The Endocrine System

PROTOTYPE DRUG

Hydrocortisone (Cortef, Hydrocortone, others) | Glucocorticoid

ACTIONS AND USES

Structurally identical with the natural hormone cortisol, hydrocortisone is a synthetic corticosterone that is the drug of choice for treating adrenocortical insufficiency. When used for replacement therapy, it is given at physiological doses. Once proper dosing is achieved, its therapeutic effects should mimic those of endogenous corticosteroids. Hydrocortisone is also available for the treatment of inflammation, allergic disorders, and many other conditions. Intra-articular injections may be given to decrease severe inflammation in affected joints.

Hydrocortisone is available in six different formulations. Hydrocortisone base (Aeroseb-HC, Alphaderm, Cetacort, others) and hydrocortisone acetate (Anusol HC, Cortaid, Cortef Acetate) are available as oral preparations, creams, and ointments. Hydrocortisone cypionate (Cortef Fluid) is an oral suspension. Hydrocortisone sodium phosphate (Hydrocortone Phosphate) and hydrocortisone sodium succinate (A-Hydrocort, Solu-Cortef) are for parenteral use only. Hydrocortisone valerate (Westcort) is only for topical applications.

INTERACTIONS

Drug–Drug: Barbiturates, phenytoin, and rifampin may increase hepatic metabolism, thus decreasing hydrocortisone levels. Estrogens potentiate the effects of hydrocortisone. Use with nonsteroidal anti-inflammatory drugs (NSAIDs) increases the risk of peptic ulcers. Cholestyramine and colestipol decrease hydrocortisone absorption. Diuretics and amphotericin B increase the risk of hypokalemia. Anticholinesterase agents may produce severe weakness. Hydrocortisone may cause a decrease in immune response to vaccines and toxoids.

Lab Tests: May increase serum values for glucose, cholesterol, sodium, uric acid, or calcium. May decrease serum values of potassium and T3/T4.

Herbal/Food: Use of hydrocortisone with senna, cascara, or buckthorn may cause potassium deficiency with chronic use.

Treatment of Overdose: There is no specific treatment for overdose.

ADMINISTRATION ALERTS

- Administer exactly as prescribed and at the same time every day.
- Administer oral formulations with food.
- Pregnancy category C.

PHARMACOKINETICS

Onset: 1–2 h PO; 20 min IM
Peak: 1 h PO; 4–8 h IM
Half-life: 1.5–2 h
Duration: 1–1.5 days PO or IM

ADVERSE EFFECTS

When used at low doses for replacement therapy, or by the topical or intranasal routes, adverse effects of hydrocortisone are rare. However, signs of Cushing’s syndrome can develop with high doses or with prolonged use. If taken for longer than 2 weeks, hydrocortisone should be discontinued gradually. Hydrocortisone possesses some mineralocorticoid activity, so sodium and fluid retention may be noted. A wide range of CNS effects have been reported, including insomnia, anxiety, headache, vertigo, confusion, and depression. Cardiovascular effects may include hypertension and tachycardia. Long-term therapy may result in peptic ulcer disease.

Contraindications: Hydrocortisone is contraindicated in clients with known infections or who are hypersensitive to the drug. Clients with diabetes, osteoporosis, psychoses, liver disease, or hypothyroidism should be treated with caution.

NURSING PROCESS FOCUS Client Receiving Systemic Glucocorticoid Therapy

Assessment

Prior to administration:

- Obtain a complete health history including allergies, drug history, and possible drug interactions.
- Obtain a complete physical examination, focusing on presenting symptoms.
- Determine the reason the medication is being administered.
- Obtain serum sodium and potassium levels, hematocrit and hemoglobin levels, and blood glucose level, and blood urea nitrogen (BUN) and creatinine levels.

Potential Nursing Diagnoses

- Infection, Risk for, related to immunosuppression
- Injury, Risk for, related to side effects of drug therapy
- Knowledge, Deficient, related to drug therapy
- Breast-feeding, Interrupted, related to drug therapy

Planning: Client Goals and Expected Outcomes

The client will:

- Exhibit a decrease in the symptoms for which the drug is being given.
- Exhibit no symptoms of infection.
- Demonstrate an understanding of the drug’s action by accurately describing drug side effects and precautions.
- Adhere to drug and laboratory studies regimen.

Implementation

Interventions and (Rationales)

- Monitor vital signs. (Blood pressure may increase because of increased blood volume and potential vasoconstriction effect.)

Client Education/Discharge Planning

- Instruct client to report dizziness, palpitations, or headaches.
### NURSING PROCESS FOCUS  Client Receiving Systemic Glucocorticoid Therapy (Continued)

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Client Education/Discharge Planning</th>
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<tbody>
<tr>
<td>Monitor for infection. Protect client from potential infections. (Glucocorticoids increase susceptibility to infections by suppressing the immune response.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Avoid people with infection.</td>
<td>- Report fever, cough, sore throat, joint pain, increased weakness, and malaise.</td>
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<td>- Consult with the healthcare provider before receiving any immunizations.</td>
<td>- Never to suddenly stop taking the medication.</td>
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<td>- Notify the healthcare provider of any nonhealing wound or symptoms of infection.</td>
<td>- In proper use of self-administering tapering dose pack.</td>
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<td>- To take oral medications with food.</td>
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<td>Monitor client’s compliance with drug regimen. (Sudden discontinuation of these agents can precipitate an adrenal crisis.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Monitor blood glucose levels. (Glucocorticoids cause an increase in gluconeogenesis and reduce glucose utilization.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Monitor skin and mucous membranes for lacerations, abrasions, or break in integrity. (Glucocorticoids impair wound healing.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Monitor GI status for peptic ulcer development. (Glucocorticoids decrease gastric mucus production and predispose client to peptic ulcers.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Monitor serum electrolytes. (Glucocorticoids cause hypernatremia and hypokalemia.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Monitor changes in musculoskeletal system. (Glucocorticoids decrease bone density and strength and cause muscle atrophy and weakness.)</td>
<td>Instruct client to:</td>
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<tr>
<td>- Monitor emotional stability. (Glucocorticoids may produce mood and behavior changes such as depression or feeling of invulnerability.)</td>
<td>Instruct client to:</td>
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#### Evaluation of Outcome Criteria

Evaluate the effectiveness of drug therapy by confirming that client goals and expected outcomes have been met (see “Planning”).

- The client states that symptoms have decreased.
- The client is free from signs of infection.
- The client demonstrates an understanding of the drug’s action by accurately describing drug side effects and precautions.
- The client verbalizes the importance of adhering to drug and laboratory studies regimen.

See Table 43.4 for a list of drugs to which these nursing actions apply.