Introduction

An adrenal crisis (AC) is a life-threatening situation resulting from insufficient levels of cortisol, a hormone produced and released by the adrenal gland. Over 8% of patients with known Addison’s disease require emergency treatment for AC each year. For undiagnosed cases the presentation can be vague and non-specific. If unrecognised, acute AC can lead to a life threatening crisis with acute cardiovascular collapse.

Situations in which acute adrenal crisis can occur

- Patients with known Addison’s disease or secondary (hypothalamic or pituitary) adrenal failure.
- Patients with congenital adrenal hyperplasia.
- Patients on pharmacological doses of prednisolone or other glucocorticoids, including dexamethasone if they have received a ‘prednisolone equivalent’ dose of greater than 5 mg daily for longer than one month.
- Patients taking long term inhaled steroids.
- Patients taking long term topical steroids.

Precipitators

Intercurrent illness is the commonest precipitant of AC. Significant infection, major surgery, vomiting with inadequate steroid absorption or major stress from trauma are common precipitants of AC in patients with adrenal failure and require increases in cortisol doses to support the physiological stress response.

Patients with known adrenal failure should be familiar with the 'sick day rules' in relation to their hydrocortisone therapy – see below for summary.

Diagnosis

AC should be suspected if a patient had two or more of the following:

- Nausea and/or Vomiting
- Severe fatigue
- Severe headache
- Mental confusion
- Hypotension (SBP<100mm Hg) causing postural dizziness
- Hyponatraemia
- Hyperkalaemia
- Hypoglycaemia

If AC is suspected DO NOT wait for the results before starting the treatment (SEE BELOW).

In ALL patients perform:

- FBC
- U&E, LFT, glucose, lipase
- Capillary glucose
- Venous blood gas

If a suspected NEW diagnosis take blood for (desirable, not essential):

- Random cortisol and ACTH
Initial Assessment

- Assess A B C
- If hypotensive/oliguric consider admission to a level 1 or 2 bed
- Obtain intravenous access and take samples (see above)

TREATMENT

- **Intravenous fluids – 0.9% saline**
  - Infusion rate 1 litre per hour until SBP > 100mg Hg, then reduced rate according to clinical state.
- **Intravenous hydrocortisone**
  - 100mg IV stat then 100mg IV qds for 24 – 48 hours
  - If unable to gain IV access give same dose as intramuscular injection
- **If hypoglycaemic (blood glucose < 4.0 mmol/L)**
  - 100ml 20% dextrose over 10-15 minutes stat
  - Intravenous infusion 10% dextrose at 100ml/hr if hypoglycaemia persists
  - Monitor blood glucose hourly
- Identify and treat potential precipitating causes such as sepsis as appropriate
- Close monitoring of observations including pulse, blood pressure, capillary glucose and Glasgow coma score
- Strict fluid input and output
- Electrolyte monitoring at 4 hours, 12 hours and 24 hours

Usually, these high doses of hydrocortisone can be weaned to oral maintenance doses of hydrocortisone after 24 - 72 hours, provided the patient's condition is improving.

*For patients who are taking the mineralocorticoid fludrocortisone there is no need to adjust the dose in the event of an AC.*

Contact the endocrine team (endocrine registrar via switchboard) in ALL cases of suspected or known adrenal insufficiency for advice on ongoing management
After recovery

Liaise with endocrine team for a full patient review of their endocrine management.

Provide patient with sick day rule information – see below.

Ensure the patient is supplied with TWO 100mg vials of hydrocortisone sodium on discharge using one of the following formulations:

- Solu-cortef (hydrocortisone sodium succinate) – also requires 2 vials of water (2ml) for injection, 2ml syringes and needles for im injection.
- Efcortisol* (hydrocortisone sodium phosphate) – 100mg/ml vials plus syringe and needle for im injection.

*Sick day rules for patients with known adreno-cortical insufficiency*

- Double the normal dose of hydrocortisone for a fever of more than 37.5 C or for infection/sepsis requiring antibiotic.
- For severe nausea (often with headache), take 20mg hydrocortisone orally and sip rehydration/electrolyte fluids (e.g. Dioralyte).
- On vomiting, use the emergency injection (100mg hydrocortisone) immediately. Then call a doctor, saying Addison’s emergency.
- Take 20mg hydrocortisone orally immediately after major injury to avoid shock.
- Ensure the anaesthetist and surgical team, dentist or endoscopist are aware of the need for extra oral medication and that they have checked the ACAP surgical guidelines for the correct level of steroid cover, available at www.addisons.org.uk/publications.

*Note there are manufacturing problems with Efcortisol as of Jan 2016 – check with local pharmacist*

Further information is available at:

www.cks.nice.org.uk/addisons-disease

www.addisons.org.uk