

# Prevalence of polycystic ovarian syndrome in the Buraimi region of Oman

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## ABSTRACT

**Introduction:** The aim of this study was to find out the prevalence and clinical features of polycystic ovarian syndrome (PCOS) among women of reproductive age group in the Buraimi Region of Oman.

**Materials and Methods:** A three-year retrospective study (01/1/2007-31/12/2009) at the Buraimi Hospital, Oman was retrospectively carried out. All women of reproductive age who were referred or presented to the Department of Obstetrics and Gynaecology of the Buraimi Hospital with clinical features of PCOS (menstrual irregularities, abnormal uterine bleeding, hirsutism, infertility) were included in this study. Ultra-sonogram reports of all these patients were reviewed. **Results:** There were a total of 3,560 patients included in the study. Of these, 251 patients were diagnosed to have PCOS giving a prevalence of 7%. Thirty-eight percent presented with infertility (primary or secondary) disorder and 85.3% presented with menstrual irregularities. Abnormal uterine bleeding was the most common presentation and was reported in 48.2%, followed by hirsutism (44%). Seventy-five patients (29.9%) had weight disorders. Type 2 diabetes mellitus or gestational diabetes were diagnosed in 13.9%. **Conclusion:** In conclusion, this hospital-based prevalence study PCOS among the women of reproductive age in the Buraimi region of Oman was 7%. Common presentations included menstrual irregularities, infertility, abnormal uterine bleeding and hirsutism.

**Keywords:** Anovulation, hyperandrogenism, infertility, insulin resistance, obesity, menstrual disorders

## INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common endocrinology disorder among women of reproductive age. <sup>1</sup> The 2003 Rotterdam Consensus Workshop defined PCOS

as a syndrome of ovarian dysfunction along with cardinal features of hyperandrogenism and polycystic ovary morphology <sup>2</sup> (*Refer to Supplementary Text for diagnostic definitions for PCOS*). Most published literature indicates prevalence rates of between 6% and 7% in the general female population. <sup>3, 4</sup>

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The underlying aetiology of PCOS is

complex and consists of interplay of many factors that include genetic and environmental factors leading to hormonal imbalance resulting in clinical manifestations. Genetic studies have shown autosomal dominant mode of inheritance of PCOS, suggesting that 50% of females within a family may manifest this disorder. However, the actual clinical expression is less (20-40%) due to modification by both genetic and environmental factors.<sup>5, 6</sup>

Given that PCOS is a clinical syndrome, there is no single diagnostic criterion (i.e. hyperandrogenism or polycystic ovary) that is sufficient for clinical diagnosis. Diagnosis requires the presence of certain clinical manifestations and these include menstrual irregularities, features of androgen excess (hirsutism and acne), obesity and findings of polycystic ovaries on imaging. PCOS is also associated with increased risk of impaired glucose tolerance, type 2 diabetes mellitus, hypertension, hyperlipidemia, non-alcoholic fatty liver disease, cardiovascular disorders and endometrial carcinoma. Most of these disorders are part of the metabolic syndrome. Therefore, it is not surprising that PCOS is closely related to overweight and obesity. Hence with the increasing prevalence of obesity, the prevalence of PCOS is also likely to increase.<sup>7</sup>

Currently, most of the published data on PCOS among the Middle Eastern population have been from the Islamic Republic of Iran and there is very little data on the other Middle Eastern populations. This study assessed the prevalence of PCOS and its associated clinical features among women of reproductive age from the Buraimi Region of the Sultanate of Oman.

**Table 1: Criteria for diagnosis of PCOS.**

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- Polycystic ovaries (either 12 or more peripheral follicles or increased ovarian volume (greater than 10cm<sup>3</sup>))
  - Oligo- or anovulation
  - Clinical and /or biochemical signs of hyperandrogenism
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## MATERIALS AND METHODS

**Patients:** All patients of reproductive age who presented or referred to the Obstetrics and Gynaecology department of Buraimi Hospital with clinical features suggestive of PCOS (menstrual irregularities, abnormal uterine bleeding, hirsutism, infertility) were included in this study. A search through the hospital computer record system was carried from 1<sup>st</sup> January 2007 to 31<sup>st</sup> December 2009 (three years). Ultrasonogram reports of all patients were carefully reviewed. Distribution of the various clinical features among the 251 patients was analysed.

**Definitions:** In this study, PCOS was defined by the presence of ovulatory dysfunction: i) history of eight or fewer menstrual cycles in a year or, ii) menstrual cycles less than 26 days or more than 35 days in length or, iii) day 21-day 24 (mid-luteal progesterone level of less than 4ng/ml in subjects with cycles 26-35 days in length and iv) clinical hyperandrogenism (e.g. hirsutism and acne) and or hyperandrogenemia. Two out of the three following criteria should be present for the diagnosis of PCOS (Table 1). Diagnosis of PCOS can only be made after other aetiologies such as thyroid dysfunction, congenital adrenal hyperplasia, hyperprolactinemia, androgen secreting tumours and Cushing syndrome have been excluded.<sup>8</sup>

## RESULTS

There were a total of 3,560 patients included in the study. Of these, 251 patients were diagnosed to have PCOS based on the definition giving a prevalence of 7%.

