Determining the Utility of the 60 Minute Cortisol Measurement in the Short Synacthen Test

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**Background:** The short synacthen test (SST) was introduced over 45 years ago as a faster and safer alternative to the gold standard insulin tolerance test (ITT) for the assessment of primary adrenal insufficiency¹. The test has grown in popularity among UK endocrinologists²,³. Given its widespread use, it is surprising that there remains no consensus on sampling times for serum cortisol⁴. Samples for cortisol have historically been taken at 0 and 30 minutes, with some units also taking samples at 40, 45 or 60 minutes post-synacthen administration⁴. Two UK surveys conducted 15 years apart show an increasing trend in clinicians discarding the 60 minute sampling time from the test and relying more heavily on the 30 minute sampling time⁴,⁵. This is understandable because it is the only time point that has been validated against the ITT⁶,⁷.

Given this uncertainty, we set out to determine how often a patient would be misdiagnosed as having adrenal insufficiency if the 60 minute sample was not taken.

**Aim:** To establish whether there is any value in measuring serum cortisol at 60 minutes following administration of synacthen

**Method:** A retrospective study conducted at King’s College Hospital NHS Foundation Trust (KCH), London, and the Norfolk and Norwich University Hospitals NHS Foundation Trust (NNUH) in Norwich. 250 consecutive SSTs between March 2009 and October 2010. Both centres use 550nmol/L as their cut-off value at 30 minutes⁵. There were four possible outcomes, depending on the cortisol response.

- ≥ 550nmol/L at 30 and 60 minutes = pass
- < 550nmol/L at 30 and 60 minutes = fail
- ≥ 550nmol/L at 30 minutes but < 550nmol/L at 60 minutes = pass at 30 minutes only
- < 550nmol/L at 30 minutes but ≥ 550nmol/L at 60 minutes = pass at 60 minutes only

**Discussion:** Our study shows that up to 11% of patients having an SST would be inappropriately diagnosed with adrenal insufficiency if the 60 minute sample was not used with these subjects passing the SST only at 60 minutes. Thus suggesting that they have a ‘delayed response’ to exogenous ACTH but in essence have normally functioning adrenal glands.

**Summary:** We suggest that the 60 minute cortisol measurement be retained.


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