



## Effects Of Pcos And It's Preventive Measures : A Review

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Article History	Abstract
Received: Revised: Accepted:	PCOS is an endocrine disorder affecting women of reproductive age, every 1 in 5 women is suffering from PCOS. The main issue related to PCOS is hormonal imbalance which leads to many symptoms like Hair loss, weight gain, insulin resistance, hirsutism, pelvic pain, acne, irregular periods, High testosterone level, infertility, and in extreme cases cancer and heart disease. The exact aetiology of PCOS is not known and it may be multifactorial. Many researchers said it can be due to ovarian abnormalities, genetics as it can run in families, some chemical or genetic changes, and environmental factors. In some cases, hyperinsulinemia, obesity, stress, processed food, energy drinks, alcohol, smoking, etc. lead to PCOS. According to body type, symptoms, age, and other factors, treatment vary among different women. Many complications are associated with PCOS like miscarriage, preeclampsia, gestational diabetes, premature delivery, metabolic syndrome, etc. Many different kinds of eating habits can worsen the effect of PCOS like caffeinated drinks, red meat, processed food, fried foods, dairy products, sugary drinks, alcohol, processed meat, soy, baked foods, etc. One should eat high-fibrous food, foods rich in protein and good fats. Lifestyle plays a very vital role in PCOS a proper 7-8hr sound sleep, physical activities, aerobic exercise, yoga, meditation, healthy diet are very important factors that can suppress or cure PCOS.
CC License CC-BY-NC-SA 4.0	<b>Keywords:</b> <i>PCOS, Endocrine disorder, Hyperinsulinemia, Miscarriage, Preeclampsia, Gestational diabetes, Metabolic syndrome</i>

### 1. Introduction:

Polycystic ovary syndrome (PCOS) is a hormonal disorder common among women of reproductive age. It causes irregular and prolonged menstruation and increased levels of male (Androgen) Hormone. FSH stimulates the ovary to produce a follicle, while LH triggers the ovary to release a mature egg. PCOS is a "syndrome" that affects the ovaries and ovulation.<sup>[1]</sup> Polycystic ovary syndrome (PCOS) is a condition that affects 5-10% of women of reproductive age, with symptoms such as facial hair, obesity, mood swings, depression, acne, hair loss, difficulty in getting pregnant, and in extreme cases Cancer and Heart Disease. Studies have shown that depression is an inflammatory disorder marked with an increased level of inflammatory markers, which can cross the Blood Brain Barrier (BBB).

#### Pregnancy Complications Associated With PCOS

Women with polycystic ovary syndrome (PCOS) have higher chances of miscarriage due to a longer menstrual cycle, insulin resistance, gestational hypertension, preeclampsia, gestational diabetes, premature delivery, and

preeclampsia.<sup>[2]</sup> These conditions can lead to poor egg quality, uncontrolled blood sugar, gestational hypertension, preeclampsia, gestational diabetes, premature delivery, and preeclampsia.<sup>[2]</sup> Women with PCOS are at a higher risk of developing preeclampsia - or high blood pressure - during pregnancy, according to the American Pregnancy Association.<sup>[2]</sup> Women with PCOS are at a higher risk of developing preeclampsia - or high blood pressure - during pregnancy, according to the World Health Organization.<sup>[2]</sup>

Although there are no proven ways to control PCOS still we can control it through our lifestyle and nutritional diet. Women with PCOS are taking medication to cure it, which can have long-term effects on their reproductive health.<sup>[3]</sup> Losing weight and taking medication to improve insulin sensitivity can help.<sup>[3]</sup> If you are dealing with diabetes or prediabetes, your healthcare professional may recommend medication.<sup>[3]</sup> Birth control pills can help restore hormonal balance and regularize the menstrual cycle.<sup>[4]</sup> Additionally, oral contraceptives may contribute to reducing unwanted hair growth, enhancing skin condition, and lowering the risk of cancer.<sup>[4]</sup> Consultation with a specialist is advisable when exploring medication options and procedures aimed at inducing ovulation.<sup>[4]</sup> Nutrition and exercise should be tailored to the individual's needs and preferences.<sup>[4]</sup> Drugs to improve insulin sensitivity or promote weight loss can be beneficial when used early in combination with diet and exercise.<sup>[4]</sup>

This PCOS is becoming more common day by day due to unhealthy and stressful lifestyles so people have to understand its effect on female reproductive as well as overall mental and physical health along with its preventive measures. So that females will not face more complications in the near future.

