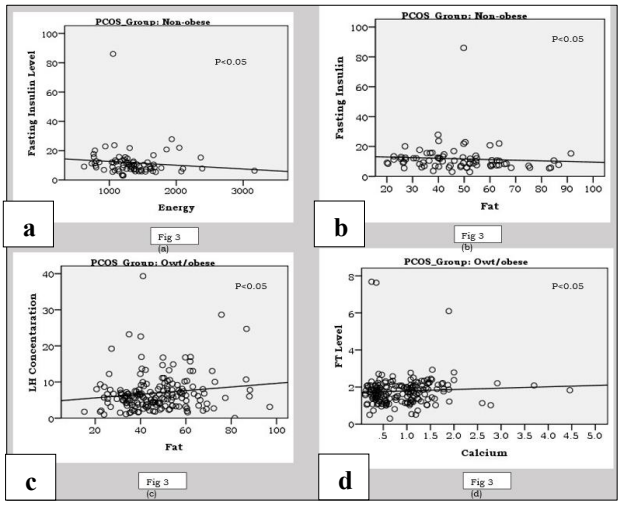

Figure 3 (a-d): Correlation between nutrients intake, hormonal and fasting insulin among overweight/obese and non-obese PCOS women.

Similar trend was noted in percentage visceral fat with energy, carbohydrates, fibre, protein, fat, calcium, iron and vitamin A intake. The results exhibited that the level of follicle stimulating hormone had negative correlation with energy intake, carbohydrates, fibre, protein, fat, calcium and iron. An opposite trend was recorded in iron and vitamin A intake of overweight/obese PCOS women, where a positive but non-significant association was noted. The LH recorded a significant and positive weak association with fat intake in overweight/obese PCOS women (r=0.2, p<0.05). The free testosterone (r=0.2, p<0.05) presented a positive and significantly weak correlation with calcium intake in overweight/obese PCOS women.

DISCUSSION

The purpose of the present research was to assess the dietary intake of PCOS women in both overweight/obese and non-obese category and to predict the association if any with body composition and hormonal characteristics with PCOS. It is established by the earlier literature that diet has a potential influence on the possible determinants of PCOS i.e., obesity as well as insulin sensitivity.[18,19] Most of the previous researches focused on the dietary, metabolic, and clinical profile of PCOS patients with non-PCOS controls, but very scanty studies were carried out to distinguish the macronutrients and micronutrients intake of overweight/obese and non-obese PCOS women.[20,21] As dietary intake is one of the primary contributing factors for the development of obesity in women with PCOS, the role of diet is predominantly crucial in clinical management of PCOS among women.

The present study results represented that overweight/obese PCOS women had inadequate dietary intake compared to their non-obese women counterparts. The non obese PCOS women exhibited higher intake of total energy (1346.1±421.4 versus 1221.5±337.6), protein (36.4±12.4 versus 28.3±8), calcium (1.4±1.3) versus 0.9±0.6), iron (22.4±9.5 versus 20.0±7.2) and vitamin A (1365.2±804.6 versus 1113.1±794.5) than their overweight/obese counterparts. The present study presented increased energy intake among non-obese women having PCOS. Similarly previous studies

suggested that insulin resistance among lean PCOS women, contributes to dysregulation of appetite and satiety signaling.[22,23] This neuroendocrine imbalance may promote increased caloric intake and altered energy homeostasis in PCOS women. In both the groups of PCOS women consumption of carbohydrates and fat was higher when compared to the values of RDA. In convergence to the findings of present study, Ahmadi et al illustrated that Iranian PCOS women consumed diet with high fat intake than control population which might be correlated with their disease.[24] Findings of Barr et al on United Kingdom PCOS women reported higher total energy (8390 kJ versus 6920 kJ) and fat intake among PCOS women (85 g versus 61.1g) than non PCOS healthy women.[25] Likewise, a higher amount of carbohydrates consumption has been reported in PCOS women in comparison to healthy women.[26] Correspondingly, previous findings highlight that dietary quality, in addition to quantity, is a critical determinant of metabolic and reproductive health in PCOS women.[27,28]

The present study's findings recorded no significant difference in carbohydrates and fat intake of non-obese and overweight/obese PCOS women, which may be a possible contributing factor to the furtherance of PCOS. Previous research also exhibited that women with PCOS are obese in body composition owing to increased tendency of overeating, predominantly sweets or starchy food.[29] A study conducted by Barr et al concluded that quality and quantity of fat intake and carbohydrates should be more focused while investigating the dietary nutrients.[25]

