Review of neonatal cortisol evaluation between 2012-2018 in a single centre: trends, outcomes and associations.

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Background

Diagnosing adrenal insufficiency in neonates is challenging. A multitude of clinical factors can affect cortisol measurements, including: gestational age[1,2,3], birth weight[4], time of day[5,6], day of life[1.7] antenatal steroids [1,8], mode of delivery[5], how unwell the baby is [3,5,9] and other environmental factors such as pain and handling[10,11]. 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:

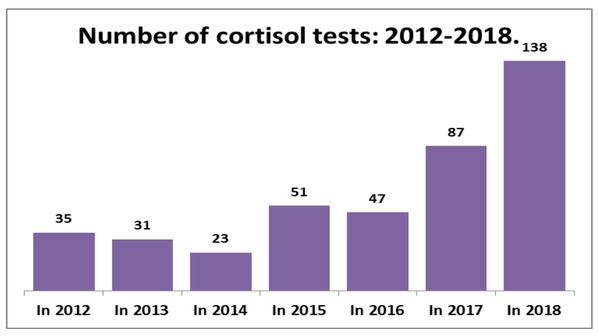
- Trends in cortisol assessments.
- Indications for 'random' or 'serial' cortisol tests.
- Indications and outcomes of Synacthen tests.
- Relationships between gestational age (GA), birth weight (BW) and cortisol assessment.

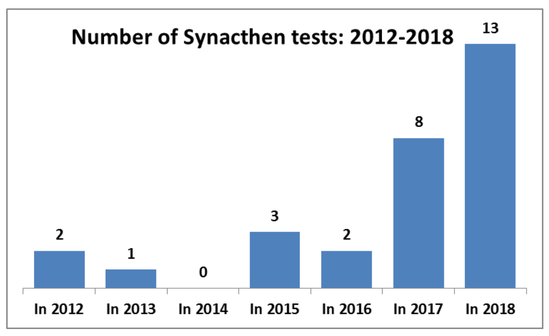
Method

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





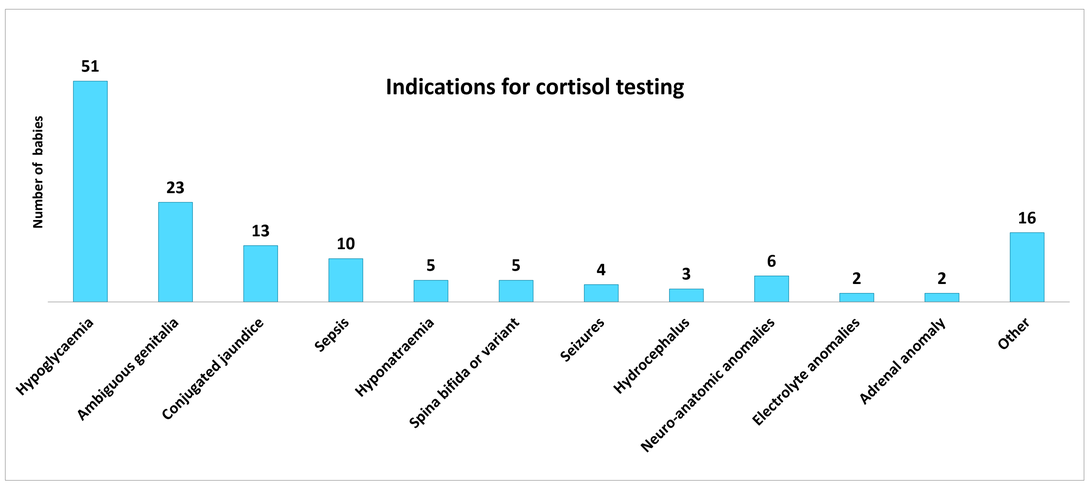
230% ↑ cortisol tests between 2015/16 and 2017/18.

430% ↑ in Synacthen tests between 2015/16 and 2017/18

*These increases are despite stable neonatal admission numbers : 1997 in 2015/2016 and 1916 in 2017/2018.

