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The Relationship between the Symptoms of Polycystic Ovarian Syndrome and Dietary Pattern of Selected College Going Girls

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Abstract: ***Background: PCOS usually begins in adolescence, and it is difficult to predict whether the symptoms of the syndrome will self correct or persist into adulthood. (Kitzinger and Willmott, 2002), It has been proposed that women with PCOS might be at an increased risk of eating disorders given the propensity for obesity in PCOS(Geller et al, 2011).Objective: To carry out the dietary assessment of selected college going girls with and without the risk of PCOS. Materials and Methods: A Prospective observational design was adopted and the sampling method used in this study is a non-probability sampling technique. Study was conducted for the duration of three months, from November 2013 to February 2014 and 231 subjects were participate in this study. A questionnaire having the details of dietary pattern and food frequency was collected from study subjects. Results: 231 college going girls had a median age of 18.86± 1.4 years (ranging from 18 to 21 years) was selected for the study. Based on Rotterdam criteria and severity of the condition, 74 subjects (32 percent) were categorized as moderate risk subjects, among the total of 87 (37.6 percent) risk subjects whoexpected or predicted to have PCOS. Among the selected subjects majority 210 (90.9 percent) subjects were found to be non vegetarian. It was observed that, 71 (30.7 percent) subjects in the total and 27 (11.6 percent) subjects in the risk group have the habit of taking only one meal per day. Majority 117 (50.6 percent) subjects in the total and 39 (16.8 percent) in the risk group were used to skip their breakfast usually. Only 127 (55 percent) subjects and 49 (21 percent) subjects in the risk group have the habit of taking vegetables daily and 74 (32 percent) subjects in the total and 36 (15.5 percent) in the risk group have the habit of taking fruits daily. Inclusion of green leafy vegetables for past two months was found to be regular in 86 (37 percent) subjects in total and 17 (7.3 percent) in the risk group subjects. 47 (20.3 percent) subjects in the total and 16 (6.9 percent) in the risk group were including non vegetarian foods very frequently and only three subjects (1.3 percent) having the habit of taking soft drinks. Majority 119 (51.5 percent) subjects in the total and 53 (22.9 percent) subjects in the risk group were not having the habit of taking food outside and 41 subjects (17.7 percent) in the total and 12 (5.1 subjects) in the risk group have the habit of taking food outside very often. Among them majority of the subjects 120 (51.9 percent) subjects in the total and 44 (19 percent) subjects in the risk group were preferred to have deep fried foods. Majority 135 (58.4 percent) subjects in the total and 50 (21.6 percent) subjects in the risk group were preferred to have Sweets or Chocolates maximum time. Conclusion: In this study, 74 subjects (32 percent) were not only becategorised as moderate risk of PCOS, they were also expected to do modifications in their dietary pattern along with medications, which helps in relieving the presenting symptoms without any adverse side-effects. However, follow-ups for three to six months were needed to evaluate the effect of dietary management over the symptoms of identified PCOS risk subjects.***

Keywords: PCOS,Rotterdam criteria, Food frequency, Soft drinksDietary management

1. Introduction

PCOS is extremely prevalent and is estimated to be present in 5–7 Percent of reproductive-age women if we consider the diagnosis to be based on hyperandrogenism and anovulation (**Carmina, 1999).** PCOS usually begins in adolescence, and it is difficult to predict whether the symptoms of the syndrome will self correct or persist into adulthood. Hirsutism, menstrual irregularity and infertility have been shown to be the most distressing symptoms in adults with PCOS **(Kitzinger and Willmott, 2002),** whereas weight difficulties have been identified as the most distressing symptom in adolescents and young women with PCOS **(Trent et al., 2002, 2003, 2005).**Up to 50 percent of women affected with PCOS are obese, a condition that has been found to increase the magnitude of underlying insulin resistance **(Geller et al, 2011).** It has been proposed that women with PCOS might be at an increased risk of eating disorders given the propensity for obesity in PCOS.

