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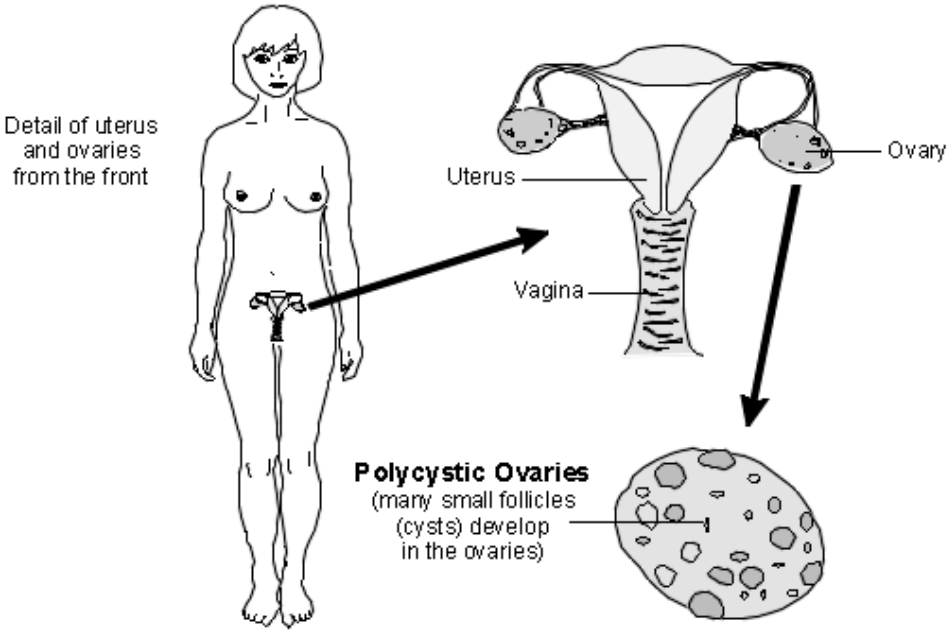
Polycystic ovary syndrome (PCOS)

Polycystic ovary syndrome (PCOS) is a metabolic condition related to a hormonal imbalance, that can cause symptoms of weight gain, excess hair growth, problems with periods and can impact infertility.



What is PCOS?

Polycystic ovary syndrome (PCOS) is a condition which has previously been thought to be gynaecological (associated with women's reproductive health), but is now understood to be mainly metabolic (associated with the way that the body handles insulin and other hormones).

Genetic factors and obesity cause insulin resistance (changes in the way that the organs in the body respond to the hormone insulin) - this increases the levels of insulin in the body, which causes the following changes in the female hormones:

- Overproduction of luteinising hormone (LH) prevents the rapid increase in LH mid-way through the menstrual cycle, which is necessary for ovulation. This means that an egg is not made every month, causing a reduction in fertility.
- The increase in LH causes the ovaries to preferentially make testosterone (the male hormone) rather than oestrogen (the female hormone).
- Hormone changes stop eggs from fully developing in the ovary and therefore reduce ovulation (making an egg each month).

How common is PCOS?

PCOS is common. It is difficult to know exactly how common, as figures vary depending on the definitions used and the countries studied.

Research studies of women who had an ultrasound scan of their ovaries found that up to a third of young women have polycystic ovaries (ie ovaries with many small cysts). However, many of these women were healthy, ovulated normally and did not have high levels of male chemicals (hormones). Having polycystic ovaries does not mean that you have polycystic ovary **syndrome.**

It is thought that around 1 in 10 women have PCOS (at least two of: polycystic ovaries, raised male hormone levels, reduced ovulation). However, the true figure may be higher, possibly up to 1 in 4 women, because some women with mild symptoms do not seek any assessment or treatment.

See the separate feature 8 common myths about PCOS for more details.