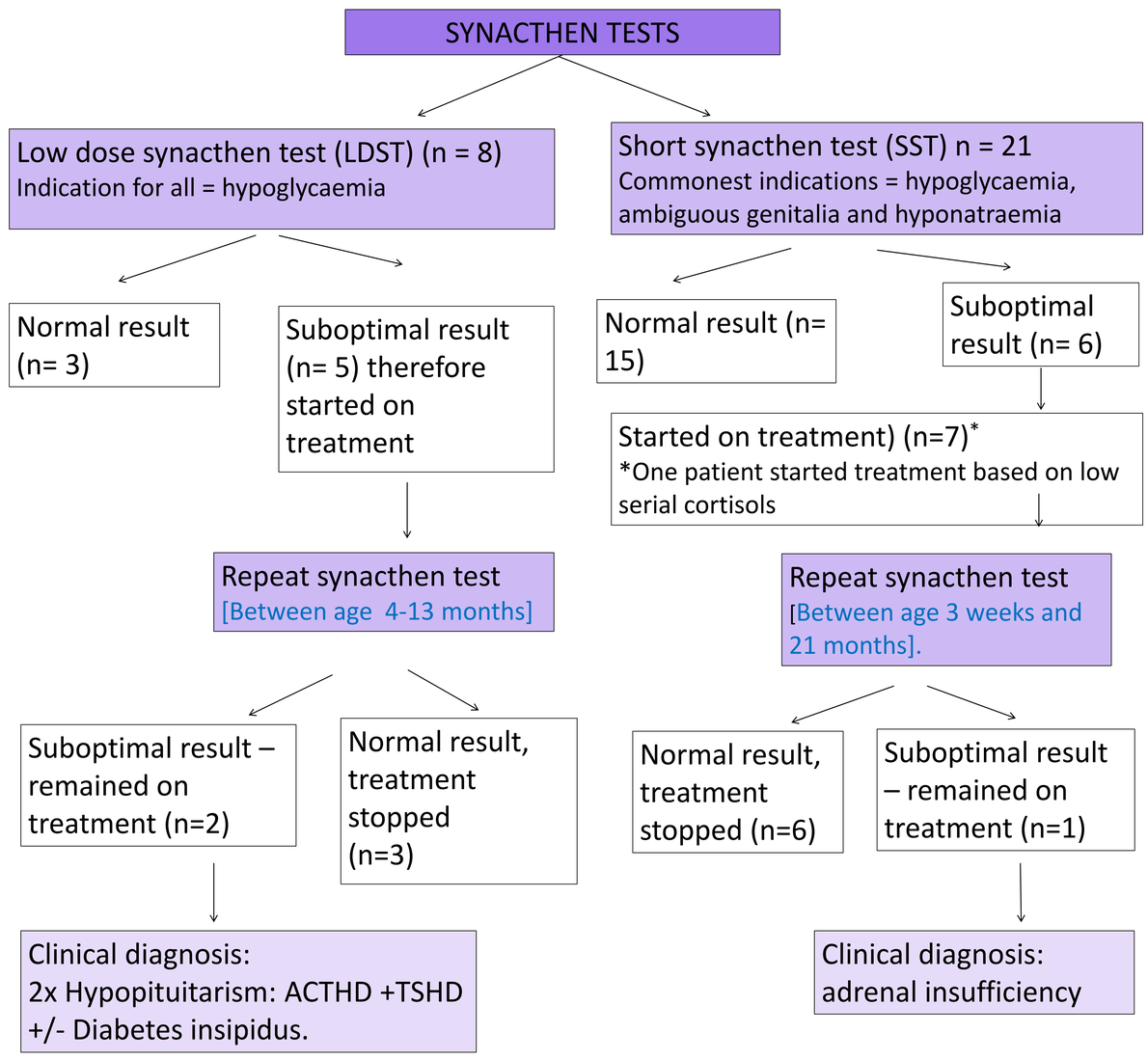
*Of the 172 babies who had had cortisols measured.,143 (83%) only had screening cortisols. 29 (17%) went on to also have a Synacthen test.

Indications for random or serial cortisol tests



Results (2)

Indications and outcomes of Synacthen tests (n=29)



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

*GA ranged from 27+1 to 41+5. Out of the 11 abnormal synacthen tests, 7 of these were in pre-term babies (63.6%). However, there was no statistically significant relationship between prematurity and abnormal Synacthen tests (p=0.32) .

*BW ranged from 720 to 4510 grams. Out of the 11 abnormal synacthen tests, 7 of these were in SGA babies (63.6%).There was no statistically significant relationship between BW and abnormal Synacthen tests: p=0.32).

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 on-going adrenal sufficiency 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 deficiency.

*On further discussion we established that the neonatal team adopted new national guidance on hypoglycemia screening in 2017 where cortisol is tested as a first line investigation. This accounts for the increase in testing.

References

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Fetal, neonatal endocrinology and metabolism (to include hypoglycaemia)

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Poster presented at: ESPE 2018 VIENNA

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