Ninety-five patients (37.8%) presented with fertility problems either primary or secondary. Two-hundred and seventeen patients (85.3%) presented with menstrual irregularities (amenorrhoea or oligomenorrhoea). Abnormal uterine bleeding was reported by 121 patients (48.2%). Hirsutism was noted in 111 patients (44%). Seventy-five patients (29.9%) had weight disorders (considered obese; weight >80kg). Type 2 diabetes mellitus or gestational diabetes were diagnosed in 35 patients (13.9%).

## DISCUSSION

PCOS is the most common endocrine disorder affecting females of reproductive age (12 to 45 years). The main underlying abnormality in PCOS is the excess of LH resulting in all the downstream manifestations.<sup>9</sup> This is also associated with insulin resistance that is secondary to a post-binding defect in the insulin signaling pathway. The secondary insulin excess in turn stimulates the production of LH and ovarian androgens creating a cycle of stimulation.<sup>10</sup> It also inhibits hepatic synthesis of sex hormone binding globulin and insulin-like growth factor binding protein-1.<sup>9</sup>

PCOS is a complex hormonal disorder and results in symptoms in 5 to 10% of affected women. In this retrospective study with a sample of 3,560 women of reproductive age, the estimated prevalence of PCOS was 7%, a rate that is compatible to those reported in studies from the United States,

United Kingdom, Greece, and Spain.<sup>3, 4, 11, 12</sup>

The principal features of PCOS are polycystic ovaries with ovulation abnormalities, excess LH resulting in masculinising effects (acne and hirsutism) and insulin resistance. The symptoms and severity vary greatly among affected women. Polycystic ovary may not necessarily be present or detected at the time of evaluation in patients suspected to have PCOS. Furthermore, not all women diagnosed with PCOS demonstrate the clinical and biochemical features which define the syndrome of PCOS. This may become apparent later in time. Therefore, there is considerable heterogeneity of symptoms and signs between individuals and within an individual, features may change over time.<sup>13</sup>

PCOS is the most common cause of fertility disorders. In our study, 37.8% of patients presented with primary or secondary fertility problems. This is comparable to one of the largest published series of 1,871 women with PCOS, 26% presented with primary infertility whereas 14% presented with secondary infertility.<sup>14</sup> Among the manifestations, menstrual irregularities were the most common (85.3%), followed by abnormal uterine bleeding, hirsutism, overweight or obesity. Reported prevalence of hirsutism in PCOS ranges from 40% to 90% among European and American women. It is common in darker skin types, and rare in Japanese and oriental females. Diabetes mellitus, including gestational type was also common. Prevalence of glucose intolerance and subsequent diabetes has been reported to be as high as 31% and 7.5%, respectively.<sup>15</sup>

Several clinical conditions associated

with PCOS are due to downstream effects of hormonal imbalance. The effect on the insulin pathway accounts for the higher incidence of impaired glucose problem and diabetes mellitus in patients with PCOS. Apart from this, several other conditions often related to metabolic alterations, such as dyslipidemia, hypertension, endothelial dysfunction, low grade chronic inflammation are present even at a younger age in patients with PCOS.<sup>16</sup> Obesity and obstructive sleep apnoea are also common.<sup>8, 12</sup> Given the association with metabolic dysfunction, it is not surprising that conditions associated with metabolic syndromes are also commonly seen in patients with PCOS. The incidence is reported to be increasing, paralleling the increase in the prevalence of obesity.

Management of PCOS is symptom oriented.<sup>16</sup> Several studies have shown that weight loss in women with PCOS improves the endocrine profile, menstrual cycle, rate of ovulation and likelihood of healthy pregnancy. Even a modest loss of between five and 10% of the total body weight can achieve a 30% reduction of central fat, an improvement in insulin sensitivity and restore ovulation. Lifestyle modification is clearly a key component for the improvement of reproductive function for overweight anovulatory women with PCOS.<sup>7</sup> Overall, this will also address the cardiovascular related risk factors. Apart from this, it is also important to regulate the menstrual cycle and allow menstruation as prolonged periods of oligomenorrhoea or amenorrhoea in women with PCOS may predispose to endometrial hyperplasia and later endometrial carcinoma. It is good practice to recommend treatment with progestogens to induce a withdrawal bleed at least every three to

four months. There does not appear to be an association with breast or ovarian cancer and no additional surveillance is required.<sup>8</sup>

In conclusion, this hospital-based prevalence study PCOS among the women of reproductive age in the Buraimi region of Oman was 7%, comparable to findings from other parts of the world. Counseling and creating awareness among these women to adopt life style modification (regular exercise, dietary advice, maintaining optimum weight) and regular health screening is mandatory to reduce the impact on their overall health.

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