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Polycystic Ovary Syndrome

Polycystic ovary syndrome (PCOS) is common. It can cause period problems, reduced fertility, acne and excess hair growth. Many women with PCOS are also overweight. Treatment includes weight loss (if you are overweight) and lifestyle changes in addition to treating the individual symptoms. There are some long-term health problems which are more likely in women with PCOS, so a healthy lifestyle is particularly important to lower the chance of these problems.

Understanding ovaries and ovulation

The ovaries are a pair of glands that lie on either side of the womb (uterus). Each ovary is about the size of a large marble. The ovaries make eggs (ova) and various hormones. Hormones are chemicals that are made in one part of the body, pass into the bloodstream and have an effect on other parts of the body.

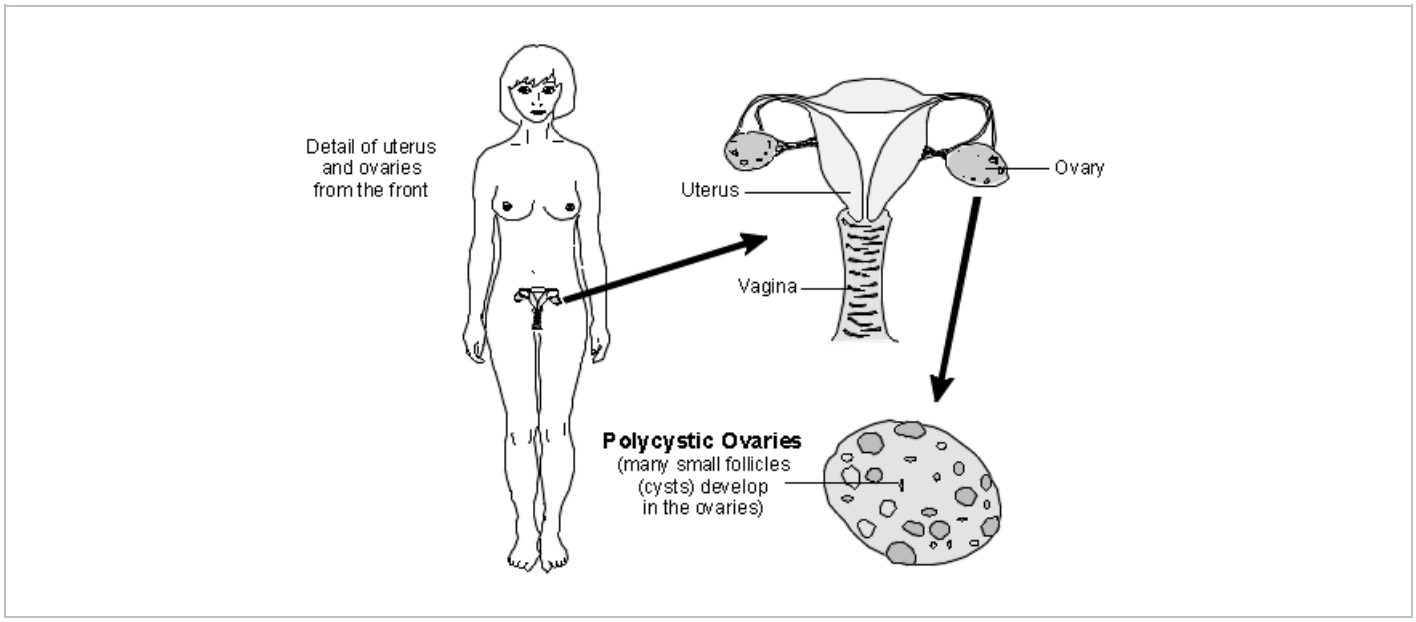
- Ovulation normally occurs once a month when you release an egg (ovum) into a Fallopian tube. The tube takes the egg into the uterus. Before an ovum is released at ovulation, it develops within a little swelling of the ovary, called a follicle. (A follicle is like a tiny cyst.) Each month several follicles start to develop but normally just one fully develops and goes on to ovulate.

- The main hormones that are made in the ovaries are oestrogen and progesterone - the main female hormones. These hormones help with the development of breasts and are the main controllers of the menstrual cycle. The ovaries also normally make small amounts of male hormones (androgens) such as testosterone.

What is polycystic ovary syndrome?

Polycystic ovary syndrome (PCOS), formerly known as the Stein-Leventhal syndrome, is a condition where at least two of the following occur and often all three:

- 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.