It is observed that high carbohydrate and fat intake can exacerbate insulin resistance and hyperandrogenism, thereby negatively influencing body composition and metabolic profile in women with PCOS.[10] A plethora of studies emphasized that diet modification with hypocaloric diet and low carbohydrate intake (<20 g/d) with increased physical activity (1200 kcal/d) leads to improvement in hyperandrogenism, menstrual frequency, insulin resistance and improved lipid profile in PCOS women.[30,31] In divergence to these findings, some reports addressed no notable significant variation in micro/macronutrients intake in women with and without PCOS.[26,20]

The present study revealed that intake of fibre in non-obese and overweight/obese POCS women differed slightly and have adequate amount of fibre when compared with RDA. This is might be associated with the dietary pattern of North Indian women, as they mostly consumed chappatis (Wheat bread) in their daily life. In convergence to our finding, Shishehgar et al also found no significant difference in fibre intake of PCOS and control women of Tehran.[32] Likewise, another study conducted by Douglas et al also found no significant differences of fibre intake among PCOS and healthy women.[26] However, the findings of Moran et al were in divergence to our study, where PCOS women exhibited significantly lower intake of fibre than control population.[33] The variability in the results may exist owing to the differences in nutritional choices or food habits according to their cultural setting. Finding of Leung et al indicated a possible association between lower dietary fiber intake with the metabolic as well as hormonal disturbances in PCOS.[34] In convergence to these findings, other studies highlighted the physiological contribution of dietary fiber through direct interaction with gut microbes, and enhance the production of key microbial metabolites favorable to the hosts.[35,36]

In current cross-sectional study LH was reported to be positively associated with level of fat intake in overweight/obese PCOS women. An earlier study revealed that low carbohydrates and ketogenic diet contributed to significant improvement of weight status, free testosterone, LH/FSH ratio and fasting insulin in PCOS women of North Carolina.[30] The study indicated that increased level of androgens in response to LH is contributed by hyperinsulinemia. In contrast to these findings, other studies referred that diet had no relationship with higher level of fasting insulin or lower glucose to insulin ratio as observed in PCOS women.[26] In previous research no notable significant correlation was found between the energy and macronutrient intake as well as hormonal and glucose metabolic variable in PCOS women.[37]

Our findings denoted that a positive and significant but weak association between free testosterone and calcium intake in overweight/obese PCOS women. In convergence to our findings, a study carried out by Pal et al illustrated an improvement of the androgen profile (FAI=13.72 versus 8.42) of overweight/obese American PCOS women with intervention of vitamin D and intake of calcium.[38] Although, findings of Krul-Poel et al highlighted a negative association between vitamin D level and metabolic disturbance in PCOS women from Netherland.[39] However, previous studies results were inconclusive in gauging the effect of vitamin D as a probable predictor of PCOS status.

The requirement of adequate calcium in PCOS women were essential as it correlated with egg maturation and normal follicular development in women.[39] The reduction in circulatory androgen concentration might justified the direct effect of calcium and vitamin D on the ovarian/adrenal steroid genesis pathway.[38] A study performed by Yildizhan et al depicted that serum 25-hydroxyvitamin D deficiency may be responsible for the alterations in intracellular calcium concentrations, resulting in ovulation and reproductive disturbances in women having PCOS.[40]

Strengths

This study examined the macronutrients and micronutrients of overweight/obese and non-obese PCOS cohort group in depth. Our study contributes to the existing body of knowledge by generating a database that may support and guide future research endeavors and for comparison in this realm.

Limitations

A few limitations of this research include the non-availability of control group due to financial restrains. Another limitation was that it was cross-sectional study, so definite effect of diet on body composition and hormonal feature might be better envisioned with longitudinal studies. Irrespective of all these factor, present study provides insights of dietary intake of PCOS women and its correlation with body composition and hormonal parameters.

CONCLUSION

Our study depicted that overall intake of micro-nutrients was inadequate in non-obese and obese PCOS women as compared to RDA, but higher intake of carbohydrate and fat was noted. Higher Carbohydrate and fat intake might be responsible to disturb the hormonal level and biochemical parameters in PCOS women as present study demonstrated positive association of luteinising hormone with fat intake, which is linked with polycystic ovary syndrome. Percentage visceral and total body fat were higher among overweight/obese women in comparison to non-obese women. Hence, appropriate dietary intake i.e., low fat intake should always be first-line strategy to control the upsurge of PCOS among women.

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