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### RESEARCH ARTICLE

#### ROLE OF DIET IN THE MANAGEMENT OF POLYCYSTIC OVARIAN SYNDROME (PCOS).

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#### Abstract

Polycystic Ovarian Syndrome (PCOS) is heterogeneous, multisystem with Ovarian endocrinopathy in woman of reproductive age with ovarian expression of various metabolic disturbances. The prevalence of PCOS in general population has been estimated to be 5 – 10%. The classical presentation is characterized by features of anovulation, amenorrhea, oligomenorrhea or irregular cycles in combination with signs of androgen excess, acne, hirsutism or alopecia. It is associated frequently with insulin resistance. It is the commonest cause of infertility due to anovulation. PCOD affects 5 – 10%. Of reproductive age woman rising till 15% in woman with infertility. In this paper we will discuss the role of diet in the management of PCOS.

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#### Introduction:-

Current incidence of PCOS (5 – 10%) is fast increasing lately due to change in life style and stress. It is also becoming a common problem amongst adolescent developing soon after puberty. Amongst infertile woman 20% of anovulation is caused by PCOS. Some of the woman who develop cardiovascular disease, hypertension, endometrial cancer and type 2 diabetes later in life appear to have suffered from PCOS in earlier years.

PCOS has been attributed to several causes including changes in lifestyle, diet and stress. Genetic and familial environment factors were added as aetiological factor in development of PCOS.

Approximately 50% patients are hirsute and 30-75% are obese. Presumptive diagnosis of PCOS can often be made based of history and initial examination. According to an international consensus group, the syndrome can be diagnosed if at least 2 of following condition is present :-

1. Oligomenorrhea Or Amenorrhea
2. Hyperandrogenism and
3. Polycystic ovaries on ultrasound

PCOS is presumably related to hypothalamic pituitary dysfunction and insulin resistance. The clinical features of PCOD are menstrual irregularities, signs of androgen excess and obesity. It can give rise to long term complication like infertility, cardiovascular ailments, type 2 diabetes and carcinoma of breast and endometrium.

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Weight loss is key in decreasing insulin resistance in obese woman. It shows that lower glycaemic diet may play important role in helping to control insulin and promote weight loss.

### **Dieto therapy in PCOS**

PCOS patients are not always markedly overweight but PCOS is strongly associated with abdominal obesity & insulin resistance. Effective approaches to nutrition & exercise improve endocrine feature reproductive function & cardio metabolic risk profile even without marked weight loss. Recent studies allow us to make recommendations on macronutrient intake. Fat should be restricted to or <or =30% of total calories with a low proportion of saturated fat.

High intake of low GI carbohydrate contributes to dyslipidemia & weight gain and also stimulates hunger and carbohydrate craving. Diet & exercise need to be tailored to the individuals need & preferences calorie intake should be distributed between several meals per day with low intake from snacks and drinks. Use of drugs to either improve insulin sensitivity or to promote weight loss are justified as a short term measure, and are most likely to be beneficial when used early in combination with diet & exercise.

Weight loss, accompanied by an increase in insulin sensitivity has proven to be successful treatment for the metabolic and hormonal abnormalities characteristics of PCOS population.

Until recently diet was not brought of as an important adjunct in treatment. However since the fairly recent discovery regarding the role of insulin resistance plays many experts believe that diet should be part of treatment plan.

It is believed that diet can help reduce insulin resistance cure which help to regularise menses, hersuitism & acne and also decrease the risk of heart disease and diabetes as well.

### **Role of diet in PCOS**

dietary recommendation of PCOS

1. Do not eat carbohydrate alone .Combine with protein & fat.
2. Do not take carbohydrate level so low that it can causes ketosis .Eating less than 40gm of carbohydrate causes ketosis.
3. Eat lower glycemic index food as they cause low rise in blood sugar (Glycemic index is an indicator of how rapidly the food turns to sugar in blood). Select bread, grain & cereals which are unprocessed.

Space the carbohydrates out during day. This causes less of rise in blood sugar and insulin peak as compare to eating all carbohydrate at one meal.

1. Calcium 1000mg – 1500mg/ day is advised.
2. Multivitamin with minerals to be taken

### **Drink at least 10 –**

12 glass of water, limit food high in saturated & trans fat. Select mono unsaturated fats & omega 3 fat. exercise

### **PCOS diet tip**

#### **More fibre :-**

To combat the symptoms of PCOS and reduce insulin levels. High fibre diet can help combat insulin resistance by slowing digestion and reducing the impact of sugar in the blood.

