Assesment of Nutritional Status of PCOS Patients

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Abstract: Polycystic ovarian syndrome (PCOS) is one of the most common reproductive endocrinological disorders with a broad spectrum of clinical manifestations affecting about 6-8% of women of reproductive years.Modest weight loss (5%–10% of initial body weight) can improve nearly all abnormal reproductive, metabolic, hormonal, lipid profile, and psychological parameters in women with PCOS.With regard to diet, clearly any diet that results in weight loss will be beneficial to a woman with PCOS, but given the likelihood of insulin resistance, one could speculate that low-carbohydrate and/or low-glycaemic index diets may be especially effective.So the present study was carried out to**"Assessment of Nutritional Status of PCOS Patients".**For this study sixty PCOS patients in the age group of 18-30 years were selected from Thrissur district by purposive sampling method. Interview schedule was used to collect the data on socio demographic, lifestyle pattern, medical history, anthropometric, biochemical and dietary variables of the subjects. Results showed that 15 per cent of the subjects were Obese and 3 per cent were underweight whereas the remaining were normal.Majority of them had normal biochemical parameters. Nutrient intake was compared with ICMR Recommended Dietary Allowances (RDA).The intake of all food items and nutrients were estimated. The energy intake was almost near to RDA while inadequate intake of carbohydrate and iron were observed.

I   Introduction

PCOS is a major health concern because patients with PCOS are at increased risk of infertility, pregnancy loss, obesity, cardiovascular disorders, diabetes mellitus, obstructive sleep apnea, depression, non-alcoholic fatty liver disease, endometrial hyperplasia and endometrial carcinoma, etc.The exact cause of PCOS is not known. Higher than normal androgen levels in women can prevent the ovaries from releasing an egg (ovulation) during each menstrual cycle, and can cause extra hair growth and acne.Many women with PCOS have insulin resistance; especially those who are overweight or obese, have unhealthy eating habits, do not get enough physical activity, and have a family history of diabetes (usually type 2 diabetes). Over time, insulin resistance can lead to type 2 diabetes.

Young women with PCOS are often most concerned with fertility. But PCOS is also associated with conditions that can affect a woman's health well beyond the reproductive years. Many obese women with PCOS have features of metabolic syndrome (MBS) which increases the risk for coronary heart disease. The elements of MBS are high blood pressure, elevated fasting glucose, abdominal obesity, low HDL ("good cholesterol") and elevated triglycerides. Weight loss and exercise can help reduce MBS and maintain cardiovascular health.

Modest weight loss (5%–10% of initial body weight) can improve nearly all abnormal reproductive, metabolic, hormonal, lipid profile, and psychological parameters in women with PCOS. Furthermore, exercise interventions improve insulin resistance and restore menstrual cycles regardless of weight change, suggesting that many aspects of a lifestyle intervention can improve outcomes.

Indeed, studies have demonstrated that low carbohydrate diets and/or low-glycaemic diets among overweight/obese PCOS women result in significant reductions in body weight, fat mass, free testosterone, LH/FSH ratio, free androgen index, and insulin resistance; and improvements in lipid profile and menstrual cyclicity compared with relatively higher carbohydrate diets.

In some cases, improvements in metabolic and clinical outcomes occurred independently of weight loss.It is important to recognize that improved abdominal obesity and insulin sensitivity may occur without an overall change in body weight. In particular, body composition of patients who exercise regularly may change with increased lean body mass and decreased fat mass, but no overall change in weight. Increased lean body mass (muscle) increases resting energy expenditure and may help improve hormonal and metabolic parameters in women with PCOS. While the benefits of modest weight loss have become more widely appreciated in recent years, this should not preclude us from aiming for as near normal body weight and composition as possible where this is feasible. To that end, our range of dietary options is increasing. For example, short term meal substitution to achieve calorie deficit is now recognized as an option for women with PCOS (Moran et al.,

2006).All these facts points out the need for "**Assessment of Nutritional Status of PCOS Patients"**. With the above facts in mind, the investigator conducted the present study with the following objectives,

• To assess socio-economic status of the subjects
• To assess lifestyle pattern of the subjects
• To assess nutritional status of the subjects

