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Review

## Polycystic Ovarian Syndrome (Pcos)- An Overview

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	<p><b>Abstract</b></p>
<p>Published on:18 Feb 2025</p>	<p>The aim of this review is to provide an overview on the Polycystic Ovarian Syndrome (PCOS) including its causes, Symptoms and management. The most prevalent endocrine and metabolic conditions affecting women in their Reproductive years is PCOS. About 116 million women worldwide (3.4%) may be impacted by PCOS, according to data From the World Health Organization (WHO). This is a heterogeneous endocrine condition that manifests as insulin Resistance, increased testosterone levels, swollen and malfunctioning ovaries, and other symptoms. This paper covers The information about the polycystic ovary syndrome, its causes, symptoms, pathogenesis and its management in brief. External causes include genetic mechanism, diet and environmental factors while iWHO are the internal causes. Irregular periods, hirsutism, acne &amp; oily skin, mood swings, Weight gain, heavy bleeding, hair thinning, diabetes, pelvic pain, sleep problems and skin darkening are the main signs And symptoms of the PCOS. Pathogenesis of PCOS involves alteration in insulin secretion, change in gonadotropin –Releasing hormone and excess androgen level. When treating PCOS, more focus should be placed on the patient’s adherence to treatment.</p>
<p>Published by: DrSriram Publications</p> <p>2025  All rights reserved.</p>  <p><a href="#">Creative Commons Attribution 4.0 International License.</a></p>	<p>Keywords:Polycystic Ovarian Syndrome (PCOS, WHO, insulin Resistance, increased testosterone levels, swollen and malfunctioning ovaries,</p>

## INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common female endocrine disorder that affects 6-15% of the female population. It is primarily characterized by an extremely irregular menstrual cycle in which ovulation does not occur. The major endocrine gland that involved in the PCOS are hypothalamus, pituitary gland, ovaries and adrenal gland and peripheral adipose tissue that together contribute to create a generally imbalance. Most symptoms first appear in adolescence around the start of menstruation. However, some women don’t develop symptoms until early-mid 20’s. It is also known as Stein-Leventhal syndrome or hyper androgenic anovulation (HA). It also referred to as syndrome “o” that is over nourishment, overproduction of insulin, ovarian confusion and ovulatory disruption. It is associated with the development of type-2 diabetes and recurrent miscarriage. A

PCOS patient ovaries contains more than ten follicles visible on ultrasound. The polycystic ovary, in comparison to normal ovary, its layer has more follicle and has a dense centre. This centre is known as stroma which is where testosterone made.

However polycystic ovaries are non-specific finding noted in women with no endocrine or metabolic abnormalities. PCOS is one of leading cause of female subfertility and the most frequent endocrine problem in women of reproductive age. The cysts are not harmful but lead to hormone imbalances and cause problems of periods and make difficult to get pregnant. In clinical practice, 75% of women with PCOS suffer from Anovulation infertility and 50% of them experience recurrent Pregnancy loss. However, it not clear whether these defects are Caused by uterine dysfunction itself or by the interrupted interaction Between uterine cells and developing embryo. Young women with PCOS induced endometrial hyperplasia are more likely than non PCOS women to develop endometrial carcinoma. He precise Aetiology and pathogenesis of PCOS remain uncertain PCOS are Commonly found by the use of ultrasound, magnetic resonance Imaging (MRI) and computed tomography. (1) Figure 1: Polycystic ovarian syndrome (PCOS) PCOS is a heterogeneous disorder that affects at least 7% of adult women. According to the National Institute of Health Office of Diseases Prevention, PCOS affects approximately 5 million women of childbearing age in the U.S. Costs to the Healthcare system of research suggests that 5-10 % females 18 to 44 years of age are affected by PCOS making it the most common endocrine abnormality among women of reproductive age in the U.S women seeking help from health care professionals to resolve issues of obesity, acne, amenorrhea, excessive hair growth and infertility often receive a diagnosis of PCOS. Women with PCOS have higher rates of endometrial cancer, cardiovascular disease, dysliodemia and type 2diabetes mellitus.[2]

The vaginal and gut microbiomes are defined as the communities of microorganisms that reside in the vagina and gut, respectively. The vaginal microbiome is very dynamic in nature and dysbiosis can arise due to various factors that lead to an altered vaginal pH or abnormal ratios of reproductive hormones. Such factors include gestational status, menstrual cycle, sexual activity, and contraceptive use. In the context of PCOS, an aberrant LH to FSH ratio likely contributes to decreased Lactobacillus in the vaginal microbiome, therefore leading to dysbiosis.

