

Polycystic ovary syndrome

Overview

Polycystic ovary syndrome (PCOS) is a condition most often characterized by irregular menstrual periods, excess hair growth and obesity, but it can affect women in a variety of ways. Irregular or heavy periods may signal the condition in adolescence, or polycystic ovary syndrome may become apparent later when a woman has difficulty becoming pregnant.

The signs and symptoms of polycystic ovary syndrome stem from a disruption in the reproductive cycle, which normally culminates each month with the release of an egg from an ovary (ovulation). The name polycystic ovary syndrome comes from the appearance of the ovaries in some women with the disorder — large and studded with numerous cysts (polycystic). These cysts are follicles, fluid-filled sacs that contain immature eggs.

Polycystic ovary syndrome is the most common hormonal disorder among women of reproductive age in the United States, affecting an estimated 5 percent to 10 percent. Early diagnosis and treatment of polycystic ovary syndrome can help reduce the risk of long-term complications, which include diabetes and heart disease.

Signs and symptoms

Women with polycystic ovary syndrome may have any of several signs of varying severity. Criteria for diagnosing the disorder include having at least two of the following indications:

- **Irregular or no menstruation.** This is the most common finding in PCOS. Irregular menstruation means having menstrual cycles that occur at intervals longer than 35 days or fewer than eight times a year. The condition may begin in adolescence with the onset of menstruation.
- **Excess androgen.** Elevated levels of male hormones may result in physical signs such as long, coarse hair on your face, chest, lower abdomen, back, upper arms or upper legs (hirsutism), acne and male-pattern baldness (alopecia). However, not all women who have polycystic ovary syndrome have physical signs of androgen excess.
- **Enlarged ovaries with multiple cysts.** A doctor may detect ovarian cysts by ultrasound. However, a woman may have ovaries with multiple cysts but still not have polycystic ovary syndrome. And a woman with PCOS may have ovaries that appear normal. You must also have abnormal menstrual cycles or excess androgen levels to be diagnosed with PCOS.

Several other disorders can cause signs and symptoms similar to those of polycystic ovary syndrome:

- **Hypothyroidism.** In this condition, your body produces too little thyroid hormone, which can lead to an absence of menstruation (amenorrhea).
- **Hyperprolactinemia.** This condition causes your pituitary gland to produce too much prolactin, a hormone that stimulates the production of breast milk and suppresses ovulation.
- **Certain tumors.** Tumors of the ovary or adrenal gland can be responsible for excess androgen levels.

Doctors rule out the above conditions before diagnosing PCOS.

Many women with polycystic ovary syndrome are obese. The distribution of fat seems to affect the severity of symptoms. One study found that women who have central obesity — fat in the midsection or trunk of the body — have higher androgen, sugar and lipid levels than do women who have accumulated fat in their limbs.

Other possible conditions associated with polycystic ovary syndrome are:

- Infertility
- Acanthosis nigricans — darkened, velvety skin on the nape of your neck, armpits, inner thighs, vulva or under your breasts
- Chronic pelvic pain

Causes

The intricate process of a woman's reproductive cycle is regulated by fluctuating levels of hormones produced by the pituitary gland in your brain, including luteinizing hormone (LH) and follicle-stimulating hormone (FSH), and by your ovaries.

The ovaries secrete the female hormones estrogen and progesterone and also produce some androgens, the so-called male hormones. Androgens include testosterone, androstenedione and dehydroepiandrosterone (DHEA).

What happens in PCOS

In polycystic ovary syndrome, your body produces an excess of androgens, and your ratio of LH to FSH is often abnormally high. The process of ovaries releasing eggs (ovulation) occurs less frequently than normal (oligo-ovulation), or the ovaries don't release eggs at all (anovulation). In the absence of ovulation, the menstrual cycle is irregular or absent.

Doctors don't know the cause of polycystic ovary syndrome, but research suggests a link to excess insulin, the hormone produced in the pancreas that allows cells to use sugars (glucose), your body's primary energy supply. By several mechanisms, excess insulin is thought to boost androgen production by your ovaries. Studies also indicate that genetic factors may play a role in PCOS.

Although polycystic ovary syndrome has been noted since antiquity, it was first described in medical literature in the 1930s when Irving Stein and Michael Leventhal wrote about a group of women without menstrual periods (amenorrhea) who had large ovaries with multiple cysts.

