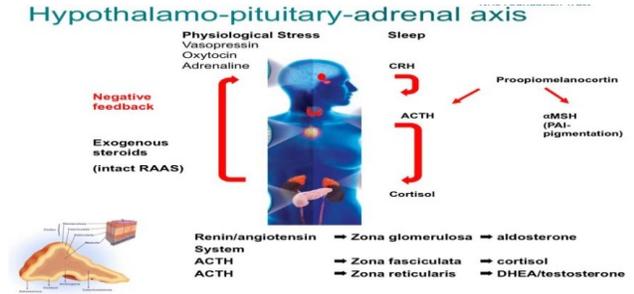


Cortisol measurement post steroids (Dexamethasone) treatment for COVID-19

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Introduction

- We are currently mid Covid-19 pandemic. In the last year there have been 230,418,451 confirmed Covid-19 cases worldwide, with an estimated 4,724,876 deaths, estimated 5,874,934,542 vaccine doses administered by September 2021. (1)
- The RECOVERY trial reported for patients hospitalized with Covid-19, the use of dexamethasone (6mg for 10 days) resulted in lower 28-day mortality among those who were receiving either invasive mechanical ventilation or oxygen alone at randomisation. (2)
- Exogenous glucocorticoids cause suppression of the hypothalamic-pituitary-adrenal (HPA) axis.
- Adrenal insufficiency (AI) is a serious, potentially life-threatening especially in a ITU cohort undergoing invasive procedures. (3)
- Objective**
- We aimed to investigate the effects of Covid Dexamethasone protocols on adrenal function.

Methodology

- We collected data from patients admitted with a diagnosis of Covid-19 by searching electronic patient records from November 2020 to March 2021 at our institution.
- We included patients with a diagnosis of COVID-19 treated with Dexamethasone, Hydrocortisone, or prednisolone. There were 2 protocols used.
 - 7-10 days of 6mg/day
 - Total 22 days- 7-10- day 6mg dexamethasone followed by ARDS type protocol for those patients with evidence of organising interstitial process.
- We also recorded factors that may also affect adrenal function including:
 - Patients on long term corticosteroids (i.e. inhaled, topical, injectable, and oral)
 - Patients on CYP3A4 enzyme inhibitors
 - Patients on opioids
 - Adrenal function was screened by 0600-0800 cortisol, at least 48 hours off of steroids. Cortisol levels >300 nmol/l excluded adrenal insufficiency.
 - Cortisol concentration between 100-300 nmol/l underwent Short Synacthen Test. (250mcg Tetracosactin)

Results:

- 79 patients were alive at the time of initial data collection. 51/79 patients had 7-10 days 6mg dexamethasone whilst 28/79 had additional ARDS regimen of dexamethasone. 8 of this group died, and data available for 60 patients.
- 18/60 had suboptimal cortisol level (<300nmol/L)
- 5/60 had cortisol <100 nmol 48 hours after stopping dexamethasone, 4 of these having had ARDS regimen of prolonged dexamethasone. 10 patients recovered their axis prior to confirmatory testing within 1-4 weeks.
- Confirmatory testing undertaken SST (Short Synacthen test) on 6/18 patients. 4 had satisfactory results, 2 of them unable to attend yet.

Total numbers of patients	79
Number of data available	60
Duration of steroid use:	
Short term steroids use 7-10 days, Dexamethasone 6mg	51
ARDS steroid use (>10 days) median use 32 days, Dexamethasone 33 mg	28
Number of patients died	8
Cortisol level	
>300 nmol/L	42
300-100 nmol/L	13
<100 nmol/L * Started on hydrocortisone	5
Cortisol 300-100nmol/L	
Cortisol level recovered prior to SST in 1-4 weeks after holding hydrocortisone dose evening before and day of the test	10
SST performed with normal results	5
Reducing dose of dexamethasone for ARDS	2
On hydrocortisone awaiting SST	1

Summary:

- Dexamethasone is known to cause HPA axis suppression
- No patient on 7-10 days 6mg dexamethasone had adrenal insufficiency after stopping the dexamethasone.
- 18 patients had evidence of AI early after stopping dexamethasone, but this recovered within 1-4 weeks in at least 10 patients suggesting the HA axis suppression to be temporary.
- Almost 50% of patients on ARDS regimen on ICU had early evidence adrenal insufficiency- rate of recovery unclear because of deaths in this cohort.
- It is important to be aware and screen for AI as these patients will be at risk of adrenal crisis if left undiagnosed.
- This acutely unwell cohort may need steroid cover for invasive procedures such as tracheostomy during this period of AI
- These data also suggest that Covid-19 itself does not cause adrenal insufficiency.
- These data were collected during the second covid wave by a clinical team on the intensive care unit.
- More precise studies are needed to confirm these data.

References:

- [WHO Health Emergency Dashboard WHO \(COVID-19\) Homepage](#)
- RECOVERY Collaborative Group. Dexamethasone in Hospitalized Patients with Covid-19. N Engl J Med. 2021 Feb 25;384(8):693-704.
- Husebye ES, Pearce SH, Krone NP et al Adrenal insufficiency. Lancet. 2021 Feb 13;397(10274):613-629