

Do neonates need a short synacthen test to investigate the adrenal axis?

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Introduction

There is limited evidence regarding the most appropriate method to investigate adrenal dysfunction in neonates.

Our Tertiary Neonatal Unit in Sheffield, UK, measures serum cortisol levels 8 hrs apart to determine the need for a low dose synacthen test (LDST). Two cortisol levels of >100nmol/L or one level of >200nmol/L would indicate normal adrenal function.

Our survey of 18/23 UK centres revealed that only one other unit has a protocol and uses the LDST as the first-line investigation in suspected adrenal insufficiency in neonates; however LDST is more invasive with anaphylactic risk.

Objectives

To determine the proportion of neonates who require LDST (1mcg synacthen) according to our screening criteria and ascertain the sensitivity and specificity of our screening test.

Methods

Retrospective analysis of a cohort of 177 neonates who underwent cortisol testing from Jan 2008 to Feb 2013.

Results

The indications to assess the adrenal axis in neonates are shown in figure 1. Of note all babies requiring screening for hypotension required only one cortisol measurement to confirm normal adrenal function.

Fig 1: The various reasons to test the adrenal axis in our neonatal unit

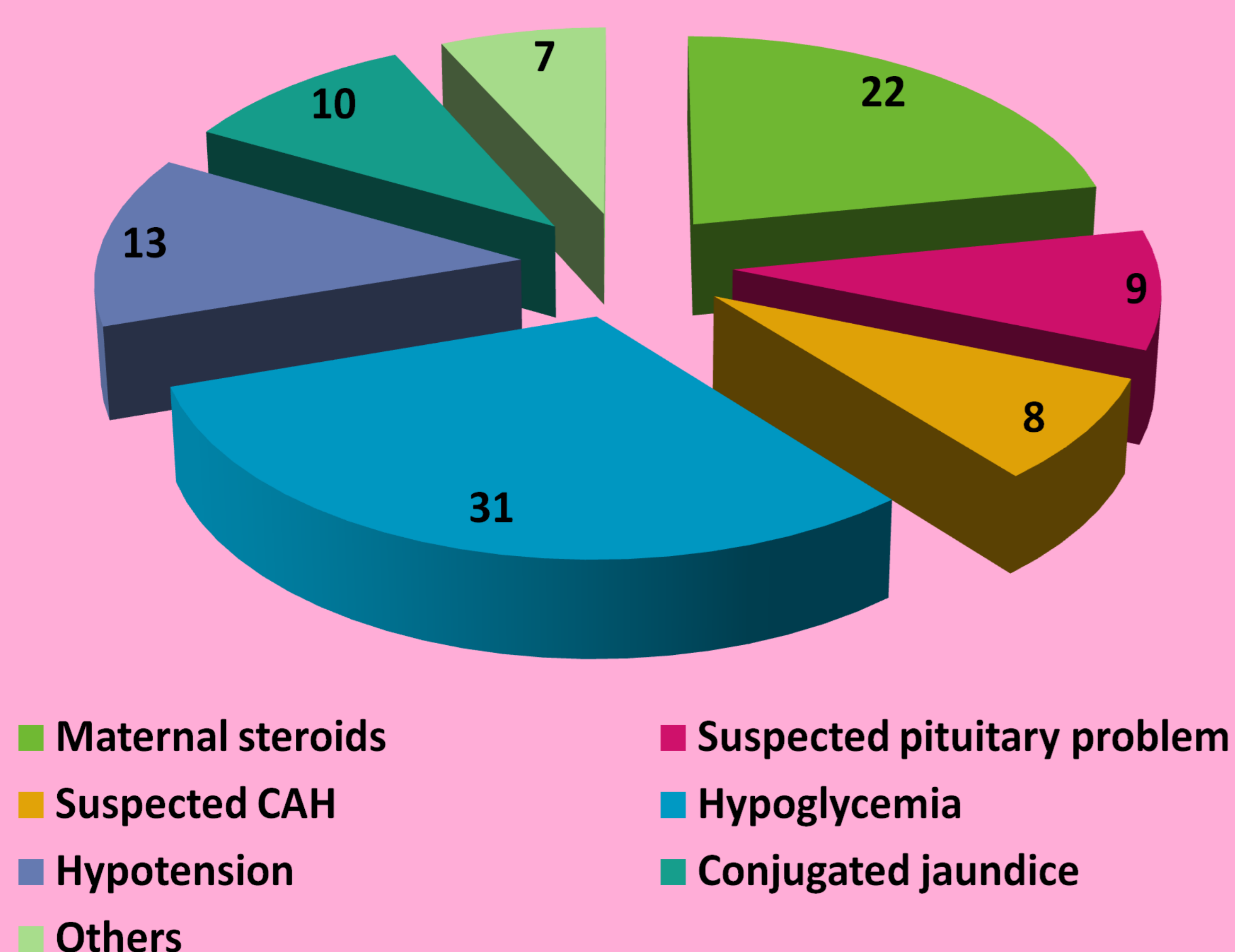


Fig 2: The outcome of the random cortisol tests (n=177)

Reason for cortisol testing	Adequate adrenal response on random cortisol testing (Two >100nmol/L or one level >200nmol/L)	The number who required LDST and had adequate adrenal response on LDST	The number who demonstrated adrenal suppression before LDST	The number who were started on hydrocortisone before LDST but had normal response on repeat testing at 3months	Total n =177
Maternal steroid intake	31	6	0	2	39
Suspected Pituitary dysplasia	12	1	3	0	16
Suspected CAH	13	0	2	0	15
Conjugated jaundice	17	0	0	0	17
Hypoglycemia	54	1	0	0	55
Hypotension	23	0	0	0	23
Other causes	12	0	0	0	12

5% (9/177) had the LDST all of which except one were normal with a peak cortisol >550nmol/L or rise of >200nmol/L from baseline.

3% (5/177) of neonates demonstrated adrenal insufficiency and they all belonged to the group of suspected pituitary dysfunction or CAH who had corresponding clinical features.

Mean random cortisol in neonates with various adrenal response (mean ± SE)



Conclusion

In our cohort 5% required LDST following screening by random cortisol testing. The most common reason was for maternal steroid intake.

All neonates who had adrenal insufficiency secondary to pituitary dysfunction or CAH were identified by our screening test.

Our screening criteria of two random serum cortisol levels >100nmol/L or one level >200nmol/L has high specificity and sensitivity and appears to be a good screening method to assess the need for a LDST to confirm adrenal insufficiency in neonates.

References

- 1) Agwu, J. C., & Bissenden, J. (2004). The low dose synacthen test: experience in well preterm infants. *Journal of Pediatric Endocrinology & Metabolism: JPEM*, 17, 1607-1612.
- 2) Korte, C., et al (1996). Adrenocortical function in the very low birth weight infant: improved testing sensitivity and association with neonatal outcome. *The Journal of Pediatrics*, 128(2), 257-63.