Doctors sometimes call the condition Stein-Leventhal syndrome, polycystic ovaries or polycystic ovary disease.

When to seek medical advice

Early diagnosis of polycystic ovary syndrome can help reduce the risk of long-term complications such as diabetes and heart disease. Talk with your doctor if you have irregular, scant or no menstrual periods, are overweight, and have acne or excess facial hair growth. Your doctor may refer you to an endocrinologist, a doctor who specializes in hormonal disorders.

Screening and diagnosis

Your doctor may evaluate you for reproductive, hormonal and cardiovascular disorders. He or she will obtain a history of your symptoms and perform a complete physical examination, including a pelvic examination.

Other tests may include:

- **Blood tests.** Your blood may be drawn for laboratory tests to measure levels of several hormones. These may include testosterone, prolactin, and thyroid-stimulating hormone (TSH), which triggers the release of thyroid hormone from the thyroid gland. Additional blood testing may include fasting glucose, cholesterol and triglyceride levels.
- **Ultrasound.** Your doctor may request a pelvic ultrasound to check your ovaries and the thickness of the lining of your uterus. Ultrasound exams are painless. While you relax on a bed or examining table, a wand-like device (transducer) is placed on your body. It emits inaudible sound waves that are translated into images on a computer.

Complications

Women with polycystic ovary syndrome are at increased risk of type 2 diabetes, high blood pressure, increased triglycerides, decreased high-density lipoprotein (HDL) cholesterol and cardiovascular disease. Because PCOS disrupts the reproductive cycle and exposes the uterus to a constant supply of estrogen, women with PCOS are at risk of abnormal uterine bleeding and cancer of the uterine lining (endometrial cancer).

You may need treatment with fertility medications to become pregnant if you have polycystic ovary syndrome. During pregnancy, you may be at increased risk of gestational diabetes and pregnancy-induced high blood pressure.

Treatment

Management of polycystic ovary syndrome focuses on each woman's main concerns, such as infertility, hirsutism, acne or obesity. Long term, the most important aspect of treatment is managing cardiovascular risks such as obesity, high blood cholesterol, diabetes and high blood pressure. To help guide ongoing treatment decisions, your doctor will likely want to see you for regular visits to perform a physical examination, measure your blood pressure and obtain fasting glucose and lipid levels.

Women with polycystic ovary syndrome may benefit from counseling to help with healthy-eating choices and regular exercise. This is particularly important for overweight women with PCOS. Obesity makes insulin resistance worse. Weight loss can reduce both insulin and androgen levels, and may restore ovulation. However, you may have more difficulty losing weight than other women do. Ask your doctor to recommend a weight-control program, and meet regularly with a dietitian.

Your doctor may prescribe one or more medications to help manage the symptoms and risks associated with PCOS.

Medications for regulating your menstrual cycle

If you're not trying to become pregnant, your doctor may prescribe low-dose oral contraceptives that combine synthetic estrogen and progesterone. They decrease androgen production and give your body a break from the effects of continuous estrogen. This decreases your risk of endometrial cancer and corrects abnormal bleeding.

An alternative approach is taking progesterone for 10 to 14 days each month. This medication regulates your menstrual cycle and offers protection against endometrial cancer, but it doesn't improve androgen levels.

Your doctor also may prescribe metformin (Glucophage, Glucophage XR), an oral medication for type 2 diabetes that treats insulin resistance. This drug is still being studied as a treatment for polycystic ovary syndrome, but research has demonstrated that it improves ovulation and may reduce androgen levels. However, doctors don't yet know if metformin offers the same protection against endometrial cancer as does treatment with oral contraceptives or with progesterone alone.

Medications for reducing excessive hair growth

Your doctor may add a medication specifically targeted at countering the effects of excess androgen. Spironolactone (Aldactone) blocks the effects of androgen and reduces new androgen production. Spironolactone is also a diuretic and may cause you to urinate more frequently. Possible side effects include heartburn, headaches and fatigue. Other anti-androgen medications include finasteride (Propecia, Proscar) and flutamide (Eulexin).

Your doctor might also prescribe eflornithine (Vaniqa), a prescription cream that slows facial hair growth in women. You apply it twice daily. Avoid using this medication during pregnancy.

