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Background

Diagnosing adrenal insufficiency in neonates is challenging. A multitude of clinical factors can affect cortisol measurements, including: gestational age, birth weight, time of day, day of life, antenatal steroids, mode of delivery, how unwell the baby is and other environmental factors such as pain and handling. We review clinical practice for neonatal cortisol screening and trends in results over 7 years in Oxford (2012-2018 inclusive).

Aim

To review cortisol testing in neonates at Oxford University Hospitals NHS Foundation Trust (OUH).

Objectives

To review:
• Trends in cortisol assessments.
• Indications for ‘random’ or ‘serial’ cortisol tests.
• Indications and outcomes of Synacthen tests.
• Relationships between gestational age (GA), birth weight (BW) and cortisol assessment.

Method

All cortisol tests performed on a neonate (<30 days age) between 2012 and 2018 were identified via electronic records. Paper and electronic records were reviewed retrospectively.

Results (1)

Exponential increase in cortisol tests in neonates at OUH

<table>
<thead>
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<th>2014</th>
<th>2015</th>
<th>2016</th>
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<td>67</td>
<td>67</td>
<td>51</td>
<td>29</td>
<td>29</td>
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</table>

Number of cortisol tests: 2012-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
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<td>1</td>
<td>1</td>
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Number of Synacthen tests: 2012-2018

Results (2)

Indications and outcomes of Synacthen tests (n=29)

- Low dose synacthen test (LDST) (n=8) indication for all = hypoglycaemia
  - Normal result (n=3)
  - Suboptimal result (n=5) therefore started on treatment
  - Suboptimal result (n=6)

- Short synacthen test (SST) n=21 commonest indications = hyponatraemia
  - Normal result (n=15)
  - Normal result (n=16)
  - Normal result, treatment stopped (n=3)

Repeat synacthen test (between age 3-13 months)

Clinical diagnosis: 2x Hypopituitarism: ACTH +TSHD +/- Diabetes insipidus.

Relationships between gestational age (GA), birth weight (BW) and cortisol assessment:

- GA ranged from 27 to 41 weeks. Out of the 11 abnormal synacthen tests, 7 of these were in pre-term babies (63%). However, there was no statistically significant relationship between prematurity and abnormal Synacthen tests (p=0.32).
- BW ranged from 720 to 4510 grams. Of the 11 abnormal synacthen tests, 7 of these were in SGA babies (63%). There was no statistically significant relationship between BW and abnormal Synacthen tests (p=0.52).

Summary

- There has been an exponential increase in cortisol and Synacthen tests in neonates at OUH between 2015/16 and 2017/18.
- Only 17% of patients screened warranted Synacthen tests (n=29/172).
- 6% (11/172) of those who underwent a Synacthen test had abnormal results.
- 73% (8/11) of babies were successfully weaned off treatment by age 21 months.
- That means less than 2% of neonates screened in the 7 years had ongoing adrenal insufficiency beyond 24 months of age (n=3/172).
- There is no statistically significant relationship between GA and BW and abnormal Synacthen test results.

Concluding comments

* Cortisol screening and testing indications were appropriate.
  * Specificity increased if there was another pituitary deficit.
  * On further discussion we established that the neonatal team are using a new national guideline on hypoglycaemia screening in 2017 where cortisol is tested as a first line investigation. This accounts for the increase in testing.

References

6. Taffy Makaya, Paediatric endocrinology, Oxford University Hospitals, UK.