II   Methodology

A recent study conducted in 10 schools among students aged 15 to 18 years in Trivandrum city found that 13.56% of the girls had menstrual dysfunction and the rate of detection of PCOS among these was 72.3%. The estimated prevalence of PCOS among these adolescent girls was 9.8%.Therefore, sixty PCOS patientsaged between 18-30 years were selected by purposive sampling method from Thrissur district during 2016-2017.Purposive sampling is generally considered most appropriate for the selection of small samples often from a restricted population (Paul, 2008).Data pertaining to the present study (socio economic status, personal characteristics, obstetric details and nutritional status) was collected by interview method.Anuja (2001) suggested that interview schedule is an effective exploratory device for identifying new variables and for shapening of conceptual clarity. A Pilot study was conducted to check the effectiveness of tool. For this, tools were administered to a micro sample of size 10 and accordingly necessary changes were made to make it effective and meaningful.

According to Mcguire and Beerman (2012) nutritional assessment methods can provide some information about nutritional status and it includes anthropometric measurements, biochemical measurement, clinical assessment and dietary assessment. Anthropometric measurements were determined through height, weight and Body Mass Index.Biochemical assessment was conducted in the PCOS patients for assessing the general health and nutritional status by determining their serum cholesterol, TSH, RBS, prolactin and hemoglobin.Dietary assessment was done with food habits, food frequency list and 24 hour recall of the subjects. From these data the actual nutrient intake was calculated and compared with the RDA. Percentage analysis and appropriate inferential statistical measures were utilized for analyzing the data.All data analysis was carried out using the statistical software SPSS (22 ver.). Mean, Median, Mode and Percentage analysis were used. Charts and tables were drawn in MS Excel. Chi-square, Independent Sample Mann-Whitney U Test and Karl Pearson correlation coefficient was used to find out the relation between various variables. For all statistical tests P value of less 0.05 was taken as statistically significance.

III   Results & Discussion

1. Socio economic status of the subjects

Socio economic status of the families revealed that the incidence rates had higher among Islam (46.7%)followed byHinduism (30 %) and Christianity (23.3%). In a study on the clinical, biochemical and hormonal profile of polycystic ovary syndrome patients attending tertiary care hospital by Spandana et al.(2015), the prevalence of PCOS in Hindus were 71 per cent in a cross sectional study of 100 PCOS patients. The prevalence of PCOS in our study was seen majorly in the age group of 22-26years (41.7 per cent) which are young women. In the present study majority of the samples lived in a joint family surrounding (71.7 per cent) with a family household size consisting of 5-8 members.Literacy rate in Kerala has seen upward trend and is 94.00 per cent as per 2011 population census. Of that, female literacy is at 92.07 per cent. In the study 73 per cent of the subjects were graduates and 25 per cent were 12th grade qualified.On the basis of monthly income all the families were earning from 18000-36016 Rupees.

2. Life style pattern of the subjects

Life style pattern of the subjects were studied with respect to their personal habits.Out of 60 samples , 96 per cent of them slept for 4-6 hours, 4 per cent of the subjects slept for < 4 hours.Randeva et al.(2002) showed that exercise, such as regular walking, reduces waist-to-hip ratio, an indicator of diabetes and other morbidities, and homocysteine levels, an indicator of cardiovascular risk, in overweight PCOS women.The present study observed that, 53 per cent were doing exercise ,out of these 32 subjects, 94 per cent practices Yoga as a form of physical activity and 6 per cent has a routine of engaging in Brisk walking.

3. Disease details of the subjects.

Medical history of the subjects showed that 3 (5 %) had Diabetes Mellitus and 6 (10 %) were Anemic.A study by Ehrmann et al. (2004) on the prevalence of Glucose intolerance of PCOS patient showed that 2 (4.3%) women had Diabetes Mellitus whose basal glucose values were compatible with impaired fasting glucose.

4.Menstrual Details of the subjects.
It was revealed that the age of menarche for majority of the subjects (93 %) were at the range of 13-15 years. Only two per cent of the subjects had regularity in their menstrual cycle. Similarly in the present study 58 per cent of the subjects menstrual duration was less than three days. Twenty seven cases faced the problem of stomach pain during menstruation. They suffered from many problems like headache, vomiting, back pain and abdominal cramp.

5. Obstetric Details of the subjects.
Irudaya and Zachariah (2001) found that in Kerala, most females get married when they are in the age group of 20-24 years.However, based on the Obstetric details it was observed that majority of the subjects (70%) got married at the age of 21-22 and had their first pregnancy at the same age range. Whereas out of this 42 married subjects (72%) had null parity.

