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# Effect of maternal steroid medication prescribed during pregnancy on neonatal adrenal function

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**Background**: There is limited data supporting concerns that systemic corticosteroids, prescribed in pregnancy for maternal health reasons, can suppress the neonatal Hypothalamic-Pituitary-Adrenal (HPA) axis. Our study aimed to determine if neonates born to mothers on long-term or high dose steroids are at risk of adrenal suppression.

**Methodology**: Neonates who underwent assessment of adrenal function over a seven-year period (July 2014-June 2021) at our tertiary neonatal unit in Sheffield, UK, were identified from laboratory records. Current guidance recommends a standard-dose short synacthen test (SST) after 24 hours of age for neonates born to mothers receiving ≥7.5mg/day prednisolone for 28 consecutive days in the 3rd trimester (cohort 1). This replaced previous guidance in 2019, which advised taking three random cortisol levels 8 hours apart on day three of life (cohort 2). A normal SST was defined as a peak cortisol >430nmol/l. Data regarding maternal steroid formulation, dose and duration, along with neonatal demographic data and outcomes were obtained through retrospective case note review.

**Results**: Over the study period 56 babies underwent assessment of adrenal function due to maternal steroid use during pregnancy. Gestational age ranged from 28-41 weeks. Steroid data were obtained from 38 mothers. The equivalent dose of prednisolone ranged from 5mg to 40mg taken for between one month to the entire pregnancy.

Of the 18 neonates in cohort-1, three had a suboptimal response to Synacthen stimulation, with a peak cortisol between 318-348 nmol/L. All were managed with 'sick day rule' hydrocortisone rather than starting on steroid replacement. Mother-1 received 60-80mg/day IV hydrocortisone for 3 weeks, followed by 4 weeks of 15-20mg/day prednisolone, with delivery at 36+5 weeks. Mother-2 received 20mg/day prednisolone from 24 weeks gestation and delivered at 32+4 weeks. Dose and duration of steroids was unavailable for mother-3, who delivered at 35+3 weeks. Baby-1 & -3 had a normal repeat SST after 6 weeks, baby-2 was lost to follow-up following transfer to another unit. Of the 38 neonates in cohort-2, 16 underwent a subsequent SST all of whom demonstrated a normal response.

**Conclusion:** Whilst the majority of babies born to mothers using corticosteroids in pregnancy have normal adrenal function, some may be at risk of transient adrenal suppression. Dose and duration may play a role. Further studies detailing normal adrenal function in neonates and the effect of maternal steroids use in pregnancy are required to inform in whom HPA-axis assessment maybe necessary, the best method of assessment and interpretation.