Background

- Worldwide, the Short Synacthen Test (SST) is the most frequently performed diagnostic test for adrenal insufficiency.1
- There is evidence that an early morning plasma cortisol (EMC) below ~160 nmol/L is predictive of failing the SST and the corollary with an EMC above ~>340 nmol/L.2-7
- We analysed our institutions SST data, following the introduction of a new cortisol assay, to derive screening thresholds for SST and examine the relationship between basal, incremental and peak plasma cortisol.

Aim

- To determine positive predictive value (PPV) and negative predictive value (NPV) of EMC in the SST, using different EMC cut offs.

Methods

- Dataset: 393 SSTs from 2014-2017
- Data extracted:
  - Baseline cortisol (used as a surrogate for EMC)
  - Peak cortisol
  - Cortisol assay: Abbott Architect chemiluminescent immunoassay (CVs <5%)
  - Cortisol threshold to “pass” SST >430nmol/L
- Statistical analysis:
  - Correlation coefficients with increment and peak
  - Subgroup analysis: gender & pubertal status surrogates (pre-pubertal: 0-9 years old & post-pubertal: 10-16 years old)
  - PPV & NPV of “passing” or “failing” SST calculated using different thresholds for EMC

Results

- 393 SSTs: 209M, 184F, 175 pre-pubertal, 218 post-pubertal
- Baseline cortisol & peak cortisol correlation coefficient = 0.63 (fig 1)

Discussion

- A relatively strong relationship was found between baseline and peak cortisol on the SST.
- Subgroup analysis (sex and pubertal status) did not significantly strengthen correlation.
- No relationship was found between baseline and incremental cortisol.
- No patient with a baseline cortisol of >339nmol/L “failed” the SST.
- A baseline cortisol of <160nmol/L has a high PPV (0.58) for failing the SST.

References

4. Haider NF et al. The role of 0900 h Cortisol level to predict response to Short Synacthen Test in hypoadrenalism. Endocrine Abstracts 2016; 44: 36
7. Cheung K et al. Spot and Morning Cortisol in Comparison to Low Dose Short Synacthen Test. Journal of the ASEAN Federation of Endocrine Societies 2015; 9(2)

Table 1: Percentage of patients failing or passing SST if the baseline cortisol (surrogate for EMC) used as a screening test. Serum cortisol >430 nmol/L requires to “pass” SST.

<table>
<thead>
<tr>
<th>Baseline cortisol (nmol/L)</th>
<th>Number</th>
<th>Passed SST (%)</th>
<th>Failed SST (%)</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;160 nmol/L</td>
<td>123</td>
<td>52 (42%)</td>
<td>71 (58%)</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>≥340 nmol/L</td>
<td>53</td>
<td>53 (100%)</td>
<td>0 (0%)</td>
<td>/</td>
<td>1</td>
</tr>
<tr>
<td>≥320 nmol/L</td>
<td>71</td>
<td>68 (96%)</td>
<td>3 (4%)</td>
<td>/</td>
<td>0.96</td>
</tr>
<tr>
<td>≥300 nmol/L</td>
<td>83</td>
<td>80 (96%)</td>
<td>3 (4%)</td>
<td>/</td>
<td>0.96</td>
</tr>
<tr>
<td>≥275 nmol/L</td>
<td>106</td>
<td>99 (93%)</td>
<td>7 (7%)</td>
<td>/</td>
<td>0.93</td>
</tr>
<tr>
<td>≥250 nmol/L</td>
<td>140</td>
<td>130 (93%)</td>
<td>10 (7%)</td>
<td>/</td>
<td>0.93</td>
</tr>
</tbody>
</table>

There are no conflicts of interest and the authors have nothing to declare.