THE PATHCARE NEWS

POLYCYSTIC OVARY SYNDROME

What is Polycystic Ovary Syndrome?

Polycystic ovary syndrome (PCOS), is a common hormonal disorder among women of reproductive age, characterised by enlarged ovaries with cyst formation, ovulatory dysfunction, and/or elevated androgens. Although it is known that PCOS is an insulin resistant metabolic disorder, the root cause is unknown, with both genetic and environmental factors thought to be involved.

How common is PCOS?

PCOS is regarded as the most common endocrinopathy among women of reproductive age, with a prevalence of 8-13%. Up to 70% of women with PCOS remain undiagnosed.

What are some signs or symptoms of PCOS?

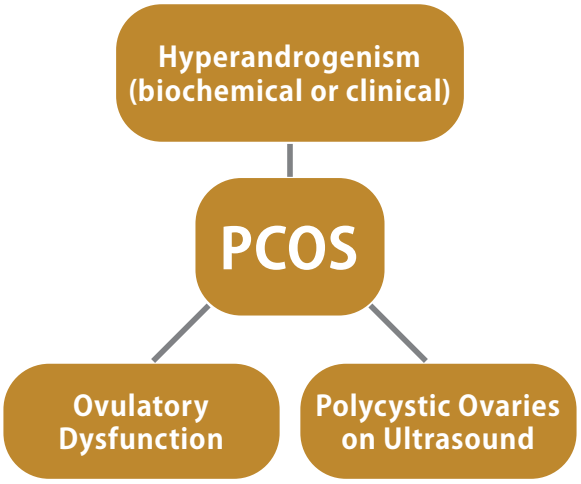
- Irregular or absent menstrual periods, which may affect fertility
- Increased androgenic hormones (biochemical hyperandrogenism) which may cause hirsutism, alopecia, and acne (clinical hyperandrogenism)
- Obesity, hypertension, type 2 diabetes mellitus, dyslipidaemia, fatty liver disease, sleep apnoea, depression, anxiety, and endometrial cancer can also be associated with PCOS.

What are the diagnostic criteria of PCOS?

First exclude conditions that may mimic PCOS:

- Thyroid disorders **(TSH, fT4)**
- Hyperprolactinaemia **(prolactin)**
- Primary ovarian insufficiency **(FSH, oestradiol)**
- Congenital adrenal hyperplasia **(17-hydroxyprogesterone and 11-deoxycortisol).**

Diagnosis is dependent on identifying any two of the following three features, according to the Rotterdam criteria:



Testing for insulin resistance is not recommended, however screening for diabetes mellitus is still advised (fasting plasma glucose, HbA1c or oral glucose tolerance test).

How is biochemical hyperandrogenism diagnosed?

Testosterone in circulation is found in three forms: (i) tightly bound to sex hormone binding globulin (SHBG), (ii) weakly bound to albumin and (iii) unbound as "free testosterone". As free testosterone is biologically active, it is the best marker for the diagnosis of hyperandrogenism. However, due to the extremely low concentration of free testosterone in circulation, especially in women and children, accurate direct measurement is not feasible for routine laboratories.

Measuring morning total testosterone and SHBG and applying a validated calculation, allows for the determination of the free androgen index (FAI), a measure of biologically active testosterone in females. The measurement of total testosterone can be done on either routine immunoassay, or liquid chromatography mass spectrometry (LCMS) methodology. However, due to inaccuracy at the low concentrations typically seen in women and children, various guidelines recommend using LCMS methodology rather than immunoassay for testosterone measurement in these groups. PathCare offers both immunoassay- and LCMS-based methods for testosterone testing. Testosterone is routinely measured by immunoassay, but LCMS-based testing can be requested by specifying "Testosterone by LCMS" on the request form.

If the FAI is elevated, the patient meets the criteria for biochemical hyperandrogenism. In cases where there is a strong clinical suspicion for PCOS but no elevation in the FAI is seen, testing of DHEAS and androstenedione can be considered to evaluate for the presence of biochemical hyperandrogenism.

What are the other causes of biochemical hyperandrogenism?

Although PCOS is the most common cause of hyperandrogenism in women, other causes include congenital adrenal hyperplasia, Cushing syndrome, adrenal and ovarian tumours, and medication (e.g., anabolic steroids and valproic acid).

How is PCOS managed?

Treatment should be individualised but, in general, in addition to lifestyle interventions, combined oral contraceptives (COC) are usually used as first line treatment for menstrual irregularity and hyperandrogenism. For the management of metabolic features, metformin is recommended either in addition to COC or alone. Treatment to consider for infertility include letrozole and clomiphene. Gonadotrophins and *in-vitro* fertilization are second- and third-line options for fertility.

In conclusion

PCOS is a common but treatable condition in women of reproductive age, and may present with symptoms of infertility, menstrual irregularity, hirsutism, alopecia, and/or acne. Diagnosis relies on confirming the presence two of the following: ovulatory dysfunction, polycystic ovaries on ultrasound and evidence of clinical or biochemical hyperandrogenism. The latter can be done by obtaining the FAI, ideally using an LCMS-based testosterone concentration and, where necessary, androstenedione and DHEAS concentrations.

References and additional information available on request

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