This is significant as these Lactobacillus species serve to lower the vaginal pH, which is needed to create an unfavourable environment for the growth of pathogenic species such as *Candida albicans*. In contrast, a non-Lactobacillus-dominated vaginal microbiome is associated with an increased risk of sexually transmitted infections.(3)

Likewise, the gut microbiome has an important immunomodulatory function, which can be pathogenically altered in obese patients with a high-fat-low-fibre diet. It is currently hypothesized that gut microbiome dysbiosis in the previously mentioned population activates the immune system and ultimately leads to insulin receptor malfunction and hyperinsulinemia. Hyperinsulinemia is believed to increase ovarian androgen production and aberrantly affect antral follicle development. This hypothesis could potentially explain the pathophysiology of PCOS, as it accounts for the hyper-insulin emic, hyper androgenic, and an ovulatory states seen in PCOS. Furthermore, crosstalk exists between the gut and vaginal microbiomes For instance, although the short-chain fatty acids in the gut microbiome contribute to a state of homeostasis and promote emboss in the gut, they may lead to inflammation and dysbiosis in the vagina. Although the literature has explored the role of the gut microbiome in PCOs, the development of vaginal microbiome dysbiosis in PCOS has not been researched thoroughly. In turn, the aim of this review is to explore the relationship between vaginal microbiome dysbiosis and PCOS and identify potential theories for the mechanism of action for this relationship. (4)

This syndrome is linked to numerous health issues, including infertility, metabolic syndrome, obesity, impaired Glucose tolerance, type 2 diabetes, cardiovascular risk, depression, obstructive sleep apnoea, endometrial cancer, And non-alcoholic fatty liver disease/non-alcoholic steatohepatitis (5)

### **Types Of Classification**

There are 4 types of PCOS. They are:

Insulin resistant PCOS  
Post pill PCOS  
Inflammatory PCOS  
Adrenal PCOS.

### **Insulin Resistant PCOS**

Insulin resistant PCOS is also called as Classic PCOS. The most common type caused by insulin resistance leading to high insulin levels.

The symptoms of are weight gain, difficulty in losing weight, irregular periods.

### **Post Pill PCOS**

Causes are temporary hormonal imbalance after discontinuing oral contraceptives particularly those containing

synthetic progestins Symptoms are irregular periods, mild symptoms of Acne, hair growth.

### **Inflammatory PCOS**

Causes: Chronic inflammation in the body often due to life style factors like poor diet, environmental toxins or injections.

Symptoms: Fatigue, skin conditions (like eczema), digestive issues.

### **Adrenal PCOS**

Causes: Excess androgen projection from adrenal glands triggered by abnormal response to stress hormone cortisol. (6)

### **Epidermology**

Only a few researchers have studied the prevalence Of PCOS in India and among those, which might not Reflect the true status of PCOS prevalence in the Community. A pilot cross-sectional study conducted In Tamil Nadu assessed young adolescent females and found a prevalence of 18 per cent for PCOS<sup>14</sup>. They also concluded that the proportion of PCOS Was higher in urban women in comparison to the Rural women. A similar study conducted in Mumbai, which was an urban community-based study, found that the prevalence of PCOS was 22.5 per cent by the Rotterdam criteria and 10.7 per cent by the Androgen Excess Society criteria<sup>15</sup>. A study conducted among Medical students at a private medical college in south India using the modified Cronin questionnaire<sup>16</sup>, which Included 10 items, found that PCOS was a common disorder among the participants and reported a high incidence of mood disorders among them. A study from Lucknow was published, in which college-going women with menstrual irregularity and hirsutism, in the age range of 18-25 yr, were studied, and it was reported that the calculated prevalence using the NIH criteria, among the participants, was only 3.7 per cent<sup>17</sup>. Another study from Andhra Pradesh studied young women from a residential college and found that 9.13 per cent of them satisfied the Rotterdam criteria for PCOS<sup>18</sup>. Vidya Bharathi et al<sup>19</sup> showed that the prevalence of PCOS diagnosed by the Rotterdam criteria in community-dwelling women from rural and urban areas of Chennai was 6 per cent. International studies report the prevalence of PCOS to be in the range of 4-10 per cent of women of reproductive age<sup>20</sup>. As the prevalence of PCOS has been found to be higher or lower depending on the criteria used in these studies, which might be the obvious reason for the discrepancy in the prevalence rates among the studies from India, it is difficult to draw a clear conclusion. (7)

### **Pathogenesis**

Excessive adrenal androgen secretion and/or ovarian secretion are the characteristics of PCOS. The overproduction of ovarian androgen is caused by both intrinsic ovarian factor such as altered steroidogenesis and external factor hyperinsulinemia. Theca cells in the ovary support developing follicles physiologically, aiding in the production of mature oocytes. Patients with PCOS experience ovarian hypothesis due to the hyper responsiveness of theca cells to stimulatory actions of insulin.