"*It is important that healthcare professionals are aware of the full range of signs of symptoms of PCOS and ensure that appropriate attention is given both to their management and their impact on an individual's mental health.*"

Source: Professor Adam Balen

PCOS symptoms

- Period problems occur in about 7 in 10 women with PCOS. You may have irregular or light periods, or no periods at all.
- Fertility problems - you need to ovulate to become pregnant. You may not ovulate each month. Some women with PCOS do not ovulate at all. PCOS is one of the most common causes of not being able to get pregnant (infertility).
- **Excess hair growth (hirsutism)** occurs in more than half of women with PCOS. It is mainly on the face, lower tummy (abdomen) and chest. In other words, it tends to be male-pattern hair. This does not happen to all women with PCOS.
- Acne may persist beyond the normal teenage years.
- Thinning of scalp hair (similar to male pattern baldness) occurs in some cases.
- **Weight gain** - women with PCOS are more at risk of becoming overweight or having obesity.
- Depression or poor self-esteem may develop as a result of the other symptoms.

Symptoms typically begin in the late teens or early 20s. Not all symptoms occur in all women with PCOS. For example, some women with PCOS have some excess hair growth but have normal periods and fertility. Some may have irregular periods or no periods, but have no other symptoms.

Symptoms of PCOS can vary from mild to severe. For example, mild unwanted hair is normal, and it can be difficult to say when it becomes abnormal in women with mild PCOS. At the other extreme, women with severe PCOS can have marked hair growth, infertility and obesity.

Symptoms may also change over the years. For example, acne may become less of a problem in middle age but hair growth may become more noticeable.

What causes PCOS?

The cause of PCOS as far as we understand it is explained in the section 'What causes PCOS'. It is a condition that isn't yet fully understood. PCOS does not have a clear pattern of inheritance as is the case for some other conditions, but it may run in families.

Whilst many women with PCOS have obesity, this is not the case for everyone, and some may have insulin resistance without having obesity. However, it is definitely the case that for anyone with PCOS who also has obesity, losing weight will be beneficial and may make ovulation more likely.

Are any tests needed to diagnose PCOS?

Tests may be advised to clarify the diagnosis and to rule out other hormone conditions.

- Blood tests may be taken to measure certain chemicals (hormones). For example, a test to measure the male hormone testosterone and luteinising hormone (LH) which tend to be high in women with PCOS.
- An ultrasound scan of the ovaries. An ultrasound scan is a painless test that uses sound waves to create images of structures in the body. The scan can detect the typical appearance of PCOS with the many small cysts (follicles) in slightly enlarged ovaries.

The condition is diagnosed when a person has at least two of the following :

- At least 12 tiny cysts (follicles) develop in your ovaries. (Polycystic means many cysts.)
- The balance of hormones that you make in the ovaries is altered. In particular, your ovaries make more than normal of the male hormone testosterone.
- You do not ovulate each month. Some women do not ovulate at all. In PCOS, although the ovaries usually have many follicles, they do not develop fully and so ovulation often does not occur. If you do not ovulate then you may not have a period.

Screening for diabetes or non-diabetic hyperglycaemia (NDH, also known as pre-diabetes)

You may be advised to have an annual screening test for diabetes or non-diabetic hyperglycaemia, also known as pre-diabetes or impaired glucose tolerance. A regular check for other cardiovascular (heart disease) risk factors such as blood pressure and blood cholesterol, may be advised to detect any abnormalities as early as possible.

Exactly when and how often the checks are done depends on your age, your weight and other factors. After the age of 40, these tests are usually recommended every five years, or more often if an abnormality is found.

PCOS treatment

There is no cure for PCOS. However, symptoms can be treated and your health risks can be reduced.

Losing weight and taking exercise

Losing weight helps to reduce the high insulin level that occurs in PCOS. This has a knock-on effect of reversing some of the hormone changes associated with PCOS, and improving the chance of you ovulating. Periods will then be more likely to be regular and fertility will improve. Hair growth and acne may also resolve or improve and the increased risks of long-term problems such as diabetes, high blood pressure, etc, are reduced.

Losing weight can be difficult. Whilst it would seem obvious that 'eat less and move more' will result in weight loss, obesity is more complex than that, involving long-term changes in the hormones which affect hunger and the feeling of fullness. Exercise has also been shown to help with PCOS, probably by increasing sensitivity to insulin.