6. Physical Appearance of the subjects
        Physical presentations of polycystic ovarian syndrome include abnormal facial and skin hair growth (hirsutism), acne, and irregular or absence of menstrual periods.In the present study Hirsutism or excessive hair in skin were found in 23 per cent of the subjects. Although 67 per cent of the subjects had good physical appearance, seventeen per cent of them had pale eyes.

7. Present Medical Status of the subjects
Vasomotor symptoms are usually described as night sweats, hot flashes, and flushes. However in the present study it is seen that 44 per cent of the subjects experienced night sweats and 56 per cent had palpitation.

8. Anthropometric Measurements of the Subjects
Venkaiah*et al.* (2002) found the average height of an Indian woman is 1.521 meter (4 ft 12 inch). In the current study it was found that the average height of female subject was 155 cm and the weight was 60 kg.Taponen*et al.* (2003) said that , obesity in adolescent and in adulthood and also weight gain after adolescent, particularly in the presence of abdominal obesity are associated with self-reported PCOS symptoms in adulthood. In the present study, 15 per cent (9) were Obese and 3 per cent (2) were seen to be Underweight.

Figure 1: Body Mass Index of the Subject
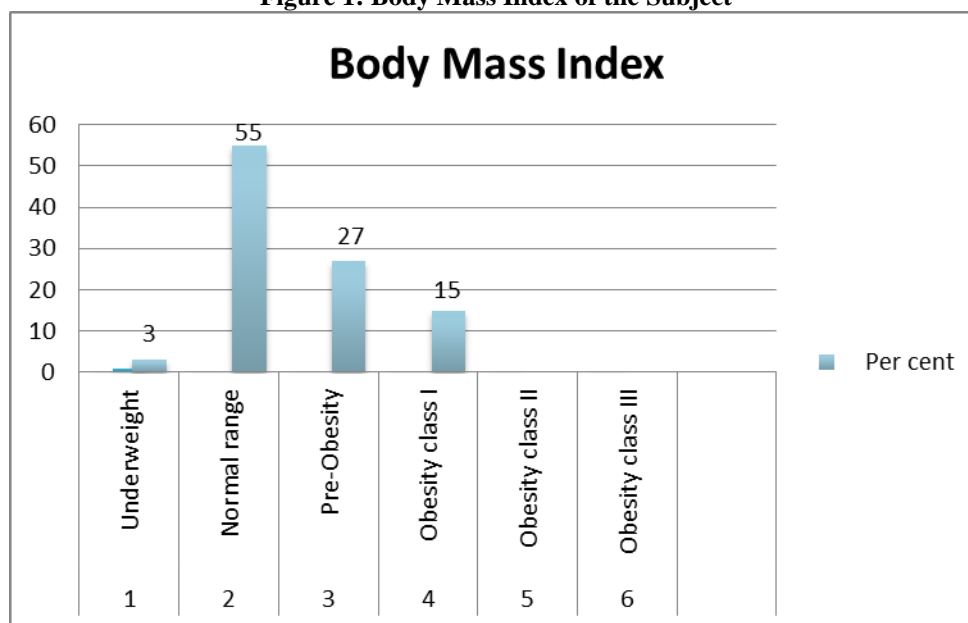
9. Biochemical Analysis of the subjects
        In the present study ,70 per cent of the subjects had normal cholesterol levels. Majority (85%) of the subjects had a normal TSH value whereas Haemoglobin levels were low for 10 per cent of the samples. Five per cent of the samples had abnormal blood glucose levels whereas, Prolactin levels and blood pressure of all 60 subjects were normal.

10. Food Consumption Pattern of the subjects
      Food consumption pattern of the subjects were studied with respect to their food habits, frequency of use of food items and food and nutrient intake of the subjects.

10.1 Dietary Habits of the subjects
In a Study by Sunanda*et al.*(2016) to Assess the Knowledge Regarding PCOS (Poly cystic Ovarian Syndrome) among 150 Nursing Students at NUINS, it was found that 13% of the subjects were Non-vegetarians. Details regarding the dietary pattern of the PCOS subjects showed that 98.4 per cent of them were non vegetarians, 25 per cent of the subjects skipped meals and the meal skipped was Breakfast and 15 per cent of them skipped due to dislike to eat in the morning.