2. Methodology

A Prospective observational design was adopted and the sampling method used in this study is a non-probability sampling technique. 231 adolescent girls and young adult women were took part in the study and the girls who volunteered to participate were asked to fill up a questionnaire asking about the details of their meal pattern and dietary habits.

3. Results

The final sample of 231 college going girls had a median age of 18.86± 1.4 years (ranging from 18 to 21 years) was selected for the study. Among the total study group, based on Rotterdam criteria and severity of the condition, 74 subjects (32 percent) were categorised as moderate risk subjects, among the total of 87 (37.6 percent) risk subjects whoexpected or predicted to have PCOS.

Among the selected subjects majority 210 (90.9 percent) subjects were found to be non vegetarian, in that 81 (35 percent) subjects were in risk group and remaining 21 (9.1 percent) on the whole and only six (2.59 percent) subjects in risk group were found to be vegetarian. It was absorbed that (p=0.256 NS) no significance was found between risk group and normal subjects. A study shows that, an experimental vegetarian diet with low calorie was reported to induce menstrual cycle disorders, showing a short luteal phase. **Pirke KM *et al*, (1986).**

Majority of the subjects, 104 (45 percent) subjects in the total and particularly 35 (15 percent) subjects in risk group were taking all the three meals daily. 71 (30.7 percent) subjects in the total and 27 (11.6 percent) subjects in the risk group have the habit of taking only one meal per day. 50 (21.6 percent) subjects in the total and 23 (9.9 percent) subjects in the risk group have the habit of taking two meals per day. Six (2.6 percent) subjects in the total and particularly two (0.86 percent) subjects in the risk group have the habit of taking five small frequent meals per day. It was absorbed that (p=0.534 NS) no significance was found between risk group and normal subjects.

It was also found that, in the past two months, majority 117 (50.6 percent) subjects in the total and 39 (16.8 percent) in the risk group were used to skip their breakfast usually. It was absorbed that (p=0.125 NS) no significance was found between risk group and normal subjects.

Children who skipped breakfast had higher daily percentage of energy from fat and lower intakes of energy, protein, vitamins, and minerals. It has been widely assumed that skipping breakfast may lead to excessive weight gains **Nicklas TA, Reger C, Myers L, O'Neil C (2000)**

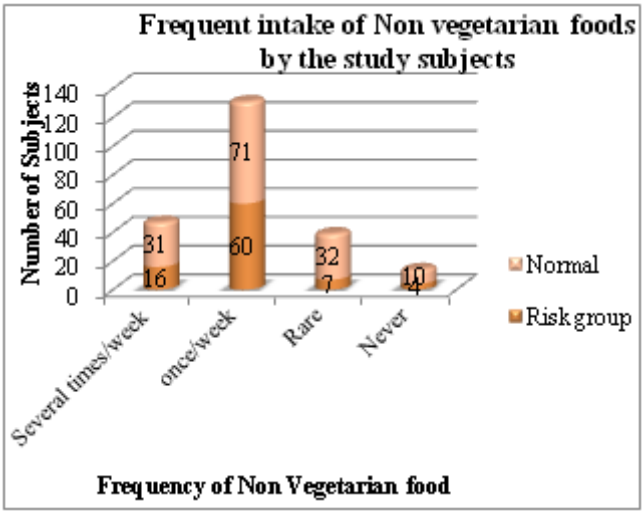
Fujiwara T (2003) recently found that young women who skip breakfast have a significantly higher degree of dysmenorrhea symptoms than young women who eat breakfast, suggesting a positive correlation between skipping breakfast and menstrual disorder.,

Table 1: Daily Inclusion of Food Groups by Selected Subjects

Food groups	N = 231	Percent (%)	n = 87	Percent (%)	p value
Vegetables	127	55	49	21	0.428^{NS}
Fruits	74	32	36	15.5	0.014^{NS}
Green leafy vegetables	86	37	17	7.3	0.599^{NS}

From the above table, it was found that, in the total 231 subjects only 127 (55 percent) subjects and 49 (21 percent) subjects in the risk group have the habit of taking vegetables daily and 74 (32 percent) subjects in the total and 36 (15.5 percent) in the risk group have the habit of taking fruits daily. Remaining subjects were taking vegetables and fruits very rarely. Inclusion of green leafy vegetables for past two months was found to be regular in 86 (37 percent) subjects in total and 17 (7.3 percent) in the risk group subjects, respectively. It was absorbed that (p=0.428,0.014, 0.599NS) no significance was found between risk group and normal subjects.

