Rapid overview: adrenal crisis from : www.uptodate.com

Signs and symptoms that may indicate adrenal crisis:

- Hypotension or shock, particularly if disproportionate to apparent underlying illness.
- Serum electrolyte abnormalities: Hyponatremia, Hyperkalemia, Hypoglycemia
- Vomiting and diarrhea, sometimes with severe abdominal pain or unexplained fever, weight loss and anorexia.

Consider the diagnosis in:

- *Any patient with known disorders of adrenal insufficiency* (eg, congenital adrenal hyperplasia), especially if exposed to stress (illness).
- Other patients presenting with the above signs, especially with *hyperpigmentation or vitiligo*.
- *Critically ill patients with septic shock*, who are unresponsive to fluid resuscitation and inotropic medications (in this case, adrenal crisis is caused by bilateral adrenal hemorrhage).
- Patients on or withdrawing from *chronic treatment with steroids*, especially if exposed to stress.
- Patients with *other autoimmune endocrine deficiencies*, such as hypothyroidism or gonadal failure.
- *Neonates with the above symptoms and signs* should prompt consideration of the diagnosis of congenital adrenal hyperplasia (CAH) due to 21-hydroxylase deficiency, or (very rarely) other causes of adrenal insufficiency.

In the United States, 21-hydroxylase deficiency is part of the newborn screen in most states, so most such infants will be diagnosed prior to presentation with adrenal crisis. Adrenal crisis usually presents between the first and fourth week of life. Affected females will have ambiguous genitalia; males usually have no obvious genital abnormalities.

The presentation of adrenal crisis in an infant may mimic that of pyloric stenosis. However, infants with pyloric stenosis typically have hypokalemic alkalosis rather than the hyperkalemic acidosis that is typical of adrenal crisis.

Evaluation:

- If adrenal crisis is suspected, then patients should be treated empirically with stress doses of corticosteroids, as outlined below.
- Baseline blood samples should be drawn for subsequent testing for electrolytes, glucose, cortisol and other steroids, and ACTH, prior to the administration of corticosteroids. Treatment should not be delayed pending results.

Treatment:

- *Fluids:* give bolus of 5 percent Dextrose with 0.9 percent saline, without potassium (D5NS), 20 mg/kg over one hour
- *Stress steroids:* administer hydrocortisone succinate (SoluCortef) urgently at the following doses:

  Infants and toddlers, 0 to 3 years old: 25 mg IV

Children 3 to 12 years: 50 mg IV

Children and adolescents 12 years and older: 100 mg IV

- Continue corticosteroids at the same dose given as a constant rate over the following 24 hours.
- *Electrolytes:* if hyperkalemia is present or is suspected, perform EKG to evaluate

EKG changes consistent with hyperkalemia: initially a tall peaked T wave with shortened QT interval, followed by progressive lengthening of the PR interval and QRS duration.

If these changes are present, treat with insulin and glucose infusion, with or without other measures to treat hyperkalemia (See "Clinical manifestations and treatment of hyperkalemia").

Monitor and treat other electrolyte abnormalities and fluid balance.

- Add Fludrocortisone (Florinef) 0.1 mg tab: 1 # BID

Table 2. Typical Signs and Symptoms of Acute Adrenal Crisis

- Decreased activity/fatigue
- Altered sensorium/unresponsiveness
- Poor feeding/weak suck
- Dry mucous membranes
- Hyperpigmentation
- Abdominal pain
- Vomiting
- Hyponatremia
- Hyperkalemia
- Hypoglycemia
- Metabolic acidosis
- Hypothermia
- Hypotension
- Dehydration
- Lack of weight gain

Table 3. Initial Important Laboratory Evaluation

- Glucose/dextrose stick at bedside
- Chem-20 (including electrolytes and liver functior panel)
- Arterial blood gas/serum pH
- Cortisol
- ACTH
- 17-OHP
- Pelvic ultrasonography
- Karyotype

- Aldosterone
- 17a-OH PGTR
- Renin
- ASD(Androstenedione)
- DHEA-S
- Ms/Ms

★ Treatment for hyperkalemia

- Calcium gluconate 10% solution, 1 mL/kg IV, over 3–5 min
- Sodium bicarbonate, 1–2 mEq/kg IV, over 5–10 min
- Regular insulin, 0.1 U/kg, with glucose 50% solution, 1 mL/kg, over 1 hr
  (或可 D10W 一包加 10u RI)
- Kalimate powder enema
- Hemodialysis or peritoneal dialysis