



Evidence-Based Management of Infertility in Women With Polycystic Ovary Syndrome

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a polygenic disorder with a variable phenotype that commonly affects women of reproductive age. It can significantly affect a woman's ability to conceive and her quality of life. Effective treatment includes a multidisciplinary team approach that addresses the physiological and psychosocial manifestations of the disorder. Nurses have an important role in promoting early detection, education, and identification of services and resources to improve a woman's fertility and lifelong health.

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Polycystic ovary syndrome (PCOS) is a common endocrine disorder and metabolic disturbance observed in 4% to 18% of women of reproductive age (March et al., 2010; Moran, Hutchinson, Norman, & Teede, 2011). Signs of the syndrome can present as early as puberty (Ehrmann, 2005; Franks, 2002). Women with PCOS experience absent or infrequent menses, infertility, acne, and excess hair growth, and ultrasound images show enlarged multicystic ovaries. Although the cause is uncertain, scholars have hypothesized that insulin resistance contributes to the development of PCOS and other chronic diseases such as cardiovascular disease, hypertension, metabolic syndrome, obesity, and type 2 diabetes mellitus (Dunaif, 1997; Steinberger & Daniels, 2003). Kahsar-Miller, Nixon, Boots, Go, and Azziz (2001) found that 24% to 32% of women with PCOS had a mother or sister with insulin resistance and symptoms of hyperandrogenism. However, the roles of inheritance, familial food preferences, and lifestyle patterns associated with the causes of this disorder remain unclear (Diamanti-Kandarakis & Piperi, 2005). The purpose of this article is to provide a brief overview of PCOS and the fertility challenges that women with PCOS encounter. In

addition, measures that nurses can take to improve reproductive, maternal, and neonatal outcomes are discussed.

Pathophysiology of PCOS

A disordered ovarian environment characterizes PCOS. In women with PCOS, ovarian follicles arrest in a state of preovulation. This state of arrest is caused primarily by an overabundance of androgens, which impedes follicle growth and ovulation. Current opinion suggests that insulin resistance is the culprit because it is observed in many women with PCOS (Dunaif, Segal, Futterweit, & Dobrjansky, 1989; Johnson, 2014). Insulin resistance causes an abnormal response in the ovary that results in an increase in the amount of circulating androgens that lead to hyperandrogenism (Fritz & Speroff, 2011). Figure 1 shows the overall pathophysiology of PCOS.

Diagnostic Criteria for PCOS

Because PCOS is a syndrome of ovarian dysfunction with a wide range of symptoms, diagnosis of this disorder can be challenging. No single symptom or blood test can diagnose this

The goal of infertility treatment in women with polycystic ovary syndrome is to generate and ovulate one mature follicle.

multifaceted disorder. Therefore, clinical awareness is important to facilitate early diagnosis and management. For years, the medical and scientific communities debated the diagnostic criteria for PCOS. Finally, at the Rotterdam conference of 2003, co-sponsored by the European Society for Human Reproduction and the American Society for Reproductive Medicine, the diagnostic criteria for PCOS (commonly known as the Rotterdam Criteria) were defined. At a minimum, a woman with PCOS must present with two of three key clinical features: (a) hyperandrogenism (clinical or serum evidence of elevated circulating male hormones), (b) cystic ovaries on ultrasound imaging, and (c) chronic oligoovulation or anovulation (infrequent or absent ovulation; [Rotterdam ESHRE/ASRM-Sponsored Polycystic Ovary Syndrome Consensus Workshop Group, 2004](#)).

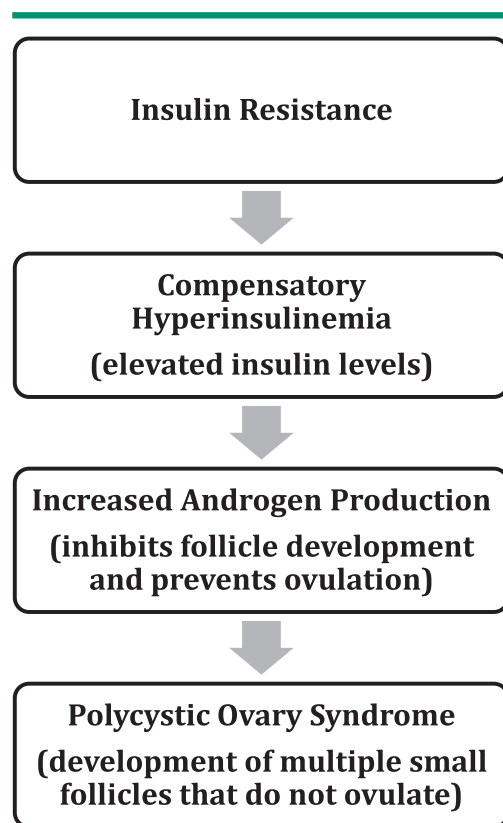


Figure 1. Pathophysiology of polycystic ovary syndrome.

Differential Diagnosis of PCOS

The clinical features of PCOS are similar to those of other disorders, and therefore diagnosis is made by exclusion. Nurses should be prepared to educate women about the diagnostic testing that will be ordered to exclude conditions that cause anovulation, such as hypothyroidism and hyperprolactinemia. If it is not clinically evident during the physical examination, tests for androgen levels such as testosterone assays are often required to confirm hyperandrogenism. In addition, referrals to clinicians specializing in reproductive endocrinology may trigger additional testing to rule out other etiologies such as Cushing's syndrome, hypothalamic amenorrhea, congenital adrenal hyperplasia, and androgen-secreting tumor. In general, the scope of testing reflects a woman's past medical and reproductive history and clinical findings.

Insulin Resistance

Insulin is a hormone that is essential for making glucose available for cellular metabolism. When muscle, fat, and liver cells become resistant to the action of insulin, the beta cells of the pancreas respond by pumping more and more insulin into the circulation to maintain glucose control. Higher levels of insulin can increase the production of androgens, such as dehydroepiandrosterone sulfate and testosterone, and interfere with the growth of ovary follicles. This compensatory hyperinsulinemia can be present for years without raising glucose levels. As androgen levels increase, ovarian dysfunction ensues, and hyperinsulinemia leads to weight gain and obesity. Obesity exacerbates the cardiometabolic consequences of PCOS and may result in fertility challenges. Excess weight contributes to increased time to conception, ovulatory dysfunction, lower implantation and pregnancy rates, higher miscarriage rates, and increased maternal and fetal complications ([American Dietetic Association, 2009](#); [Rich-Edwards et al., 1994](#); [van der Steeg et al., 2004](#); [Weiss et al., 2004](#)).

Evidence demonstrates that increased insulin resistance may also be present in lean women with PCOS ([Dunaif et al., 1989](#); [Stepito et al., 2013](#)). This syndrome correlates strongly with insulin resistance, which is a risk factor for type 2 diabetes mellitus in overweight and lean women. As such, recommendations include testing for glucose intolerance in women with newly diagnosed PCOS or those women not previously tested. In addition, many organizations, including

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