High fibre diet reduces serum oestrogen concentrations in pre-menopausal women **(Rose *et a l*, 1991)** and it is supposed that a low fibre-high lipid diet may also increase oestrogen and androgen pools



From the above figure it was clear that, majority 131 (56.7 percent) subjects in the total and 60 (26.4 percent) in the risk group were taking non vegetarian foods once in a week. Whereas 47 (20.3 percent) subjects in the total and 16 (6.9 percent) in the risk group were including non vegetarian foods very frequently. The consumption of vegetarian food along with a regular exercise program helps in lower cholesterol levels, lower blood pressure, less obesity, lesser incidence of diabetes and so less heart disease. And the Non-vegetarian food has an adverse impact on our cholesterol levels and increases the incidence of heart diseases. But in India most of them are consuming non-vegetarian diets **(Sienkiewicz F et al, 2008).**

Among the total subjects, majority 209 (90.5 percent) subjects in the total and 79 (34 percent)in the risk group having the habit of taking milk daily, 18 (7.8 percent) in total and five (2.1 percent) subjects in risk group having the habit of taking tea/coffee, only three subjects (1.3 percent) having the habit of taking soft drinks. It was also absorbed that none of the subjects have the habit of taking fresh fruit juices. It was absorbed that (p=0.287 NS) no significance was found between risk group and normal subjects.

Adolescents who ate less cereal and milk had higher percentage of body fat **Liang K-Y, Zeger SL (1986)** Majority 119 (51.5 percent) subjects in the total and 53 (22.9 percent) subjects in the risk group were not having the habit of taking food outside. 49 subjects (21.2 percent) in total 15 (6.4 percent) in the risk have the habit of taking food once in a week. Whereas 41 subjects (17.7 percent) in the total and 12 (5.1 subjects) in the risk group have the habit of taking food outside very often. It was absorbed that (p= 0.88 NS) no significance was found between risk group and normal subjects.

Among them majority of the subjects 120 (51.9 percent) subjects in the total and 44 (19 percent) subjects in the risk group were preferred to have deep fried foods, whereas 111 (48.1 percent) subjects in the total and 43 (18.6 percent)

were have the habit of taking boiled foods. It was absorbed that (p=0.425 NS) no significance was found between risk group and normal subjects.

In women who have diets with high in fiber, low in fat, or both, concentrations of ovarian hormones or their metabolites were shown to be lower at various points in the menstrual cycle. **Bagga D, (1995).** Consumption of snacks that were higher in fat will increase plasma total cholesterol levels **Resnicow K, (1991).**

In the total study subjects, majority of the subjects 135 (58.4 percent) subjects in the total and 50 (21.6 percent) subjects in the risk group were prefer to have Sweets or Chocolates maximum time. 72 subjects (31.2 percent) in the total and 29 (12.5 percent) subjects in the risk group were used to take biscuits usually. 22 (9.5 percent) and six (2.5 percent) subjects were have the habit of taking Pizza or burger often. It was absorbed that (p=0.158 NS) no significance was found between risk group and normal subjects.

4. Conclusion

Dietary modification and increased physical activity are the cornerstones to successful PCOS risk reduction. In this study, 74 subjects (32 percent) were not only be categorised as moderate risk of PCOS, they were also expected to do modifications in their dietary pattern (increased inclusion of vegetables, greens, fruits, milk products and pulses, also moderate inclusion of non vegetarian foods and restricted inclusion of fried items, sweets and junk foods) along with medications, which helps in relieving the presenting symptoms (Hirsutism, irregular menses, etc.) without any adverse side-effects. However, follow-ups for three to six months were needed to evaluate the effect of dietary management over the symptoms of identified PCOS risk subjects.

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