Polycystic ovary syndrome: A review for dermatologists

Part I. Diagnosis and manifestations

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Learning Objectives:
After completing this learning activity, participants should be able to describe the diagnostic criteria and appropriate laboratory work-up required to make the diagnosis of polycystic ovary syndrome (PCOS); identify women who are at risk for PCOS among their patients who present with acne, hirsutism, acanthosis nigricans, and/or androgenetic alopecia; have an understanding of the pathophysiology of PCOS; and describe the dermatologic, gynecologic, metabolic, and psychological manifestations of PCOS.

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Polycystic ovary syndrome (PCOS) is a common endocrine disorder among women who are of reproductive age. The pathogenesis involves several associated hormonal pathways that culminate in metabolic, reproductive, and cardiovascular effects. The hallmark features of hyperandrogenism and hyperinsulinemia have systemic long-term implications. Dermatologists frequently evaluate and manage the cutaneous manifestations of PCOS (ie, acanthosis nigricans, hirsutism, acne, and alopecia), and therefore play a key role in its diagnosis and management. In part I of this continuing medical education article, we review the definition, etiology, pathogenesis, and clinical features of PCOS. (J Am Acad Dermatol 2014;71:847.e1-10.)

Key words: acanthosis nigricans; acne; anovulation; hirsutism; hyperandrogenism; insulin resistance; polycystic ovary syndrome.

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age. This pervasive disorder of unknown etiology is characterized by 3 fundamental features: hyperandrogenism, chronic anovulation, and ultrasonographic evidence of polycystic ovaries. Women with PCOS are at risk for multisystemic consequences, including type 2 diabetes mellitus, cardiovascular disease, endometrial cancer, obstructive sleep apnea, nonalcoholic steatohepatitis, and psychiatric disorders. Clinicians involved in the care of women with PCOS should understand the potential health risks for these patients. Dermatologists are in a unique position to recognize the clinical manifestations of hyperandrogenism and insulin resistance and play an important role in the diagnosis and management of women with PCOS.

Abbreviations used:

BMI:	body mass index
DHEA:	dehydroepiandrosterone
DHEAS:	dehydroepiandrosterone sulfate
FSH:	follicle-stimulating hormone
GnRH:	gonadotropin-releasing hormone
IGF-1:	insulin-like growth factor 1
LH:	luteinizing hormone
OSA:	obstructive sleep apnea
PCOS:	polycystic ovary syndrome
SHBG:	sex-hormone binding globulin

DEFINITION

Key points

- **Polycystic ovary syndrome is a common endocrine disorder that affects up to 8% of women who are of reproductive age**
- **The 2003 Rotterdam criteria requires 2 out of 3 clinical indications to make the diagnosis of polycystic ovary syndrome, including oligo- or anovulation, clinical and/or biochemical signs of hyperandrogenism, and echographic polycystic ovaries**
- **Polycystic ovary syndrome is a diagnosis of exclusion; other etiologies of hyperandrogenism and anovulation must be ruled out**
- **The etiology remains unknown, but genetics along with early androgen exposure likely play a role**

In 1935, Drs Irving Stein and Michael Leventhal described a phenomenon in which 7 women had anovulation and polycystic ovaries discovered during surgery.[1] The condition was called Stein–Leventhal syndrome and was later renamed polycystic ovary syndrome (PCOS) to represent the unique morphology of the ovaries. Since its initial description, 2 main definitions of PCOS have emerged. The 1990 National Institutes of Health (NIH) definition requires the presence of oligo- or anovulation and biochemical or clinical signs of hyperandrogenism. Alternatively, the 2003 Rotterdam criteria broadens this definition and requires the presence of 2 out of 3 of the following clinical indications: oligo- or anovulation, biochemical or clinical signs of hyperandrogenism, and echographic polycystic ovaries (Table I).[2] Importantly, both definitions require the exclusion of other conditions that result in anovulation and hyperandrogenism, such as congenital adrenal hyperplasia, Cushing syndrome, and androgen-secreting tumors. These conditions can be excluded upon the evaluation of symptoms and relevant laboratory studies (Table II). The Rotterdam criteria

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