

Stress Steroids

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James talks to Dr Barbara Depczynski about stress steroids.

Steroids are commonly charted by junior doctors on the wards. Understanding their side effects and the requirement to consider stress doses associated with chronic steroid use is vital.

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About Dr Barbara Depczynski

Barbara Depczynski is a senior staff specialist in [Endocrinology](#) at Prince of Wales Hospital. Barbara's major interests are [type 2 diabetes](#), inpatient diabetes management, pituitary disease and PCOS. She serves on [ACI](#) In Hospital Diabetes Management Working Group. Barbara is involved with both undergraduate and post graduate teaching.

Stress steroids

With Dr Barbara Depczynski, Endocrinologist at Prince of Wales Hospital, New South Wales, Australia

Introduction

Steroids are commonly charted by junior doctors on the wards. Understanding their side effects and the requirement to consider stress doses associated with chronic steroid use is vital.

Case

A 65-year-old female arrives on the ward in the evening following presentation to the Emergency Department with urosepsis. The patient had been commenced on antibiotics. The patient has a long history of rheumatoid arthritis for which she takes 10mg of prednisone daily and has poorly controlled diabetes.

1. What are the common side effects of corticosteroid use?

- **Hyperglycaemia**
 - Most common side effect, affecting up to 70% of patients

- Monitor BSL or monitor Hba1c in already established diabetics
- Manage with insulin
- Infections
 - Difficult to detect as fever response is suppressed
- Poor wound healing
- Gastrointestinal hemorrhage
- Fluid retention
- Psychosis
- Long term - fracture and osteoporosis
- Obesity
- Iatrogenic suppression of hypothalamic-pituitary-adrenal axis if steroids are used long term - this complication applies to the patient in the case

2. Is the patient in this case at risk of iatrogenic suppression of the hypothalamic-pituitary-adrenal axis?

- Usually 15 mg a day for three weeks of steroids will result in suppressed axis. This patient is at risk of hypocortisolism because she is on long term steroids and she sounds very sick.
- She will require additional steroids to cover for any illness or surgical procedures.
- Patients, especially those with Addison's disease, are usually taught to give intramuscular steroids during periods of severe illness or vomiting to prevent an Addisonian crisis which is life threatening.
- 15 mg a day for three weeks will result in suppressed axis, but this can vary.

3. What does the adrenal gland have to do with blood pressure?

- Steroids have a permissive effect on the cardiovascular system. They are positively inotropic and they enhance the activity of the beta adrenergic receptors of arteriole smooth muscle cells.

4. What dose and route of steroid would be appropriate for this patient?

- This is an individual decision that requires consultation with senior members of the team.
- Possible dosing for this patient: hydrocortisone 50mg first dose, then 25-50mg Q6hourly depending on the patient's clinical status. This dose will need to be reviewed and adjusted.

5. In this patient, would hydrocortisone or dexamethasone be preferred?

- Hydrocortisone is readily available on the ward, and has both glucocorticoid and mineralocorticoid effect.
- This situation warrants the glucocorticoid effect, because the patient has secondary hypocortisolism and will not require any mineralocorticoid effect. Both hydrocortisone and dexamethasone would thus be satisfactory in this situation.

6. What are the signs, symptoms, and laboratory markers of an Addisonian crisis?

- Addisonian crisis may be difficult to recognise clinically as the symptoms are non-specific.
- Signs and symptoms: hypotension, nausea, vomiting, confusion, reduced level of consciousness, abdominal pain.
- Laboratory test: hyponatremia, hyperkalemia (primary hydrocortisolism), elevated urea, hyperglycemia.

7. Signs and symptoms of primary adrenal insufficiency?

- Buccal pigmentation, pigmentation of palmar creases, pigmentation of scars, and signs and symptoms of autoimmune diseases and virilisation (if the patient has congenital adrenal hyperplasia).
- Hyponatremia, evidence of volume contraction, and hyperkalemia. If the patient is well, perform morning cortisol and ACTH to assess for hypoadrenalism.

8. Despite the administration of steroids, the patient went into septic shock and went to ICU. The patient is now back on the ward and is better, but still on 50mg hydrocortisone QID. What is the approach to weaning steroids?

- The weaning regime depends on the clinical status of the patient, but the goal will be to wean the steroid to the patient's physiological replacement.



Take home messages

- Ensure that stress glucocorticoid is given when the patient is at risk of hypocortisolism.
- Wean steroids as clinically appropriate and have a long term plan for steroid dosing.
- Beware of and manage the long term consequences of steroid therapy, including osteoporosis.

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