

In patients with primary adrenal insufficiency caused by autoimmune adrenalitis or adrenomyeloneuropathy, imaging of the adrenal glands is not necessary. In all other cases, a CT scan of the adrenal glands should be performed for the differential diagnosis. Marked enlargement of the adrenal glands with or without calcifications in patients with tuberculous adrenal insufficiency is usually a sign of active infection and an indication for treatment with anti-tuberculosis drugs.^{40,41} The adrenal glands are also enlarged in patients with adrenal insufficiency caused by fungal infections, metastatic cancer, lymphoma, and AIDS.^{3,4} A CT-guided fine-needle biopsy of adrenal masses can be helpful in the differential diagnosis.

TREATMENT

Replacement Therapy

Patients with symptomatic adrenal insufficiency, but not those with minimal abnormalities on hormone tests, should be treated with hydrocortisone or cortisone in the early morning and afternoon. The usual initial dose is 25 mg of hydrocortisone (divided into doses of 15 and 10 mg) or 37.5 mg of cortisone (divided into doses of 25 and 12.5 mg), but the daily dose may be decreased to 20 or 15 mg of hydrocortisone as long as the patient's well-being and physical strength are not reduced. The goal should be to use the smallest dose that relieves the patient's symptoms, in order to prevent weight gain and osteoporosis.^{2-4,21,42} Measurements of urinary cortisol may help determine the appropriate dose of hydrocortisone.

Patients with primary adrenal insufficiency should also receive fludrocortisone, in a single daily dose of 50 to 200 μg , as a substitute for aldosterone. The dose can be guided by measurements of blood pressure, serum potassium, and plasma renin activity, which should be in the upper-normal range.^{19,26} All patients with adrenal insufficiency should carry a card containing information on current therapy and recommendations for treatment in emergency situations, and they should also wear some type of warning bracelet or necklace, such as those issued by Medic Alert.²¹ Patients must be advised to double or triple the dose of hydrocortisone temporarily whenever they have any febrile illness or injury, and should be given ampules of glucocorticoid for self-injection or glucocorticoid suppositories to be used in the case of vomiting.⁴³

Emergency Therapy

Patients with acute adrenal insufficiency need immediate treatment with a high dose of intravenous hydrocortisone (100 mg as a bolus dose followed by an infusion of 100 to 200 mg given over a period of 24 hours). Patients with hypovolemia and hyponatremia should be given isotonic saline intrave-

nously. The volume needed may be large and should be supplemented with glucose. In most patients, oral therapy can be resumed in one or two days.^{3,4,21}

CONCLUSIONS

Primary adrenal insufficiency can become a life-threatening disorder in any stressful situation, since cortisol secretion cannot be increased at all. The symptoms of secondary adrenal insufficiency as part of hypothalamic or pituitary disease can range from severe to absent. Mild secondary adrenal insufficiency can be detected with sensitive hormone tests and does not usually require regular treatment with hydrocortisone. However, patients should temporarily be treated with hydrocortisone in stressful situations, such as during major surgery. **Acute adrenal insufficiency in a patient with a previously unknown adrenal disorder is a demanding diagnostic challenge. The patient will die if the diagnosis is not made in time.** On the other hand, treatment of an adrenal crisis with full recovery of a dangerously ill patient within a few days is one of the greatest achievements of modern medicine.

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