It is possible to have ovaries that are polycystic without having the typical symptoms that are in the syndrome. It is also possible to have PCOS without having multiple cysts in the ovary.

How common is polycystic ovary syndrome?

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).

It is thought that around 1 in 10 women have PCOS - that is, at least two of: polycystic ovaries, a raised level of male hormone, reduced ovulation. However, these figures may be higher.

> "*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 (https://patient.info/health/polycystic-ovary-syndrome-leaflet/features/how-pcos-affects-your-mental-health)

What causes polycystic ovary syndrome?

The exact cause is not totally clear. Several factors probably play a part. These include the following:

Insulin

Insulin is a chemical (hormone) that you make in a gland behind your stomach (the pancreas). The main role of insulin is to control your blood sugar level. Insulin acts mainly on fat and muscle cells, causing them to take in sugar (glucose) when your blood sugar level rises. Another effect of insulin is to act on the ovaries to cause them to produce the male hormone testosterone.

Women with PCOS have what is called insulin resistance. This means that cells in the body are resistant to the effect of a normal level of insulin. More insulin is then produced to keep the blood sugar normal. This raised level of insulin in the bloodstream is thought to be the main underlying reason why PCOS develops. It causes the ovaries to make too much testosterone. A high level of insulin and testosterone interfere with the normal development of follicles in the ovaries. As a result, many follicles tend to develop but often do not develop fully. This causes problems with ovulation - hence, period problems and reduced fertility.

It is this increased testosterone level in the blood that causes excess hair growth on the body and thinning of the scalp hair.

Increased insulin also contributes towards weight gain.

Luteinising hormone (LH)

This hormone is made in the pituitary gland, which is located in the base of the brain. It stimulates the ovaries to ovulate and works alongside insulin to promote testosterone production. A high level of LH is found in about 4 in 10 women with PCOS. A high LH level combined with a high insulin level means that the ovaries are likely to produce too much testosterone.

Hereditary factors

PCOS is not usually inherited from parents but it may run in some families. There seems to be a hereditary (genetic) factor involved in some cases but this is not yet understood.

Weight

Being overweight or obese is not the underlying cause of PCOS. However, if you are overweight or obese, excess fat can make insulin resistance worse. This may then cause the level of insulin to rise even further. High levels of insulin can contribute to further weight gain producing a 'vicious cycle'. Losing weight, although difficult, can help break this cycle.

What are the symptoms and problems of polycystic ovary syndrome?

Symptoms that occur if you do not ovulate

- **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).

Symptoms that can occur if you make too much male hormone testosterone

- **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.

Other symptoms

- **Weight gain** - women with PCOS are more at risk of becoming overweight or obese.
- **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.

Symptoms 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.

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 babies too early 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 (see below).

Are any tests needed?

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 polycystic ovary syndrome (PCOS).
- An ultrasound scan of the ovaries may be advised. 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.

Also, you may be advised to have an annual screening test for diabetes or impaired glucose tolerance (pre-diabetes). A regular check for other cardiovascular 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 three years.

What is the treatment for polycystic ovary syndrome?

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

You should aim to lose weight if you are overweight

Losing weight helps to reduce the high insulin level that occurs in PCOS. This has a knock-on effect of reducing the male chemical (hormone) called testosterone. This then improves the chance of you ovulating, which improves any period problems and fertility, and may also help to reduce hair growth and acne. The increased risks of long-term problems such as diabetes, high blood pressure, etc, are also reduced.

Losing weight can be difficult. A combination of eating less and exercising more is best. Advice from a dietician, and help and support from a practice nurse, may increase your chance of losing weight. Even a moderate amount of weight loss can help.

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. 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.

Occasionally tablets (such as orlistat) or operations for weight loss may be considered.

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 to rub on affected areas of skin. 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 pill Yasmin® (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.

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 separate leaflets called Acne, Topical Treatments For Acne and Antibiotic Tablets for Acne for more details.

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 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, an intrauterine system (IUS), which releases small amounts of progesterone into the womb, preventing a build-up of the lining, can be used. If none of these methods is suitable, your doctor may advise a regular ultrasound scan of your uterus to detect any problems early.

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 are obese. If you are obese or overweight then losing weight is advised in addition to other fertility treatments.

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. Other newer insulin-sensitising medicines include pioglitazone. This is not currently recommended for PCOS. For certain people with PCOS, a specialist may advise that metformin be taken. However, further research is needed to confirm the role of these medicines in the treatment of PCOS.

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 obese.
- 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.

Further reading & references

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