The symptoms of PCOS are exacerbated by insulin resistance in peripheral tissues, which increases the androgenic potential in theca cells. Furthermore, an additional factor contributing to hyperandrogenism in PCOS is the increased sensitivity of theca cells to gonadal steroid gonadotropin activation. A number of factors, including changes in adipose cell activity, inflammatory factors, neuroendocrine function, metabolism, steroidogenesis, ovarian folliculogenesis, insulin production, and insulin sensitivity may have impact on the pathophysiology of this illness.(8)

### **Signs And Symptoms**

The signs and symptoms of PCOS include:

Irregular periods

Excessive facial hair and body hair

Oily skin or acne

Mood swings

Weight gain

Heavy bleeding

Hair thinning

Diabetes

Pelvic pain

Sleep problems

Skin darkening.(9)

### **Causes**

The causes of Polycystic Ovarian Syndrome may include:

External factors  
Genetic mechanism  
Internal factors  
Inflammation.  
Skin tags  
Inflammation  
Stress  
Pelvic pain  
Irregular menstrual cycle  
Acne  
Hirsutism  
Insulin resistance  
Enlarged ovaries with numerous small tags. (10)

### **Treatment**

the treatment of PCOS are  
Lifestyle  
Pharmacological approaches  
Healthy eating  
Taking vitamins  
Reducing and managing stress  
High quality sleep  
Blood sugar controlling  
Manage weight  
Surgery  
Insulin sensitising agents  
Acne treatments  
Anovulation  
Healthy balanced diet  
Treatment with birth control

### **Latest Improvement**

The best way to deal with PCOS is  
To maintain a healthy diet  
To eat nutritious food  
To do exercises regularly  
Reduce caffeine  
Limit of alcohol consumption  
Manage weight  
Blood sugar controlling  
Using medications  
Adequate sleep  
Stress management

### **SUMMARY**

PCOS is most common and complex disorder in women of reproductive age. It is caused due to various factor including Environmental factors, genetic mechanism, diet, obesity, insulin remittance, hyperandrogenism, etc. And manifests as Irregular periods, hirsutism, increased testosterone levels, weight gain, acne, mood swings etc. Depending on the cause Of PCOS, multiple techniques are used to treat this condition. This review provides the information about PCOS, its Cause, symptom, pathogenesis and its management to raise the awareness among women to prevent this Complicated condition.(11)

PCOS is complex hormonal condition and Have various effect of multiple effects in Body. Various treatment strategies are under Research for treatment of PCOS including Exercises. Based on the review of articles included in the study it can be concluded That aerobic exercises of moderate to high Intensity have significant improvement in Insulin resistance, reducing testosterone and Reducing body weight, BMI, mood and Quality of life in PCOS females. Aerobic Exercises did not show significant effect in Function of complement pathways. Prevalence of PCOS is high hence more Concrete evidence for treatment approaches Are desirable that allows a scope of further Research in this area.(12)

Establishing a Diagnosis of PCOS is problematic in adolescents and menopausal women. Hyperandrogenism is Central to the presentation in adolescents, whereas there is no consistent phenotype in

postmenopausal women. Evaluation of women with PCOS should exclude alternate androgen excess disorders and risk factors for endometrial cancer, mood disorders, obstructive sleep apnoea, diabetes, and Cardiovascular disease. Hormonal contraceptives are the first-line management for menstrual abnormalities and hirsutism/acne in PCOS.(13)

## CONCLUSION

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in Women. The clinical manifestation of PCOS varies from a mild menstrual disorder to severe Disturbance of reproductive and metabolic functions. Management of women with PCOS depends On the symptoms. These could be ovulatory dysfunction-related infertility, menstrual disorder, Or androgen-related symptom. Weight loss improves the endocrine profile and increasing the Likelihood of ovulation and pregnancy. Normalization of menstrual cycles and ovulation could Occur with modest weight loss as little as 5% of the initial weight. The treatment of obesity Includes modifications in lifestyle (diet and exercise) and medical and surgical treatment. Polycystic ovary syndrome (PCOS) is one of the most prevalent endocrine Syndrome affecting women at reproductive age. With increasing knowledge of the role of the Microbiota in the pathogenesis of PCOS, new management strategies began to emerge. However, Data on the impact of established treatment regimens, such as metformin and oral contraceptive Agents, on the gut microbiota composition are scarce.

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