All Wales Clinical Biochemistry Audit Group

Standards for the Performance and Interpretation of the Short Synacthen (tetracosactide) Test in investigating suspected Adrenocortical Insufficiency

INTRODUCTION

Synacthen (tetracosactide) is an analogue of corticotropin (ACTH) used to test adrenal function; an inadequate increase in serum cortisol concentration after injecting Synacthen indicates adrenocortical insufficiency. A recent survey of 13 Welsh laboratories, presented at an audit meeting in November 2004, showed wide differences in protocols for both performing and interpreting the short Synacthen test in general medical patients. The following core standards are recommended in the light of the survey findings, discussion at this meeting and subsequent consultation. [The audit did not specifically survey use of the test in the Intensive Care Unit setting, where practice may be different.]

STANDARDS

1. Choice of Test

The short Synacthen test is recommended as the preferred screening test for investigating suspected adrenocortical insufficiency. Random serum cortisol measurement is generally not recommended, although in certain clinical settings it may be diagnostic (e.g. hypoglycaemia).

2. Availability of Written Protocol

Each laboratory should have a policy for performance and interpretation of the short Synacthen test, which has been agreed with local endocrinologists.

3. Patient Preparation

a) It is essential that the extent of cross-reaction of therapeutic steroids in the serum cortisol assay is known. For patients receiving therapy with a steroid that is known to cross-react, it is recommended that this therapy is substituted with an alternative steroid (e.g. betamethasone or dexamethasone) at an equivalent dose (see BNF section 6.3.2) at least 3 days before the test.

b) The patient does not need to fast.

4. Procedure

a) It is recommended that the test is carried out in the morning, between 9 am and 10 am, where practicable, as responses will decline later in the day.

b) The test should be carried out where suitable resuscitation facilities are available, as there is a risk of anaphylaxis, particularly if the patient has a history of asthma.

c) For adults, the recommended standard Synacthen dose is 250 µg. The recommended dose in children is 250 µg/1.73m^2 body surface area (consult standard tables to determine exact dose).

d) The Synacthen may be administered by either intramuscular or intravenous injection.

e) Blood samples should be taken at 0 minutes (before the injection) and at 30 minutes for measurement of serum cortisol. It is recommended that a basal blood sample is also collected for ACTH and stored, pending the result of the short Synacthen test.

5. Cortisol Assay Service

a) It is recommended that each laboratory providing services for an acute hospital should be able to provide serum cortisol results for a short Synacthen test within 1 working day on request.

b) Each laboratory providing “in house” cortisol assays should undertake appropriate internal quality control (IQC) procedures and participate in an accredited external quality assurance (EQA) scheme. It is recommended that one of the IQC materials used has a cortisol concentration close to the diagnostic cut-off level used in the short Synacthen test.

6. Reference Range and Interepretation

a) For a normal response, the serum cortisol concentration should be at least 550 nmol/l at 30 minutes following the injection of Synacthen. The increment in cortisol concentration after Synacthen is an unreliable index of adrenal function, but may occasionally merit consideration.

b) As many serum cortisol immunoassays exhibit bias, as demonstrated by EQA, this value may need to be adjusted to account for the current local assay bias.

c) An interpretative comment should be included with each short Synacthen test report.

7. Further Action if the Result is Abnormal

a) It is recommended that the result of each short Synacthen test that shows an inadequate response should be telephoned as soon as possible to the requesting clinician.

b) It is recommended that the clinician is advised to consider:
- repeating the test in the morning if originally performed in the afternoon;
- referral to an endocrinologist for further investigations;
- measurement of adrenal antibodies (and very long chain fatty acids in male patients) if primary adrenocortical insufficiency is suspected.

ACKNOWLEDGEMENTS

Dr. M. Giles and Dr. G. Curtis.

REFERENCES

1. Wood PJ. Short Synacthen tests: the need for rationalization. Clin Endocrinol 1998; **49**: 282-3.

2. Clark PM, Neylon I, Raggatt PR, Sheppard MC, Stewart PM. Defining the normal cortisol response to the short Synacthen test: implications for the investigation of hypothalamic-pituitary disorders. Clin Endocrinol 1998; **49**: 287-292.

3. Barth JH, Seth J, Howlett TA, Freedman DB. A survey of endocrine function testing by clinical biochemistry laboratories in the UK. Ann Clin Biochem 1995; **32**: 442-449.

4. Hypothalamic-pituitary-adrenal function tests. CIBA Laboratories 1976.

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APPENDIX Calendar of audit process for Standards for the Short Synacthen Test

Nov. 2004 Findings of a survey of 13 Welsh biochemistry laboratories, undertaken by Dr M Giles and Dr G Curtis (Ysbyty Glan Clwyd, Bodelwyddan), presented at an All Wales Clinical Biochemistry Audit Group meeting in Llandrindod Wells.

April 2005 Initial draft standards presented by Dr G Curtis at an audit meeting held in Newport.

May 2005 Written draft standards prepared and sent for consultation to clinical biochemists and endocrinologists in Wales, to seek their views.

Nov 2005 Final draft of standard presented by Dr M Giles at an audit meeting held in Llandudno. Version 1 of standards finalised.