Medications for achieving pregnancy

To become pregnant, you may need a medication to trigger ovulation. Clomiphene (Clomid, Serophene) is an anti-estrogen medication that you take for five days in the first part of your menstrual cycle. If clomiphene alone isn't effective, your doctor may add metformin to help trigger ovulation.

If you don't become pregnant using clomiphene and metformin, your doctor may recommend using gonadotropins — FSH and LH medications that are administered by injection. Because many women with PCOS have elevated levels of LH, your doctor may recommend treatment with FSH alone.

Surgery

If medications don't help you become pregnant, your doctor may recommend an outpatient surgery called laparoscopic ovarian drilling. In this procedure, a surgeon makes a small incision in your abdomen and inserts a tube attached to a tiny camera (laparoscope). The camera provides the surgeon with detailed images of your ovaries and neighboring pelvic organs. The surgeon then inserts surgical instruments through other small incisions and uses electrical or laser energy to burn holes in enlarged follicles on the surface of the ovaries.

The goal is to stimulate ovulation by reducing levels of LH and androgen hormones. Doctors aren't sure how this occurs. One theory is that drilling destroys hormone-producing ovarian cells.

Hair removal

Several options exist for hair removal. They include shaving, plucking and over-the-counter remedies such as waxes, gels, creams and lotions (depilatories). However, depilatories may irritate your skin, so follow package directions and on first use, apply the product to an inconspicuous area to determine if it's suitable for you. The results last for weeks, then you must repeat treatment.

Options for longer lasting hair removal include:

- **Electrolysis.** To permanently remove excess hair, some women undergo electrolysis in addition to medical therapy. A fine needle is inserted into the hair follicle and electric current is applied to kill the follicle. Because only one follicle can be treated at a time, this method isn't useful for large areas of the body. Several treatments are usually necessary. Scarring or, rarely, skin infections may occur. Home electrolysis kits usually are ineffective because the hair follicle is deep in the skin, so seek care with an experienced, certified electrologist.
- **Laser therapy.** Laser hair removal systems use laser light — an intense, pulsating beam of light — to remove unwanted hair. Laser hair removal is effective only on short, visible hair. Two to three days before the procedure, you shave the area to be treated, and allow it to grow to a stubble. Your doctor may use multiple treatments to target the affected areas. After six months, laser procedures may remove 70 percent to 90 percent of targeted hair. Even after multiple treatments, however, you may experience some hair regrowth, although the new hair may be finer and lighter in color.

Self-care

You may hear conflicting advice from media, support groups and health care professionals on the role of diet in weight management. Much of the disagreement focuses on carbohydrates.

Carbohydrates are long chains of glucose, a type of sugar. Your digestive system splits these chains into small sugar molecules that enter your bloodstream and trigger the release of insulin.

Low-fat, high-carbohydrate diets that have been popular in recent years may increase insulin levels, so some health and nutrition advocates advise women with polycystic ovary syndrome to follow a low-carbohydrate diet. However, a diet that calls for increased protein to compensate for decreased carbohydrates may spike your intake of saturated fats, elevating your blood

cholesterol levels and increasing your risk of cardiovascular disease. And research hasn't demonstrated that a diet high in protein offers more benefit to women with PCOS than does a diet high in carbohydrates.

Choose complex carbohydrates

Carbohydrates provide many important nutrients, so don't severely restrict them. Instead, choose complex carbohydrates, which are high in fiber. The more fiber in a food, the more slowly it's digested and the more slowly your blood sugar levels rise. High-fiber carbohydrates include whole-grain breads and cereals, whole-wheat pasta, bulgur, barley, brown rice and beans. Limit less healthy, simple carbohydrates such as soda, excess fruit juice, cake, candy, ice cream, pies, cookies and doughnuts.

Additional research may determine which specific dietary approach is best, but it's clear that losing weight by reducing total calorie intake benefits women with polycystic ovary syndrome. Work with your doctor and registered dietitian to determine the best dietary plan for you.

Get your exercise

The importance of exercise is much less controversial. Exercise lowers your blood sugar by promoting the transfer of sugar from your blood to your cells through decreasing insulin resistance. For women with PCOS, an increase in daily physical activity and participation in a regular exercise regimen are essential for treating or preventing insulin resistance and for helping weight-control efforts.