London North West Healthcare NHS Trust

Shortcomings of the short Synacthen test; a near miss case of Addison's disease

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INTRODUCTION

- The 'short Synacthen test' first described in 1965, is widely used to confirm a clinical diagnosis of Addison's disease.
- Whilst it is mostly accepted that a normal response excludes the diagnosis of Addison's disease , we present a case of a middle-aged lady with suspicious clinical features and an initial false negative short synacthen test (SST), which resulted in a delayed diagnosis of Addison's disease.

CASE HISTORY

- A 62-year Indian lady presented to A&E with a 4 to 6 month history of generalised malaise, weakness, dizziness, vomiting and weight loss.
- Past medical history included type2 diabetes, previous left parathyroidectomy for primary hyperparathyroidism and B-thalassaemia trait.
- On examination, there was evidence of a pleural effusion with raised inflammatory markers. Buccal pigmentation was noted.
- Concerns were raised regarding adrenal insufficiency due to her clinical history and presentation.
- She received 200 mg intravenous hydrocortisone in A&E followed by broad spectrum antibiotics.
- Initial short synacthen test performed showed good response, it was only later due to high clinical suspicion when the test was repeated that a flat response was observed.

INVESTIGATIONS

- Admission bloods: Hb 106g/L, Na 129 mmol/l; K 5.6 mmol/l; Hb 106g/L, eGFR 76mL/min/1.73m^2 , TSH 4.79mIU/L
- Inflammatory markers: raised
- Chest X-Ray: small left pleural effusion, not amenable to pleural tap or drainage.
- Initial SST approximately 15hours post hydrocortisone dose: good response (Table 1).
- A few days later, SST was repeated showing flat response (Table 1).
- CT chest showed a loculated left-sided pleural effusion, as well as bulky adrenal glands suggestive of adrenal hyperplasia.
- Adrenal antibodies, remaining pituitary screen, autoimmune and viral screens: negative.
- TB excluded.

OUTCOMES

Image 1: Left: Chest XR on admission showing small left pleural effusion. **Right:** CT abdomen showing normal adrenals.

Table 1

Cortisol (nmol/l)	Initial SST	2nd SST
Basal	887	229
30 min	805	231
60 min	740	224
ACTH	10.2	**5320**
Renin (nmol/l per hour)	9	
Aldosterone (pmol/l)	<50	

Table 1: Initial SST approximately 15hours post hydrocortisone dose: good response (Table 1). A few days later, SST was repeated showing flat response

- Following her diagnosis of Addison's, she was initiated on hydrocortisone and her clinical symptoms improved significantly.
- She is now followed up routinely in our endocrinology clinic and is clinically well on prednisolone 4mg/day.

DISCUSSION

- Whilst the SST remains the standard screening test for hypoadrenalism, this case demonstrates the importance of ensuring results are interpreted in context of the clinical suspicion.
- The initial false negative SST in our patient may be due to the initial hydrocortisone dose received, although this was 15 hours prior.
- The biological half-life of hydrocortisone is approximately 100 mins, however this may be increased in context of stress, acute illness, certain diseases, and concomitant drugs (e.g. hepatic microsomal inhibitors of cytochrome P-450).
- Where clinical suspicion remains high, the test should be repeated, ideally in a non-acute setting to prevent delay of diagnosis.

References:
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Adrenal and steroids

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