

Polycystic ovarian syndrome: An overview

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REVIEW

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ABSTRACT

Introduction

Polycystic Ovarian Syndrome (PCOS) is a common endocrinal disorder among females of reproductive age, which causes- hirsutism, Oligomenorrhea and infertility. It generally occurs in the female ageing between 12–44 years. Some studies show that it is a lifestyle disorder, which affects women of middle and high-income population. It causes hormonal imbalance and certain physical changes. Management of PCOS can be achieved by medication, lifestyle changes, exercises, or surgical method. It has a high risk of miscarriages and during pregnancy, women are at a high risk to develop Gestational diabetes, hypertension. Significant disparities in the different domains of the SF-36 between PCOS and healthy controls were observed in several categories of age, BMI, educational status, and marital status. Increased BMI, menstrual abnormalities, educational status, and marital status all play a role in affecting quality related to life in PCOS patients, and psychological support must be provided throughout treatment.

Conclusion

This article concludes about PCOS– its symptoms, causes, leads to, treatment and PCOS Pregnancy. The difference between PCOS and PCOD is also mentioned, which gives a brief differentiation between both the conditions. The goal is to help people understand what actually PCOS means and

to enhance people to take preferable steps to suppress the condition and one should consult a gynaecologist if they have shown-up any symptom(s).

Key Words

PCOS, Hirsutism, Oligomenorrhea, Miscarriage, Gestational diabetes and gynaecologist

Introduction

PCOS (Polycystic Ovarian Syndrome) is most commonly found in 15–20 per cent females. Women with PCOS face several physical, mental as well as hormonal issues¹. It also affects menstrual cycles and androgen level in body. Women are at a risk of multiple complications; including obesity, insulin resistance, type II diabetes mellitus, cardiovascular disease (CVD), infertility, cancer and psychological disorders². PCOS is a lifetime syndrome. It may or may not affect both ovary³. Hyperandrogenism, a clinical sign of PCOS, may cause obstacle in follicular development (production of oocyte), small cysts in ovaries, menstrual patterns⁴.

PCOS affects around 5 million childbearing women in U.S., which costs healthcare system around \$4 billion per year to manage and identify it⁵. In India, according to a study conducted by AIIMS department of endocrinology and metabolism, roughly 20–25 per cent of Indian women of reproductive age have PCOS. While 60 per cent of women with PCOS are overweight, 35–50 per cent has a fatty liver. Around 70 per cent of people have insulin resistance, 60–70 per cent has elevated testosterone levels and 40–60 per cent has glucose intolerance⁶. Elevated luteinizing hormone (LH) and gonadotropin-releasing hormone (GnRH) levels are clinical indications of PCOS, although follicular- stimulating hormones (FSH) levels are muted or unchanged. The stimulation of the ovarian thecal cells, because of the rise in GnRH, creates more androgens⁷. To treat follicular arrest, endogenous FSH levels can be boosted or exogenous FSH can be given⁸. PCOS is a prominent aberration among young females entering puberty who have a family history of the

illness, according to some study. Prolactin levels are abnormally high in about 25 per cent of PCOS patients⁹. Some studies shows that patient with PCOS have high level of testosterone, 17-hydraprogesterone and progesterone than normal quantity. These cells have been changed in PCOS individuals with high levels of the cytochrome P450 (CYP) 11A, 3-HSD 2, and CYP17 genes¹⁰. Obesity is a prevalent comorbidity of PCOS; however, it is not a diagnostic requirement.

Symptoms

Irregular or delayed or no periods, hair falls, hirsutism, acne, thinning of hair, weight gain and pigmentation

Reasons

Obesity, lifestyle changes, genetically inheritance, type II diabetes

Causes

Infertility, periods with heavy flow, diabetes, thyroid, heart diseases, high blood pressure, high cholesterol, cancer of uterus, depression and anxiety

Diagnosis

It is important to diagnose the PCOS to maintain the fertility, symptom control, and to avert difficulties to conceive and post menopause phase. Ultrasound is another method to diagnose. Many women get PCOS from their female relatives, who have PCOS, even if it was not detected. For the identification, one should consult gynaecologist. Following characteristic define a polycystic ovary; 20 or more follicles measuring 2-9mm in diameter or an enlarged ovarian volume (>10ml), with peripherally distributed follicles, there is usually more central stroma¹¹.

Treatment

As there is no permanent cure for PCOS, yet can be suppressed or overcome the problem by some methods, these are: lifestyle changes (first-line treatment), exercise, eating patterns (low carbohydrate, high protein diet), clomiphene citrate, metformin, laparoscopic ovarian surgery, aromatase inhibitors, and oral medication of hormonal pills¹². (Table 1)

Discussion

The progression of PCOS during different life stages is poorly established because to a dearth of cohort studies with long-term follow-up. A study evaluated clinical and biochemical markers in PCOS women with healthy controls who first attended a health centre at the age of 29 and returned 6 years later. In this longitudinal study, ageing was linked to an increase in the frequency of monthly menstrual cycles, a drop in serum testosterone levels, and a decrease in IR¹³. The causes for this gradual fading of PCOS symptoms are unknown. Other researches, as listed below, have focused on PCOS manifestations in certain age groups.