Advice from a dietician may increase your chance of losing weight, or you could be referred to a weight loss clinic for consideration of medication (such as orlistat or injections of medications known as GLP1 agonists) or surgery to help with weight loss. Access to these clinics on the NHS varies significantly by area.

Even a moderate amount of weight loss can help - losing 10% of your body weight has a significant chance of helping you to ovulate and so increasing your fertility.

The best foods for someone with PCOS to eat are likely to be those which are slowly absorbed keeping blood sugar levels steady. These are said to have a low glycaemic index (low GI).

This means avoiding white bread, pasta and rice, and choosing wholemeal alternatives, or avoiding bread, pasta and rice entirely Potatoes and sugary foods and drinks are also best avoided. Most fruit, vegetables, pulses and wholegrain foods are both healthy and have a low GI.

Treating hair growth

Hair growth is due to the increased level of the hormone testosterone. Unwanted hair can be removed by:

- Shaving.
- Waxing.
- Hair-removing creams.
- Electrolysis.
- Laser treatments.

These need repeating every now and then, although electrolysis and laser treatments may be more long-lasting (but are expensive and are often not available on the NHS).

There are also some medicines which may be helpful. A cream called eflornithine may be prescribed for removing unwanted facial hair. It works by counteracting a chemical (an enzyme) involved in making hair in the skin. Some research trials suggest that it can reduce unwanted hair growth, although this effect quickly wears off after stopping treatment.

Medicines taken by mouth can also treat hair growth. They work by reducing the amount of testosterone that you make, or by blocking its effect. Medicines used include:

- **Cyproterone acetate** - an anti-testosterone medicine. This is commonly combined with oestrogen as a special oral contraceptive pill called Dianette®. Dianette® is commonly prescribed to regulate periods, to help reduce hair growth, to reduce acne and as a good contraceptive.

- The combined oral contraceptive (COC) (a combination of ethinylestradiol and drospirenone) has been shown to help if Dianette® is not suitable.
- **Other anti-testosterone medicines** are sometimes advised by a specialist if the above treatments do not help.

All types of combined oral contraceptive pill, including Dianette and Yasmin, increase the risks of blood clots in the veins - they are unlikely to be suitable if your body mass index (BMI) is greater than 35, as the risk of blood clots will be considered to be too high. If your BMI is greater than 30 and you have other risk factors for blood clots then again this class of medicine may not be suitable for you.

Dianette and Yasmin were the first brands of these particular pills available in the UK, but other brands are now available - your GP may prescribe generically (using the names of the hormones rather than the brand) and so the brand that you are given may vary with each prescription. This is helpful if there are shortages of a particular brand as your pharmacist can just dispense a different one rather than going back to the GP for a new prescription.

Medicines taken by mouth to treat hair growth take 3-9 months to work fully. You need then to carry on taking them, otherwise hair growth will come back (recur). Removing hair by the methods above (shaving, etc) may be advised whilst waiting for a medicine to work.

Treating acne

The treatments used for acne in women with PCOS are no different to the usual treatments for acne. The combined oral contraceptive pills, especially Dianette®, often help to improve acne. See the separate leaflets called Acne and Acne treatments which covers topical treatments and antibiotic tablet treatment for acne.

Treating period problems

Some women who have no periods, or have infrequent periods, do not want any treatment for this. However, your risk of developing endometrial cancer (cancer of the womb/uterus) may be increased if you have no periods for a long time. Regular periods will prevent this possible increased risk to the uterus.

Therefore, some women with PCOS are advised to take the contraceptive pill, as it causes regular withdrawal bleeds similar to periods. If this is not suitable, another option is to take a progestogen hormone, such as medroxyprogesterone for several days every few months.

This will cause a monthly bleed like a period. Sometimes, a levonorgestrel intrauterine device (LNG-IUD), previously known as the intrauterine system (IUS), which releases small amounts of progestogen into the womb, preventing a build-up of the lining, can be used. If none of these methods is suitable, your specialist may arrange a regular ultrasound scan of your uterus to detect any problems early - this is not commonly done.