## 2. What is PCOS?

PCOS stands as the most prevalent endocrine-metabolic disorder among women of reproductive age and is categorized into four recognized phenotypes: hyperandrogenism combined with oligo-anovulation, hyperandrogenism coupled with polycystic ovarian morphology, and oligo-anovulation in conjunction with polycystic ovarian morphology.<sup>[5]</sup>

PCOS is an ovarian disorder characterized by hormonal imbalance, androgen excess, cysts in the ovaries, and hirsutism, obesity, infertility, and menstrual disorders. It can be treated with lifestyle changes and medication, and long-term sequelae such as increased risk for cardiovascular events are unclear from epidemiologic studies. There are three common theories for the etiology of PCOS: one that it is due to hypothalamic-pituitary dysfunction, the second that it is due to ovarian (and adrenal) hyperandrogenism, and the third that it is primarily a disorder of peripheral insulin resistance.<sup>[6]</sup>

It is associated with endometrial cancer and even alterations in its function and receptivity.

## 3. How diet affect PCOS?

People with PCOS were found higher level of insulin. Insulin produced in pancreas, help to convert body sugar i.e., glucose into energy.

If our body don't produce enough insulin then sugar level will rise.

There is one another case;

Insulin resistance is a condition where the body produces more insulin to keep blood sugar levels normal, leading to increased production of androgen and difficulty in weight loss.<sup>[7]</sup> It is common in women with PCOS and is caused by refined carbohydrates, such as starchy and sugary foods.<sup>[7]</sup>

The most detrimental foods for PCOS are those that induce inflammation, disrupt hormonal balance, and elevate blood sugar levels.

Such foods are:-

1. Fried Foods
2. Alcohol
3. Processed Food
4. Caffeinated drinks
5. Red Meat
6. Sugary Drinks
7. Processed Meat
8. Dairy Products
9. Unhealthy Fats
10. Soy

These foods are disturbing hormones in their own way. Some are increasing oestrogen or androgenic hormones, some decreasing progesterone, causing bloating irritability etc.

#### **4. Effect of Ketogenic Diet:**

The direct impact of a ketogenic diet on PCOS is not well-established, and further research is needed to confirm its effectiveness over longer treatment periods.<sup>[9]</sup> However, it may offer a beneficial non-pharmacological approach.<sup>[9]</sup> The diet has shown promise in improving various biochemical parameters related to PCOS, such as those regulating the menstrual cycle.<sup>[9]</sup> It can reduce the LH/FSH ratio, decrease androgen production, and enhance insulin sensitivity.<sup>[9]</sup> A particular study concentrated on examining the relationship between the ketogenic diet and PCOS in overweight or obese women.<sup>[10]</sup> This investigation revealed substantial alterations in biochemical indicators, with statistically significant variances ( $p < 0.001$ ) when compared to alternative dietary methods such as the Mediterranean diet (MD).<sup>[10]</sup> These findings imply that reducing carbohydrate consumption through a ketogenic diet might serve as a valuable non-pharmacological strategy for addressing PCOS.<sup>[10]</sup>

#### **5. Effect of Pulse-based Diet:**

A dietary regimen centred on pulses, incorporating nutritious options like lentils, beans, and peas, demonstrated significantly greater advantages when compared to the Therapeutic Lifestyle Changes (TLC) diet.<sup>[11]</sup> It notably yielded a more substantial reduction in the insulin response curve, effectively lowered diastolic blood pressure, and led to a significant decrease in triglyceride levels.<sup>[11]</sup> Furthermore, it effectively curbed the levels of low-density lipoprotein cholesterol (LDL-C), while concurrently improving the favourable total cholesterol-to-high-density lipoprotein cholesterol (HDL-C) ratio.<sup>[11]</sup> In addition to these benefits, the pulse-based diet resulted in a notable increase in HDL-C levels, underscoring its superior efficacy in enhancing various cardio-metabolic health parameters in women diagnosed with PCOS.<sup>[11]</sup> This research underscores the potential of pulse-based dietary approaches as a potent strategy for improving the overall health profile of individuals grappling with PCOS.<sup>[11]</sup>

#### **6. Effect of lifestyle:**

In the Modern era, everyone is busy in their life. People don't have enough time to take care of their health, everyone is shifting to time-saving methods of eating fast foods, and packet food. Sleeping time is disturbed, and mental stress and pollution all these factors may lead to PCOS. Polycystic ovary syndrome (PCOS) is a common disease that affects 10% of women. A systematic review found no significant difference in menstrual cycles, pregnancy rates, or body mass indices between LSM and metformin.<sup>[12]</sup> LSM reduced insulin resistance and increased serum levels of sex hormone-binding globulins compared with metformin.<sup>[12]</sup>