10.2 Frequency of use of different food items by the subjects
      From the survey it was evident that Cereals, milk and milk products, fats and oils and sugar were most frequently used food items, while foods like Pulses, other vegetables, fruits, roots and tubers, meat fish and egg were moderately used foods whereas green leafy vegetables were used less frequently.

Figure 2: Classification of food items based on food use frequency score
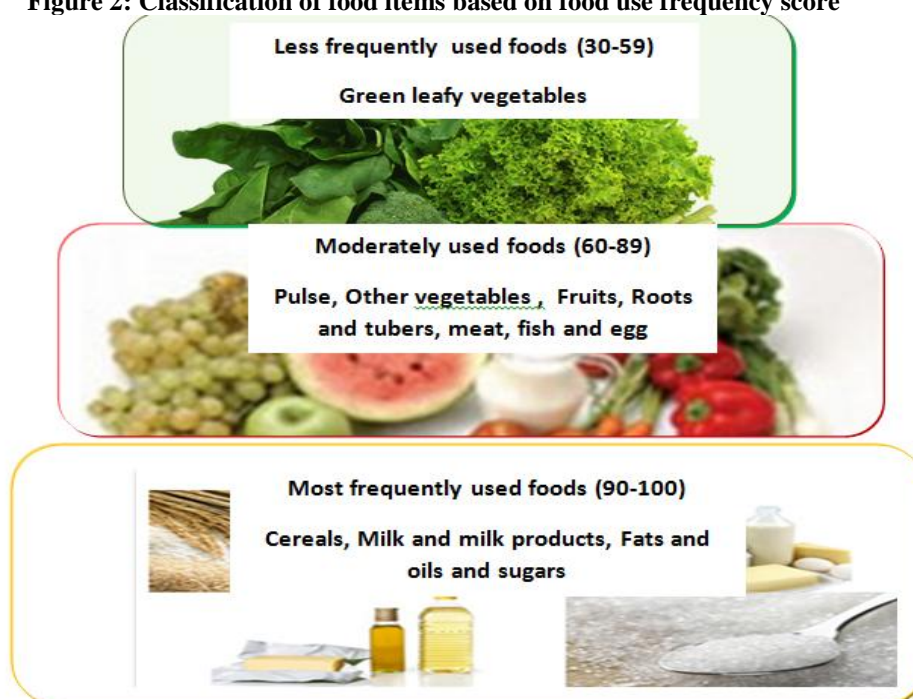
10.3 Food and Nutrient intake of the subjects

Table 3: Mean food intake of the subjects

Food groups	❖ RDI of sedentary Woman (g)		Per cent of RDI met
	RDI	Mean food intake	Per cent(%)
Cereals	270	225	84
Pulses	30	24	78.33
Greenleafy vegetables	100	13	13
Other vegetables	200	29	15
Roots and tubers	200	90	45
Fruits	100	55	55
Milk& milk products	300	261	87
Meat/Egg/fish	30	26	87
Fats and oils(visible)	20	20	100
Sugar	20	14.2	71.25

❖   **NIN (2011)**
      The food intakes of the respondents were measured by 24 hour recall method in order to assess the food quantity and quality of nutrients present in their diet.An adequate diet or balanced diet which provides all essential nutrients in sufficient quantities is essential to meet the needs of the body. It was revealed that the diet

consumed by the subjects was not a balanced one. It is evident that the intake of cereals, pulses ,milk and milk products, meats, fats and sugars were satisfactorily meeting the RDI. On the other hand intake of green leafy vegetables, roots and tubers, other vegetables and fruits were very poorly met. Lack of adequate consumption of vegetables and fruits leads to micronutrient deficiencies leading to debilitating vitamin and mineral deficiency disorders in PCOS patients.

Data from the survey showed that energy intake was only satisfactory level in the PCOS subjects and subsequently there has been a small decline in carbohydrate and iron intake.The fat and protein intake was meeting the RDA.Iron was found to be very less which may be due to low intake of green leafy vegetables and other iron sources.

IV   Summary And Conclusion

From this investigation it can be concluded that PCOS patients experienced few problems such as lack of adequate food and nutrient intake and   altered biochemical parameters like decreased Hemoglobin. Consequently, these patients are at risk of malnutrition that can lead to debilitating lifestyle disorders that may lead to chronic diseases.

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