

# Polycystic Ovary Syndrome

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## Key Points

- Ovaries produce an abnormal amount of androgens
- clinical syndrome characterized by moderate obesity, irregular periods or absence of menstruation, and signs of androgen excess
- Diagnosis is based on pregnancy test results, hormone measurements, and imaging to rule out a tumor in ovary
- Treatment is symptomatic

Polycystic ovary syndrome (PCOS) is a condition in which those ovaries produce an abnormal amount of androgen, male sex hormones that are usually present in women in small amount. Polycystic ovary syndrome is a clinical syndrome characterized by moderate obesity, irregular periods or absence of menstruation, and signs of androgen excess (e.g, hirsutism, acne). Most patients have multiple ovarian cysts. The developing hypercholesterolemia in hypothyroidism and polycystic ovary syndrome leads to the progression of atherosclerotic changes in the vessels and the occurrence of cardiovascular diseases. Diagnosis is based on pregnancy test results, hormone measurements, and imaging to rule out a tumor in ovary. Treatment is symptomatic. The name polycystic ovary syndrome (PCOS) describes the numerous small cysts (fluid filled sacs) that form in the ovaries.<sup>1</sup>

Polycystic ovary syndrome is a hormonal disorder common in women of breeding age. The incidence of PCOS is about 30% among patients of gynecologists-endocrinologists, and in the structure of endocrine infertility it reaches 75%. Up to 95% of cases of hirsutism in women are associated with polycystic ovary syndrome. Diagnostic methods are extensive and are not limited only to the reproductive sphere. Among patients with endocrine infertility, PCOS occurs in 30-40% of cases. PCOS is one of the most common endocrine and metabolic disorder in premenopausal women. Symptoms include

infertility, weight gain especially around abdomen, acne or oily skin, excess body hairs, irregular periods.<sup>2</sup>

Lifestyle modification is widely considered to be the cornerstone of polycystic ovary syndrome (PCOS) treatment. However, 45% of women with PCOS have reported that they have never been provided information about lifestyle management. This highlights a significant gap in knowledge and is reflective of the lack of evidence-based guidance for lifestyle modification. While more detailed and comprehensive studies are being performed, it is necessary for health care provider to develop effective action. Such as regular exercise has many benefits in treating PCOS. It helps you combat obesity by burning calories and building muscle mass, which decreases insulin resistance. Exercise can also help lower cholesterol levels and those of other hormones, such as testosterone.<sup>3</sup>

Although diagnosis of PCOS is based on reproductive and endocrinological traits, associated metabolic features of the condition have become more recognized as key PCOS features; therefore, new interventions that target metabolic PCOS traits are needed. A latest publication, by Wang et al <sup>1</sup> highlights the potential involvement of a mitochondria-derived peptide, humanin, in the pathology of PCOS, and how a humanin analogue, HNG, could be a prospective treatment to alleviate the insulin resistance (IR) associated with

PCOS.HNG supplementation was Emerging data support the use of natural compounds such as inositols, myo- and D-chiro-inositol, alone or together with.<sup>4</sup>

Considering the heterogeneity of this condition, various therapeutic approaches have been attempted in PCOS women, besides the classical treatments such as metformin or pioglitazone. Data support natural compounds such as inositols, myo- and D-chiro-inositol, alone or in combination. Including, vitamins and dietary factors such as vitamin D, alpha-lipoic acid, omega 3, melatonin and probiotics may be efficient in PCOS treatment counteracting its endocrine and metabolic aspects, along with their secondary complications.<sup>5</sup>

Diagnostic criteria for PCOS have been set by National Institutes of Health (NIH) 1990, Rotterdam 2003, AE-PCOS Society 2006, NIH 2012/International PCOS Guidelines 2018. To detect the presence or absence of PCOS, each of these suggests criteria that have slightly different biological, clinical and image-based findings (Okoroh, 2012). An international evidence-based guideline for the assessment PCOS released in 2018 recommends the use of the Rotterdam diagnostic criteria (Teede et al., 2018). Rotterdam criteria is accepted criteria in Asia, Australia and Europe (Stepito et al., 2013; Yildiz et al., 2012.). This criteria shows the presence of polycystic ovaries and hyperandrogenism in females with normal menstrual cycles, and also women with polycystic ovaries and ovulatory disturbance without hyperandrogenism (Broekmans et al., 2006). The diagnosis necessitates the presence of at least two of the three findings on ultrasound i.e., hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology (Tracy, 2016).<sup>6</sup>

Vitamin D (VD) might play an important role in polycystic ovary syndrome (PCOS). However, evidence from randomized controlled trials (RCT) is sparse. We examined VD effects on anti-Müllerian hormone (AMH) and other endocrine markers in PCOS and non-PCOS women. This is a post hoc analysis of a single-center, double-blind RCT

conducted between December 2011 and October 2017 at the endocrine outpatient clinic at the Medical University of Graz, Austria. We included 180 PCOS women and 150 non-PCOS women with serum 25-hydroxyvitamin D (25(OH)D) concentrations <75 nmol/L in the trial. We randomized subjects to receive 20,000 IU of VD3/week (119 PCOS, 99 non-PCOS women) or placebo (61 PCOS, 51 non-PCOS women) for 24 weeks. Outcome measures were AMH, follicle-stimulating hormone (FSH), luteinizing hormone (LH), estradiol, dehydroepiandrosterone sulfate, and androstenedione. In PCOS women, we observed a significant treatment effect on FSH (mean treatment effect 0.94, 95% confidence interval [CI] 0.087 to 1.799,  $p = 0.031$ ) and LH/FSH ratio (mean treatment effect -0.335, 95% CI -0.621 to 0.050,  $p = 0.022$ ), on the other hand no significant effect was observed in non-PCOS women. In PCOS women, VD treatment for 24 weeks had a significant effect on FSH and LH/FSH ratio but no effect on AMH levels.<sup>7</sup>

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