First-line therapy for PCOS is centred on weight and lifestyle management, encompassing dietary, physical activity, and behavioural approaches.<sup>[13]</sup> Ongoing research explores the potential benefits of sleep interventions, psychological interventions, as well as traditional, complementary, and integrative medicine (TCIM) methods to optimize PCOS management.<sup>[13]</sup> It's important to note that there is no one-size-fits-all dietary solution for PCOS, as it varies depending on factors such as BMI, metabolism, age, and other individual variables.<sup>[13]</sup> Vigorous aerobic exercise has demonstrated improvements in body composition, cardiorespiratory fitness, and insulin resistance, although clinical intervention efficacy remains inconclusive.<sup>[13]</sup> Inositol supplementation has shown promise, but further research is required to determine its effectiveness in specific PCOS populations, including consistent approaches to intervention delivery, duration, and comparators.<sup>[13]</sup> It is crucial for medical practitioners to expand their knowledge regarding the effects and safety measures of these therapies and to appropriately integrate them into medical care as adjuncts.<sup>[13]</sup> Weight management stands as a primary treatment approach for women with PCOS.<sup>[14]</sup> Behavioural and psychological strategies have proven effective in addressing weight management challenges in PCOS, with techniques like goal setting, self-monitoring, cognitive restructuring, problem-solving, and relapse prevention not only aiding in weight management but also in managing stress, anxiety, and other mental health issues commonly associated with PCOS.<sup>[14]</sup> These strategies can be applied across various reproductive life stages in the clinical management of women with PCOS.<sup>[14]</sup>

## 7. Effect of Exercise:

One study examined the potential effects of aerobic exercise on interleukin-6 (IL-6), tumour necrosis factor (TNF), and C-reactive protein (CRP) in PCOS women. A random trial was conducted with 40 females or varied age groups between 25-35 years diagnosed with PCOS.<sup>[15]</sup> After the trial result were analysed, it showed a significant reduction in IL-6, TNF and CRP value in both AEM and M group after 12 weeks of intervention.<sup>[15]</sup> Whereas women who received same treatment along with aerobic exercise shows much more reduction in above mentioned factors than those who got same treatment excluding aerobic exercise.<sup>[15]</sup> Even some clinical trials say that aerobic exercises reduce risk factors associated with PCOS and other health issues too.<sup>[15]</sup> It improves Insulin level, maintains male hormones, healthy BMI, body resistance against disease and strength training.<sup>[16]</sup> Yoga also helps in maintaining hormonal imbalance and promotes a healthy reproductive health, but further more investigation is needed to claim more about it.<sup>[16]</sup> Some modification in lifestyle and diet along with exercise is mentioned in Fig 7.1.<sup>[17]</sup> Women with PCOS lack certain vitamins & minerals, in taking them will be more beneficial in the treatment of PCOS.<sup>[17]</sup> Certain specific vitamins (such as B-12, inositol, folate, vitamins D, E, and K), vitamin-like compounds (including bioflavonoids and lipoic acid), essential minerals (like calcium, zinc, selenium, and chromium picolinate), and various other formulations (including melatonin, omega-3 fatty acids, probiotics, and cinnamon), when coupled with lifestyle practices such as exercise, yoga, acupuncture, meditation, and more, can offer notable benefits for PCOS management.<sup>[17]</sup> Still this is the area of uncertainty and certain limitations that should be overcome before the implementation of them in routine practice for the treatment of PCOS.<sup>[17]</sup>

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
HIIT or Weight training Upper Body + Stretch	Barre Workout	30-45 min walk	HIIT or Weight training Lower Body + Stretch	30-45 min walk	Yoga or Pilates	Rest or Stretch/Foam Roll

**Fig: 7.1** A weekly Work-out schedule to beat PCOS

## 8. Conclusion:

PCOS (Polycystic Ovary Syndrome) is one of the most concerning topics among women of reproductive age. There is no proven medication for the treatment of PCOS, and many women are suffering or have undergone the wrong medications due to a lack of proper knowledge. To decrease the effect of PCOS, one should go for their routine check-up and consult their physician. PCOS is an endocrine metabolic disorder that is nothing but a hormonal imbalance, and can be cured in natural ways by following a healthy lifestyle, diet, and physical activity. Proper knowledge and awareness about PCOS are important among youth (men & women) and women suffering from PCOS.

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