

All Wales Clinical Biochemistry Audit Group

Standards for Laboratory Investigation of Polycystic Ovary Syndrome (PCOS)

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a heterogeneous disorder, whose clinical features include menstrual irregularity, hirsutism, sub-fertility and acne. Insulin resistance is now recognised as an integral component, particularly in obese women. PCOS is primarily a diagnosis of exclusion in which biochemical tests have a key role, but are not diagnostic, and are principally used to help to exclude other diseases with similar clinical features.

Revised diagnostic criteria for PCOS were agreed by international consensus¹ in 2003. At least 2 of the following 3 criteria must be present:

1. Reduced or absent ovulation
2. Clinical and/or biochemical signs of hyperandrogenism
3. Polycystic ovaries

Other aetiologies (e.g. androgen-secreting tumours, congenital adrenal hyperplasia, Cushing's syndrome) should have been excluded.

Patients with PCOS present with a variety of symptoms to many different clinicians, including primary care physicians, gynaecologists, dermatologists and endocrinologists. It is therefore important that the laboratory provides a basic minimum level of diagnostic support. A recent survey of investigations for PCOS undertaken by Welsh laboratories, presented at an audit meeting in November 2003, showed wide variations in practice. The following core standards are recommended in the light of the survey findings, discussion at this meeting and subsequent consultation.

STANDARDS

1. It is recommended that a protocol is agreed locally in consultation with relevant clinicians.
2. If PCOS is suspected, blood should be taken for the following (serum) tests as a minimum: LH, FSH, testosterone and sex hormone binding globulin (SHBG).
3. In women with amenorrhoea, the specimen may be taken at any time; otherwise an early follicular phase sample is recommended. Patients should not be taking the oral contraceptive pill or other oestrogen therapy.
4. Test results which may be regarded as "suggestive of PCOS" include a raised LH/FSH ratio (which is method dependent²), a raised testosterone and/or decreased SHBG.
5. A derived index of free androgen status may be used to aid interpretation, but should not be quoted on reports unless it has been validated for the specific assays in use.
6. An extracted testosterone assay should be available to confirm raised (or unexpectedly low) testosterone results. It is strongly recommended that testosterone results over 5 nmol/L should be confirmed by an extraction assay.
7. As current direct immunoassays for testosterone in females have poor accuracy, it is not possible to provide absolute "trigger" values for further testing. However, there is a significant risk of serious pathology when the testosterone concentration exceeds 5 nmol/L,³ so such patients should have measurements of androstenedione, DHEAS and 17-hydroxyprogesterone.
8. Further testing of women with a moderately raised testosterone concentration (3-5 nmol/L) should be agreed locally.
9. Fasting plasma glucose should be measured in all women diagnosed with PCOS.⁴ It is recommended that women with PCOS whose body mass index (BMI) exceeds 27 Kg/m² should have an oral glucose tolerance test¹ (unless the fasting plasma glucose is diagnostic of diabetes). Women with PCOS who become pregnant should be screened for gestational diabetes in early pregnancy.⁴
10. A fasting lipid profile should be measured in women diagnosed with PCOS.^{3,4}

ACKNOWLEDGEMENTS

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References

1. The Rotterdam ESHRE/ASRM-sponsored PCOS consensus workshop group. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome (PCOS). *Hum Reprod* 2004; **19**: 41-47.
2. Milsom SR, Sowter MC, Carter MA, Knox BS, Gunn AJ. LH levels in women with polycystic ovarian syndrome: have modern assays made them irrelevant? *BJOG* 2003; **110**: 760-764.
3. Franks S. Polycystic Ovary Syndrome (review article). *NEJM* 1995; **333**: 853-861.
4. Royal College of Obstetricians & Gynaecologists. Guideline No. 33: Long-term consequences of polycystic ovary syndrome. May 2003.

VERSION: Version 1

DATE: 29th November 2005.

APPENDIX **Calendar of audit process for standards for laboratory investigation of PCOS**

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| Nov. 2003 | Findings of a survey of 13 Welsh biochemistry laboratories on the tests used for investigating PCOS, undertaken by Mr RG Roberts (Aberystwyth), presented at an All Wales Clinical Biochemistry Audit Group meeting in Cardiff. |
| Nov. 2004 | Initial draft standards prepared by Mr RG Roberts, considered at an All Wales Clinical Biochemistry Audit Group committee meeting and presented at an audit meeting held in Llandrindod Wells. |
| April 2005 | Further draft of standards prepared and sent for consultation to clinical biochemists, gynaecologists and endocrinologists in Wales, to seek their views. |
| Nov 2005 | Version 1 of standards finalized. |