



Deposited via The University of Sheffield.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/237216/>

Version: Accepted Version

Proceedings Paper:

Ahmed, A., Hattangadi, I., Gopalakrishna, N. et al. (2024) P1-213: Prematurity and low birth weight may be key indicators for a low peak cortisol on neonatal Short Synacthen Tests. In: Hormone Research in Paediatrics. 62nd Annual Meeting of the European Society for Paediatric Endocrinology (ESPE), 16-18 Nov 2024, Liverpool, United Kingdom. , pp. 265-266. ISSN: 1663-2818. EISSN: 1663-2826.

This is the un-reviewed and unedited manuscript version of the following article: Hormone Research in Paediatrics 2024; 97: Suppl 3 265–266 (DOI: 10.1159/000541189). The final, published version is available at <http://www.karger.com/?doi=10.1159/000541189>.

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

Prematurity and low birth weight may be key indicators for a low peak cortisol on neonatal Short Synacthen Tests

Aneeq Ahmed¹, Ibani Hattangadi¹, Nagapratheek Gopalakrishna², Shamani De Silva², Charlotte Elder^{2,3}, Elspeth Ferguson²

¹The University of Sheffield Medical School, Sheffield, United Kingdom. ²Department of Endocrinology, Sheffield Children's NHS Foundation Trust, Sheffield, United Kingdom.

³Department of Oncology and Metabolism, University of Sheffield, Sheffield, United Kingdom

Abstract

Background: There are multiple indications where evaluation of the Hypothalamic-pituitary-adrenal (HPA) axis in neonates may be considered e.g. hypoglycaemia, hypotension, conjugated hyperbilirubinemia; however permanent neonatal adrenal insufficiency (AI) is rare. Interpretation of results can be challenging due to a paucity of normative reference data in this population. This risks overdiagnosis and unnecessary treatment with corticosteroids leading to the associated iatrogenic harm, including steroid induced AI.

Methods: We undertook a retrospective case note review of all neonates who underwent random and/or stimulated cortisol measurements at a tertiary neonatal department in the UK over a seven-year period (June 2014 to July 2021). Demographic, clinical and outcome data were collected. Serum cortisol samples were analysed using the Roche Elecsys Cortisol-2 assay. A pass was defined as a peak cortisol >430nmol/L. Prior to 2016, the first-generation Roche Cobas cortisol assay was used in which a pass was defined as a peak cortisol >500nmol/L.

Results: In total, 443 neonates had serum cortisol concentrations measured during the study period. Of these, 119 (72M, 47F; 40% preterm, 60% term; gestational age (GA) range 22+5 to 41+3 weeks; 21% ELBW, 10% VLBW, 19% LBW) underwent stimulation testing with a Short Synacthen Test (SST); 92 (77%) following one or more unstimulated cortisol measurements and 27 (23%) had only an SST. The most common indications for SST were maternal antenatal steroid use (29%) and conjugated hyperbilirubinemia (24%). Overall, 89 (75%) demonstrated a normal SST response, 30 (25%) had a suboptimal response of whom two received a diagnosis of permanent AI, one died before repeat SST and four were lost to follow-up after being transferred back to their local unit. The remaining 23 (14M; 20 preterm; mean GA 29+4; 61% ELBW, 13% VLBW, 17% LBW) subsequently passed on repeat SST. There was a positive correlation between GA and peak cortisol on SST ($r=0.490$, $p<0.001$) and peak cortisol on SST and birth weight z-score ($r=0.216$, $p=0.020$).

Discussion: In our experience, very few neonates who undergo HPA-axis testing are diagnosed with permanent AI (2/443, 0.45%) and the majority who have a suboptimal response subsequently pass their SST. The clinical relevance of this "transient AI" is unknown and may be due to the lack of neonatal specific reference data leading to false positive results. Our data indicate that prematurity and low birth weight are associated with lower peak cortisol on SST response supporting the need to establish normative neonatal adrenal function data.