Fertility issues

Although fertility is often reduced, you still need contraception if you want to be sure of not getting pregnant. The chance of becoming pregnant depends on how often you ovulate. Some women with PCOS ovulate now and then, others not at all.

If you do not ovulate but want to become pregnant then fertility treatments may be recommended by a specialist and have a good chance of success. Tablets such as clomifene can cause you to ovulate.

But remember, you are much less likely to become pregnant if you have obesity. If you have obesity or overweight, losing weight is advised in addition to other fertility treatments; in many areas, fertility treatment is only offered under a certain BMI.

Metformin and other insulin-sensitising medicines

Metformin is a medicine that is commonly used to treat people with type 2 diabetes. It makes the body's cells more sensitive to insulin. This may result in a decrease in the blood level of insulin which may help to counteract the underlying cause of PCOS - see above.

The National Institute for Health and Care Excellence (NICE), in its clinical knowledge summary page, advises that metformin only be started after a specialist opinion for those with PCOS. However, in its guideline on reducing the risk of diabetes, NICE advises that metformin be considered for people whose blood sugar has got worse despite intensive lifestyle change, or if they cannot take part in intensive lifestyle change, particularly if their BMI is greater than 35. The PCOS guidance from the Royal College of Obstetricians and Gynaecologists says similar.

You might want to talk to your doctor if this applies to you. The European guidelines on PCOS say that metformin 'should be considered' in adults with PCOS and a BMI of 25 or more, if the decision to take it is shared between the doctor and the patient, but this it not currently common practice in the UK.

Possible long-term problems of polycystic ovary syndrome

If you have PCOS, over time you have an increased risk of:

- Developing type 2 diabetes.
- Developing diabetes in pregnancy.
- A high cholesterol level.
- High blood pressure.
- Being overweight, particularly around the tummy.

These problems in turn may also increase your risk of having a stroke and heart disease in later life. These increased health risks are due to the long-term insulin resistance.

A sleeping problem called sleep apnoea is also more common than average in women with PCOS.

Other possible problems in pregnancy include more chance of having premature babies or having high blood pressure in pregnancy (pre-eclampsia). There may be twice the risk of developing diabetes in pregnancy if you have PCOS so you would be checked for this regularly.

If you have no periods, or very infrequent periods, you *may* have a higher-than-average risk of developing cancer of the womb (uterus). However, the evidence for this is not conclusive and, if there is a risk, it is probably small and can be prevented.

Preventing long-term problems

A healthy lifestyle is important to help prevent the conditions listed above in 'Possible long-term problems of polycystic ovary syndrome (PCOS)'. For example, you should:

- Eat a healthy diet.
- Exercise regularly.
- Lose weight if you are overweight or have obesity.
- Not smoke.

Healthy lifestyle advice applies to everyone, whether they have PCOS or not. However, it is particularly important for women with PCOS, as they may have extra risk factors for health problems in later life. These risks are much reduced if you are not overweight and do not smoke.

Dr Hazell has an interest in women's health and has been involved in writing and reviewing educational materials on PCOS for a variety of organisations, including, but not limited to, the RCGP, the PCWHF and Cambridge University Press.

Further reading

- Fertility - Assessment and treatment for people with fertility problems; NICE Guidance (February 2013, updated September 2017)
- Long-term Consequences of Polycystic Ovary Syndrome; Royal College of Obstetricians and Gynaecologists (November 2014)
- Hirsutism; NICE CKS, July 2020 (UK access only)
- Lim SS, Hutchison SK, Van Ryswyk E, et al; Lifestyle changes in women with polycystic ovary syndrome. Cochrane Database Syst Rev. 2019 Mar 28;3:CD007506. doi: 10.1002/14651858.CD007506.pub4.

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- Teede HJ, Tay CT, Laven JJE, et al; Recommendations from the 2023 international evidence-based guideline for the assessment and management of polycystic ovary syndrome. Eur J Endocrinol. 2023 Aug 2;189(2):G43-G64. doi: 10.1093/ejendo/lvad096.
- PCOS Charity Verity

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