Recommended foods are cruelfarous vegatable such as broccoli cauliflower and sprouts, green including red leaf celluce, green & red peppers, beans, lentils, almond, beans, sweet potatoes, pumpkin.

#### **Eat more lean protein : -**

Protein keeps you full longer, so you're less likely to reach for unhealthy snacks. Less protein such as to you, chicken and fish don't provide fibre but are very filling and healthy dietary option for woman with PCOS. Fish are also great source of protein . Egg yolk provides omega 3 fatty acid, iron, folate and vit A, D, E, K.

Eat food that reduce inflammation. Tomatoes, Spinach, Almond, Walnuts, Olive oil, fruits, fatty fish high in omega 3 fatty acid & whole grains.

### **Green Leafy Vegetables**

Leafy vegetables have maximum nutrients per calories compared to other foods and also rich in calcium, iron, potassium, magnesium along with vitamins K, C and E and most importantly essential B vitamins which plays an imperative role in managing the symptoms of PCOS. B vitamins – especially B2, B3, B5 and B6 help in better sugar and fat metabolism, improve thyroid functioning and render better hormone balance, improve fertility all of which are essential for PCOS management.



The minerals help to neutralize the acidity caused by inflammation and impaired glucose tolerance. Calcium helps in egg maturation and follicle development in ovaries; potassium is needed for FSH (Follicle Stimulation Hormone) production. It helps to reduce PMS symptoms and also promotes weight loss.

### **Coloured Vegetables**

Brightly colored vegetables not only makes for an appetizing salad but also helps in controlling PCOS and must be included in the PCOS diet plan. Colourful vegetables are loaded with powerful antioxidants that help to neutralize the harmful effects of oxidative stress in women suffering from PCOS.



Some of the healthiest colored vegetables include red and yellow bell peppers, sweet potatoes, tomatoes, carrots, eggplant, etc.

### **Fruits**

This is the next set of healthy foods that must be included in PCOS diet recipes. Although most women suffering from PCOS are reluctant to include fruits in their diet because of the fructose content that causes a sudden spike in blood sugar levels and consequently insulin levels, fruits are really rich in phytonutrients, vitamins, minerals and fibres so it should not be avoided entirely.



Include fruits that have low GI such as lime, strawberries, apricot, grapefruit, lemon, cantaloupe, guava, pear, oranges, watermelon, blueberries, nectarines, apples and kiwifruit and also eat a handful of nuts or seeds with the fruits for the much needed protein boost that helps to control the sudden sugar spike caused by fruits.

### Healthy Fats

Not all fats are unhealthy and harmful for women suffering from PCOS. Healthy fats and essential fatty acids are indispensable for maintaining the cells and removing toxins from the body as well as promoting hormonal balance and weight management. Healthy fats also hold an important place in PCOS fertility diet. Healthy fats are found in seeds, nuts, avocado, olive oil and oily fishes like tuna and salmon.



Salmon is an amazing source of healthy fats and vitamin D that helps relieve certain problems related to PCOS. Tuna is rich in B vitamins and vitamin D both of which are essential for women with PCOS.

### Organic Meat

Because weight gain is a major issue related to PCOS, it is important to include lean proteins in a PCOS weight loss diet in order to control body weight.



