What is the best way to diagnose polycystic ovarian syndrome?

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EVIDENCE-BASED ANSWER

Polycystic ovarian syndrome (PCOS) is diagnosed for women of childbearing age presenting with 2 of the following: 1) oligo- or anovulatory menstrual irregularities, 2) evidence of hyperandrogenism in the absence of secondary cause; 3) enlarged ovaries with multiple small follicular cysts on transvaginal ultrasound (strength of recommendation [SOR]: **C**, based on expert opinion).

Depending on the clinical presentation, secondary causes should be excluded (**TABLE**) (SOR: **C**, expert opinion). While not among the diagnostic criteria, insulin resistance is common, and patients with PCOS should be evaluated for metabolic abnormalities, particularly hyperlipidemia and glucose intolerance or diabetes (SOR: **B**, based on prospective cohort studies).

CLINICAL COMMENTARY

Faty liver and insulin resistance are common problems in patients with PCOS
Today we have a better understanding of the relation between obesity, insulin resistance, and polycystic ovarian syndrome (PCOS), but it is not quite clear whether the insulin resistance plays the main pathophysiologic role in this condition. As the prevalence of obesity, metabolic syndrome, and diabetes increases in our society, it is expected that the incidence of PCOS will rise as well.

Unfortunately, there is no single specific diagnostic test available for the diagnosis of PCOS. I practice in a community clinic where access to pelvic ultrasound is limited, and often I have to rely on laboratory analysis to make the diagnosis. Aside from TSH, prolactin, DHEA sulfate, 17 OHP,

free testosterone, LH/FSH, and lipid panel, I calculate insulin resistance (IR) using fasting blood sugar and insulin level. If the IR level is elevated, I counsel the patient about PCOS and refer her to a dietitian for weight management while waiting for a pelvic ultrasonography appointment. However, due to multiple limitations that apply to the measurement of IR, experts in this field do not recommend its widespread use for the diagnosis of PCOS.

I also find that elevated ALT is not uncommon among my overweight patients who present with PCOS related symptoms. Further workup in this group of patients usually leads to the diagnosis of fatty infiltration of the liver.

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■ Evidence summary

Polycystic ovarian syndrome is a condition of unexplained hyperandrogenic chronic anovulation that affects at least 4% of women of reproductive age.[1] Because PCOS is a clinical syndrome, no single diagnostic criterion is sufficient for diagnosis.[2] Clinical features include menstrual irregularities or infertility, hirsutism, male-pattern balding, acne, ovarian enlargement, and signs of insulin resistance (eg, central obesity, acanthosis nigricans). A 2003 international consensus panel concluded that the presence of 2 of 3 criteria (oligo/anovulation, hyperandrogenism, polycystic ovaries), in the absence of other secondary causes, is sufficient to make the diagnosis.[2] Evidence for hyperandrogenism includes hirsutism, acne, or elevated total testosterone levels.[3] A high luteinizing hormone/follicle-stimulating hormone (LH/FSH) ratio supports the

TABLE

Differential diagnosis of hyperandrogenism in PCOS

DIFFERENTIAL DIAGNOSES	CLINICAL FEATURES	TEST
Nonclassical congenital adrenal hyperplasia	Family history; more common among Ashkenazi Jews	17-hydroxyprogesterone
Androgen-secreting neoplasms	Rapid virilization	DHEA-S (adrenal) Testosterone (ovary)
Hypothyroidism	Fatigue, dry skin, cold intolerance, weight gain, constipation, goiter	Thyroid-stimulating hormone
Hyperprolactinemia	Galactorrhea	Prolactin (may be mildly high in PCOS)
Cushing syndrome (rare)	Moon face, buffalo hump, abdominal striae, centripetal fat pattern, hypertension, easy bruising	24 hour urine free cortisol Dexamethasone suppression test (confirmatory)
Acromegaly	Acral enlargement, coarse features, prognathism	Insulin-like growth factor

Adapted from Chang, *Am J Obstet Gynecol* 2004.[6]

diagnosis. However, because this measure varies considerably in relation to ovulation, body-mass index (BMI), and the particular measurement assay used, the consensus panel recommended against its use as a diagnostic criterion.[2] Based on optimum receiver operator characteristic curve analyses, ultrasound criteria include the presence of 12 or more follicles in each ovary *measuring 2 to 9 mm in diameter* (sensitivity=75%, specificity=99%, positive predictive value [PPV]=75%, negative predictive value [NPV]= 99%, assuming 4% prevalence) or ovarian volume *over 7 mL* (sensitivity=67.5%, specificity= 91.2%, PPV=24%, NPV 99%).[4,5]

PCOS is also a diagnosis of exclusion. Secondary causes of hyperandrogenism may be suggested by clinical findings, including 1) abrupt onset, short duration, or sudden progressive worsening of hirsutism; 2) onset of symptoms in the third decade of life or later; or 3) signs of virilization (deepening voice, clitoromegaly).[6] The differential diagnosis, clinical features and potentially useful diagnostic tests to rule out secondary causes are shown in the **TABLE**.

Women with PCOS often experience insulin resistance, and are at increased risk for developing type 2 diabetes, dyslipidemia, and cardiovascular disease. One cross-sectional study[7] of 122 women with PCOS between 13.5 and 40 years of age found that 35% had impaired glucose tolerance, and another 10% had non-insulin-dependent diabetes. A prospective case-control study[8] of young women (aged <35 years) found that compared with age- and BMI-matched controls, those with PCOS had higher levels of fasting glucose, insulin, total and low-density lipoprotein cholesterol, and altered left ventricular mass and cardiac function on echocardiogram. Once PCOS is suspected, the diagnostic work-up should include a 2-hour glucose tolerance test and lipid panel to assess cardiovascular risk, particularly among obese women.

Recommendations from others

A 2002 American College of Obstetricians and Gynecologists guideline[9] adopted the 1990 National Institutes of Health consensus panel criteria for diagnosing PCOS (ie, chronic anovulation and clinical or biochemical signs of hyperandrogenism,

excluding other causes), and recommends that all patients have documentation of elevated testosterone levels; thyroid-stimulating hormone (TSH), prolactin, and 17-hydroxyprogesterone levels to exclude secondary causes of hyperandrogenism; and evaluation for metabolic abnormalities with a 2-hour glucose tolerance test and fasting lipid panel.

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