PCOS in childhood

The pathophysiology of PCOS is mostly determined by a genetic predisposition as well as some prenatal and postnatal environmental factors. Increases in glucocorticoids production due to intrauterine growth retardation or small for gestational age (or both) caused by high levels of androgens during the intrauterine period could cause epigenetic modifications and raise the risk of PCOS¹⁴.

PCOS in adolescence

PCOS is mainly diagnosed during adolescence. Irregular periods, hirsutism, acne are major symptoms. These features sometimes overcome in normal adolescence. The factors, which are linked to the syndrome, are family history of disorder, being overweight or underweight at birth, being exposed to androgens during pregnancy, precocious puberty, obesity and IR. In puberty, PCOS is detected following stronger criteria than in adult woman¹⁵. Adolescents with PCOS have higher chances of MS (Multiple Sclerosis), as per recent studies, and should be urged to start living a healthy lifestyle¹⁶. Dietary guidance, physical activity stimulation, and self-care should all be part of adolescent girl's part of care¹⁵.

PCOS after menopause

Women with PCOS continue to have hyperandrogenism long after menopause, resulting in metabolic changes and MS, as well as a higher risk of cardiovascular disease. As a result, PCOS abnormalities may continue in postmenopausal women who had the problem during their reproductive years¹⁷⁻¹⁹.

Pregnancy with PCOS

The metabolic characteristics of PCOS women include hyperandrogenism and insulin resistance. Intrinsic insulin resistance affects a large percentage of underweight PCOS women. The excessive adipose tissue in those with superimposed obesity promotes to greater insulin resistance²⁰. Insulin resistance appears to be worsened when a woman gets conceived. Women with PCOS have a higher risk of pregnancy problems. Women with PCOS were more likely to be obese and to utilise assisted reproductive technology in a population-based cohort research than women without the diagnosis²¹.

PCOS and miscarriages

Women with PCOS are at risk of having Early Pregnancy Loss (EPL), which is clinically defined as a first-trimester miscarriage. EPL affects 30 to 50 per cent of PCOS women, compared to 10 to 15 per cent of healthy women^{22,23}. As compared to normal pregnancies, PCOS pregnancy has a more risk of early and spontaneous termination or EPL because they are being treated with suitable medications to prepare their body for implantation. Therefore, the

incidence of spontaneous EPL in PCOS women who conceive naturally is unidentified. Several mechanisms have been suggested the higher risk of EPL in women with PCOS, and they are not completely exclusive. There are many more factors of the early termination of pregnancies like hormonal imbalance [ups and downs of important hormones like Luteinizing Hormone (LH), Androgens, Insulin], Endometrial Dysfunction, Insulin resistance, Fibrinolysis, Obesity.

Treatment for complications in PCOS pregnancy

Insulin sensitizers such as metformin are routinely utilised. In a first clinical study of PCOS women relative to historical controls, Glueck et al. proved the benefits of metformin for minimizing EPL²⁴. Metformin works by reducing body weight, insulin and PAI-1 levels, testosterone and LH levels²⁵, as well as elevating serum IGFBP-1 and glycodelin levels²⁶. Metformin activates AMP kinase (AMPK), and improves upregulating in the blastocyst and results in better pregnancy outcomes, as per the Eng et al²⁷.

Conclusion

PCOS (Polycystic Ovary Syndrome) is disorder in which genetic and environmental factors control the disorder. Poor lifestyle, eating patterns, can increase environmental factors linked to PCOS. The general symptoms are irregular or delayed periods, hirsutism, weight gain, acne, fatigue. It creates some physical changes like obesity, hair fall, pigmentation, facial hairs. Some other disorders are also linked with it like type II diabetes mellitus, hyperthyroidism, cardiovascular problems, and infertility. As there is no such cure for PCOS but it can be suppressed by some ways like exercise, food patterns, some medications, surgical methods.

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Figures and Tables

Table 1: Basic difference between PCOS and PCOD¹².

Characters	PCOS (Polycystic Ovary Syndrome)	PCOD (Polycystic Ovary Disorder)
Factors causing	It is an endocrinal disorder.	It is developed by hormonal imbalance.
Occurrence	It has a smaller number of patients.	It is more common than PCOS. Approximately one-third women have PCOD.
Effect on pregnancy	Due to hormonal imbalance, it is difficult to conceive and as there is high number of androgens, the conception becomes a bit difficult.	Not leads to infertility, women can conceive by some medical treatments and can have a smooth pregnancy.

Figure 1: Multidisciplinary team's patient-care therapy may help to attain the key aims of polycystic ovary syndrome management¹⁵.