Meat is one of the powerful **natural sources of protein.**

### **Low GI Carbohydrates**

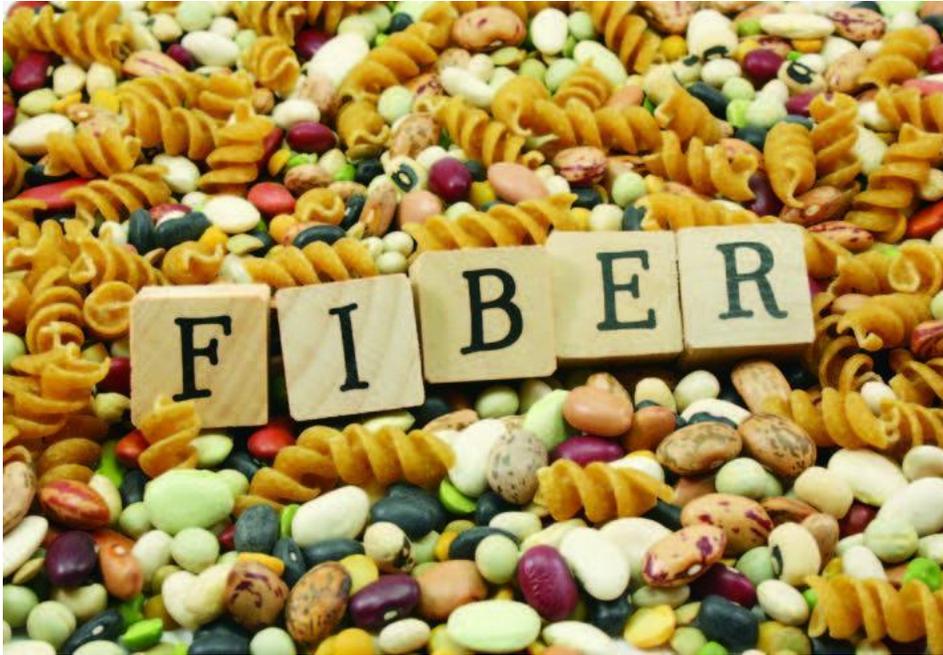
It is not necessary to completely shun carbohydrates even if you have PCOS, you just need to choose the carbohydrates judiciously. Carbohydrates with high Glycemic Index such as instant breakfast cereals, white breads, white bagels and white rice cause fast rise and blood sugar levels which in turn increase the release of insulin from the pancreas in order to use the glucose for energy, but high levels of insulin in the body eventually leads to insulin resistance and obesity which worsens PCOS symptoms.



Therefore, it is suggested to opt for healthy carbohydrates with low Glycemic Index that takes longer to break down and digest, causing slow and consistent release of blood glucose in the body. Low GI foods also aid to keep you satiated for longer and prevent cravings. Most legumes, beans, and lentils and non-starchy vegetables have low GI rating.

### **Conclusion:-**

1. Although there is no known cure for PCOS yet, following a few simple guidelines and bringing about a few changes in the lifestyle can help a lot in managing PCOS symptoms naturally.
2. Consume whole grains instead of processed and refined foods and whole fruits instead of fruit juices in order to maintain blood glucose and insulin levels.
3. Eating foods rich in fiber also lead to a slower, consistent and controlled rise in blood sugar and insulin levels.



- 4.
5. Some healthy fiber rich foods are legumes and vegetables that also provide necessary nutrients for the body.
6. Combine proteins and carbohydrates together because proteins help to regulate the blood glucose spike caused by carbohydrates consumption.
7. Eat regularly but not too frequently. Divide your foods into 3 to 4 meals and eat them every 4 to 5 hours in order to improve insulin sensitivity and prevent cravings for unhealthy snacks. Also, never ever skip breakfast.
8. Limit salt intake to less than 2400 milligrams per day. Use other seasonings such as lemon juice, vinegar, pepper, herbs, mustard and spices instead.
9. Limit the intake of processed foods such as cured meats, smoked meats, salted nuts, canned vegetables, sauces, chips and marinades.
10. Give up regular cooking oil and choose unsaturated oils such as olive oil and corn oil.
11. Snack on healthy nuts and seeds such as almonds, walnuts, pecans, sunflower seeds and flax seeds that are rich in monounsaturated and polyunsaturated fats.
12. Eat 2 to 3 servings of fish every week in order to load up on essential fatty acids that are beneficial for controlling PCOS symptoms.
13. Choose healthy cooking options such as baking, grilling, broiling, boiling and steaming instead of deep frying.
14. Eat protein with every meal because proteins have a stabilizing effect on sugar that is released by the carbohydrates.
15. Avoid sugar in all forms – refined sugar, high fructose corn syrup and even artificial sweeteners.
16. Drink 2 litres of water every day. You can add some tasty twist to your water by adding fresh cucumber, mint, berries or lemons to it.
17. In order to promote healthy weight loss of 1 pound per week you can reduce 500 calories from your present maintenance calorie level and in order to reduce 2 pounds per week reduce 1000 calories from your daily maintenance calorie level.
18. Women with PCOS are at much higher risk of heart diseases and diabetes, so it is best not to aggravate the risk further by smoking.
19. Have enough sleep every night because a lack of sleep can affect hormones and worsen the symptoms and problems.
20. Stay physically active and make exercise a part of your healthy lifestyle. Just like diet, exercise also plays a vital role in improving PCOS symptoms because it is a great way to enhance insulin sensitivity and restore the balance of the reproductive hormones. In addition, exercises also help in weight management and promoting weight loss. A combination of aerobic exercises for 30 minutes.

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