Information for Clinicians

Clinical Biochemistry Department

Short Synacthen Test (SST) for suspected adrenal insufficiency

Indication:

Short synacthen test (SST) is performed for the investigation of suspected adrenal insufficiency. Synacthen (tetracosactrin) is a synthetic ACTH analogue which should stimulate the production of cortisol from the adrenal cortex.

Contra-indications:

- A baseline 9am cortisol of >300nmol/L excludes adrenal insufficiency and SST not required.
- Patients with severe atopic allergic disorders or previous hypersensitivity to synthetic ACTH should avoid SST.
- Avoid in pregnancy.

Precautions:

- If adrenal insufficiency is strongly suspected or cortisol <100 nmol/L, treatment should not be withheld pending a SST.
- Hypersensitivity reactions to Synacthen have been reported. Local or systemic reactions tend to occur within 30 min of injection; therefore the patient must be kept under observation for this time.
- Avoid in ITU or severely unwell patients, discuss with endocrinology if hypoadrenalism is suspected.

Preparation:

- Perform test in the morning (ideally 9am).
- Request short synacthen test profile on Millennium (within Trust) or ICE (within community)
- Long term steroids (e.g. hydrocortisone or prednisolone) need to be stopped 24 hours prior to test. **The day before the test the patient may take their usual morning dose but must omit lunchtime and evening doses**. **On the day of the test the patient must omit their morning steroid dose.** The patient must bring their morning medication with them to take after the last blood test and the SST has been completed.

Procedure:

1. Take serum for **basal cortisol** (yellow top). Clearly label the sample with patient details, the actual time of collection and “time=0min” or “baseline sample”

2. If SST is being performed at RUH, collect EDTA plasma sample (purple top) **on ice** for **ACTH** at time = 0. The ACTH must be collected on ice and arrive to laboratory within 2 hours of collection.

3. Give Synacthen :

   Adult dose: 250 µg i.m /i.v.
   Child dose: 145 µg/m^2 (max 250 µg)

4. *For paediatric patients only: Take a serum sample at **30 mins for cortisol** (yellow top). Clearly label the sample with patient details, the actual time of collection and "time=30 min".*

5. For all patients: Take further serum sample at **60 mins for cortisol** (yellow top). Clearly label the sample with patient details and the time of collection and also "time = 60 min".

6. Send all serum samples for cortisol to laboratory together. EDTA sample for ACTH must arrive within 2 hours of collection.

Interpretation:

Post synacthen cortisol >450 nmol/L excludes adrenal insufficiency.

Cortisol <450nmol/L 30 mins post Synacthen and >450nmol/L 60 mins post Synacthen indicates a slow/delayed adrenal response.

Patients on opioid therapy and citalopram may demonstrate an inadequate response to synacthen.

If the patient is on oestrogen containing therapies interpret with caution as baseline levels will be higher. Consider stopping oestrogen for six weeks prior to test. Oestrogen induces cortisol binding globulin (CBG) and leads to elevated serum cortisol. In pregnancy, or those taking the oral contraceptive pill, a higher threshold of >600 nmol/L applies. Other factors that can alter CBG include: increased in pregnancy, OCP, HRT and may be decreased in liver and renal disease.

The baseline ACTH sample will only be referred for analysis if there is evidence of adrenal insufficiency (cortisol <450nmol/L post-Synacthen) to distinguish between primary and secondary adrenal failure. In the presence of adrenal insufficiency: ACTH < 10ng/L indicates secondary adrenal failure; ACTH >200ng/L indicates primary adrenal failure.

References

1. www.bnfc.nice.org.uk/drugs/tetracosactide/#indications-and-dose
2. CBG increase with OCP: El-Farahan Clin Endo (2013) 78 673-80.

Amendment History

Issue	Status	Date	Reason for Change	Authorised
1	Outdated	2020	New guideline	Moya O'Doherty
2	Published	21/01/2025	Due for annual review	Moya O'Doherty