

Transient Hypocortisolaemia in a patient with HIV

Nikhil Jain¹, Aditi Sharma¹, Vassiliki Bravis^{1,2}

¹ Department Of Endocrinology and Diabetes, St Mary's Hospital, Imperial College Healthcare NHS trust, London.

² Department of Endocrinology, Diabetes and Metabolism, Imperial College, London.

Introduction

- HIV infection can cause innumerate abnormalities both physically and biochemically due to the plethora of infections it can leave a patient susceptible to.
- In addition to pathology driven by infections the presence of the HIV virus itself can drive various other pathologies - of these one such documented phenomenon is HIV associated hypocortisolaemia.

Initial Presentation

A 53 year old lady with a long history of HIV, attended endocrinology clinic with a random cortisol of < 20nmol/L. She reported symptoms of fatigue, loss of appetite and 13 kg weight loss.

A short synacthen test done at the time of first presentation showed an inadequate cortisol response:

- 0 min-378 nmol/L
- 30 min-418 nmol/L (should increase by > 200)
- 60 min-488 nmol/L (should increase by >600 from 0 min)

All other endocrine axes remained intact.
Adrenal Antibodies were intact.
CD4 count was 222 cells/microlitre
CT CAP, adrenal and brain MRI showed no pathology.

Patient Progress

- Patient had been on Ritonavir but this was switched to Raltegravir.
- She was started on steroid replacement with Prednisolone 2mg once daily.
- Successful response to Prednisolone was confirmed with a prednisolone curve – **peak prednisolone was 16 mcg/L**
- The patient's weight and appetite soon recovered after the commencement of therapy.
- Serial synacthen tests after first presentation continued to show inadequate response as the patient was followed up for 2 years. 1 Year post commencement of therapy:
 - 0 min- 41 nmol/L
 - 30min- 318 nmol/L
 - 60 min- 378 nmol/L
- However when the patient was recorded as having the highest **CD4 count of 667 cells/microlitre, a long synacthen test showed her initial cortisol as 232 nmol/L with a peak of 834 nmol/L-** suggesting adequate cortisol response at time of optimised immunity.(table 1).
- She is currently being tapered off the steroid therapy with the view to coming off steroids altogether.

Discussion

- Our patient at first presentation 'failed' a short synacthen test. The exact reason for this result is difficult to truly establish.
- The lack of radiological evidence for common pathologies and the preservation of all other branches of the hypothalamo-pituitary axis means that we need to consider another cause.
- The mechanism by which HIV might affect the endocrine function involves the immunomodulatory effects of cytokines¹. Impaired adrenal reserve is a reported finding in HIV-infected patients.
- Other documented effects of HIV on patients' cortisol axis include a change in the diurnal rhythm of cortisol production and changes in ACTH stimulation according to the CD4 count and viral load in the phase of their disease.
- Ideally a direct correlation between CD4 count or viral load and cortisol levels should be sought to assess for direct effect of the virus on cortisol levels.

Table 1. Long synacthen test with corresponding CD4 count of 667

Time (minutes)	Cortisol level (nmol/L)
0	232
60	532
240	688
360	766
480	834
1440	659
2880	280

Conclusion

- The causality between HIV infection and a transient hypocortisolaemia is difficult to prove.
- However other biochemical abnormalities (even in the corticotrophic axis) have been uncovered in HIV positive patients.
- Further areas of investigation could include a correlation between CD4 count or viral load and cortisol levels to assess for direct effect of the virus on cortisol levels.
- It should also however be considered that the constitutional effects of the virus itself can give non-specific symptoms such as weight loss, fatigue, nausea and vomiting, resembling those of adrenal insufficiency, making the diagnosis more challenging.

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