Polycystic Ovary Syndrome: What You Need to Know

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What causes PCOS?
Between 6% and 10% of reproductive-age women worldwide have polycystic ovary syndrome (PCOS).¹

There is a 95% chance that a woman with irregular menses dating to menarche, with associated acne and/or hirsutism, has PCOS.

The etiology is poorly understood and concepts have varied over the years. Present thinking claims increased local androgen production in the developing ovarian follicles leads to PCOS.²

The enhanced androgen production produces peripheral effects, such as:

- hirsutism,
- acne, and
- alopecia.

What are the signs?
Clinical findings vary depending on the response of the skin (differs from woman to woman and among ethnic groups). Increased thickness of the skin due to enhanced anabolic action of androgens usually still occurs, even in the absence of other features of hyperandrogenism.³

Constant, unopposed estrogen production results in chaotic menses that are:

Kelly’s Conundrum

Kelly, 23, presents with no menstrual periods for six months. She had normal pubertal development between ages 11 and 13, but her first period was not until age 16. From the onset, the periods were two to four months apart and arrived without warning.

She has mostly been at ideal body weight, but gained 9 kg in the last year due to sedentary activity. Teenage acne never disappeared. By age 17, she had onset of dark, coarse hair over her lip and chin, her upper and lower abdomen, between her breasts, and down her inner thighs. Kelly denies any breast discharge or hot flashes.

Constant, unopposed estrogen production results in chaotic menses that are:

Kelly’s mother has Type 2 diabetes treated with diet alone and her father had a coronary angioplasty at age 57. She has two sisters, one with irregular cycles and one with regular cycles.

On examination, Kelly looks healthy. Exam results are listed below:

- Blood pressure 136/80 mmHg
- Skin over fingers has increased thickness for a reproductive-age woman (2.6 mm)
- No proximal muscle weakness or other signs of Cushing’s syndrome
- Midline hirsutism of 14 (Ferriman-Gallwey score)
- No signs of virilization
- Roughening of the skin with increased pigmentation over the back of her neck
- No breast discharge (she is clinically euthyroid and there are no signs of a pituitary mass)

For more on Kelly, go to page 68.
Hyperandrogenism alone can result in most features of PCOS (Table 1), but all of this is aggravated by the concomitant presence of insulin resistance.

Insulin resistance in PCOS occurs two to three times more often than in the normal population and is inherited as a second abnormality. There is often a positive family history. Because insulin resistance compared to weight-matched women is identifiable in 60% of cases, it is an aggravating factor in women who already have PCOS and cannot be the causative factor by itself.

With insulin resistance, enhanced ovarian androgen production occurs, which magnifies the abnormality of existing PCOS. Thus, women with PCOS may not manifest clinical features until insulin resistance is overt (as with weight gain).

There may be concomitant, enhanced adrenal androgen secretion, in association with ovarian androgen secretion.

Table 2 lists some of the symptoms of PCOS and recommended treatments.
How is PCOS diagnosed?

Because 20% of women may have polycystic-appearing ovaries on ultrasound, of which one out of four will have PCOS, ultrasonography is not a specific test.

Biochemical measurements of androgens depend on the sensitivity and type of assay and are not sufficiently sensitive, or specific, for all cases. If there is clinical hyperandrogenism with acne, hirsutism, alopecia, and/or thickened skin, there is no reason to measure androgens unless the onset is recent and quite rapid and consideration of a rare androgen-secreting tumour is being contemplated.

In the absence of that clinical situation, measurement of serum androgens do not add to the clinical findings. On the other hand, a woman may have features of PCOS without signs of hyperandrogenism and, in that context, measurement of androgens may contribute to the diagnosis. In such a case, serum-free testosterone or free androgen index are the best tests to eliminate changes of sex hormone-binding globulin. The vast majority of women with clinical PCOS do not need androgen measurements, and ominous underlying causes are rare.4

Clinical diagnosis of PCOS is recommended. This diagnosis consists of chronic estrogenized anovulation with hyperandrogenism and exclusion of other causes4, including:

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**Table 2**

**Typical patient case scenarios**

**Menstrual abnormalities**
- Too frequent, too infrequent, totally chaotic, or heavily prolonged bleeding
- May treat with regular progestin-induced bleeds, (one, two, or three months apart) or the birth control pill.

**Hyperandrogenism**
- Features of hirsutism, acne, and alopecia
- May respond to antiandrogen alone (spironolactone, flutamide), or in conjunction with the birth control pill, (spironolactone, cyproterone, or flutamide)
- Spironolactone and flutamide are used daily; cyproterone is taken for the first 10 days of each package of birth control pills
- Antiandrogen plus ovarian suppression with the birth control pill gives faster stabilization and regression of hirsutism and acne than either one alone.

**Infertility**
- Investigate through semen analysis, tubal patency if clinically indicated, and treatment of anovulation
- Clomiphene results in an ovulation in 75% of cases
- Addition of metformin to clomiphene may result in approximately 30% ovulatory rates among the clomiphene failures; the use of exogenous gonadotropins would result in a 99% ovulation rate

**Frustrated obese patients**
- Lifestyle modification is important for treatment and prevention of obesity and the metabolic syndrome

**Table 3**

**Criteria for metabolic syndrome: ATP III**

Any three of the following:
- Abdominal obesity (men: waist >102 cm; women: > 88 cm)
- Low HDL cholesterol (men: < 1.04 mmol/L; women: < 1.29 mmol/L)
- Elevated triglycerides (> 1.7 mmol/L)
- Elevated blood pressure (> 130/85 mmHg)
- High fasting glucose (> 6.1 mmol/L)

HDL: High-density lipoprotein

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Between 6% and 10% of reproductive-age women worldwide have polycystic ovary syndrome.
• Cushing’s syndrome,
• late-onset congenital adrenal hyperplasia,
• androgen-secreting tumours, if rapid in onset and progression, and
• other causes of oligomenorrhoea (hyperprolactinemia and premature ovarian failure).

What should family physicians be aware of?

PCOS is a common problem in reproductive-age women. It can present from adolescence to menopause.

The physician should recognize that a withdrawal bleed at least every three months is needed to prevent the theoretic increased risk of endometrial carcinoma.

Fertility may be normal or problematic. If subfertility does occur and results solely from anovulation, then ovulation induction results in a close to normal fertility rate.

An important concern is the associated metabolic abnormalities that may occur with the increased risk of the presence of insulin resistance. If a patient has the pattern of metabolic syndrome, all first-degree relatives, including males, are also of increased risk and should have similar screening performed (Table 3).

All first-degree relatives of patients with metabolic syndrome are at increased risk, including males.

Not all women have insulin resistance, but increased fat increases the risk. Women with PCOS and insulin resistance also have a higher risk of:

• dyslipidemia,
• Type 2 diabetes,
• hypertension, and
• cardiovascular disease.

The role of insulin sensitizers is highly controversial. Metformin alone does not result in weight loss, but may be an adjunct to diet and exercise.

The only real role of metformin is for ovulation induction in women who have failed to respond to clomiphene alone.

When should the patient be referred?

PCOS can be managed by most family practitioners. Only the use of gonadotropins for ovulation requires referral to a specialist.

References