

Lippincott's Illustrated Journal of Pharmacology

Pharmacology of glucocorticoids

26.1 Which part of the adrenal gland is correctly paired with the type of substance it secretes?

- A. Adrenal medulla-corticotropin
- B. Zona fasciculata--cortisol
- C. Zona glomerulosa—androgens
- D. Zona reticularis-catecholamines

Correct answer = B. The adrenal medulla secretes catecholamines. Corticotropin is secreted by the anterior pituitary. The zona glomerulosa secretes aldosterone, and the zona reticularis secretes androgens.

26.2 Corticosteroids are useful in the treatment of which of the following disorders?

- A. Cushing syndrome
- B. diabetes
- C. Hypertension
- D. Inflammatory bowel disease

Correct answer = D. Corticosteroids can increase blood pressure and glucose and are not used in the treatment of hypertension or diabetes. Cushing syndrome is an excess secretion of glucocorticoids. Dexamethasone may be used in the diagnosis of Cushing syndrome, but not its treatment. Corticosteroids reduce inflammation and can be used in the management of inflammatory bowel disease.

26.3 Which adverse effect commonly occurs with glucocorticoid therapy?

- A. Glaucoma
- B. Hyperkalemia
- C. Weight loss
- D. Osteoarthritis

Correct answer = A. Glucocorticoid therapy may cause hypokalemia, not hyperkalemia. Glucocorticoids also cause increased appetite and osteoporosis. Glaucoma is a known potential adverse effect of this class.



26.4 Which contributes to osteoporosis with long-term use of glucocorticoids?

- A. Increased excretion of calcium
- B. Inhibition of calcium absorption
- C. Stimulation of the hypothalamic-pituitary-adrenal axis
- D. Decreased production of prostaglandins

Correct answer = B. Glucocorticoid-induced osteoporosis is attributed to inhibition of calcium absorption and bone formation. Increased intake of calcium plus vitamin D and use of bisphosphonates may be indicated. Glucocorticoids suppress rather than stimulate the hypothalamic-pituitary-adrenal axis. The decreased production of prostaglandins does not play a role in bone formation.

26.5 A child with severe asthma is treated with high-dose inhaled corticosteroids. Which adverse effect is of particular concern?

- A. Hypoglycemia
- B. Hirsutism
- C. Growth suppression
- D. Cushing syndrome

Correct answer = C. Corticosteroids may retard bone growth. Chronic use of the medication may lead to growth suppression, so linear growth should be monitored periodically. Hyperglycemia, not hypoglycemia, is a possible adverse effect. Hirsutism and Cushing syndrome are unlikely with the dose that the child receives via inhalation.

26.6 Which is appropriate for treatment of congenital adrenal hyperplasia in a child?

- A. Adrenocorticotrophic hormone (ACTH)
- B. Ketoconazole
- C. Prednisone
- D. Spironolactone

Correct answer = C. Congenital adrenal hyperplasia is seen in infancy and childhood. Because cortisol synthesis is decreased, feedback inhibition of adrenocorticotrophic hormone (ACTH) formation and release is also decreased, resulting in enhanced ACTH formation. This in turn leads to increased levels of adrenal androgens and/or mineralocorticoids. The treatment is to administer a glucocorticoid, such as hydrocortisone (in infants) or prednisone, which restores the feedback inhibition. The other options are inappropriate.



✪✪✪ (26.7) A patient with Addison disease treated with hydrocortisone is experiencing dehydration and hyponatremia.

Which drug is best to add to the patient's therapy?

- A. Dexamethasone
- B. Fludrocortisone
- C. Prednisone
- D. Triamcinolone

Correct answer = B. To combat dehydration and hyponatremia, a corticosteroid with high mineralocorticoid activity is needed. Fludrocortisone has the greatest mineralocorticoid activity of the agents provided. The other drugs have little or no mineralocorticoid activity.

✪✪✪ (26.8) Which strategy is effective to minimize development of HPA axis suppression in a patient with rheumatoid arthritis on long-term high-dose corticosteroid therapy?

- A. Alternate-day administration
- B. Administration via topical or inhalation route when possible
- C. Immediate cessation of the corticosteroid
- D. Administration of two-thirds of the daily dose in the morning and one-third in the afternoon

Correct answer = A. Topical or inhaled corticosteroids may minimize HPA axis suppression, but are unlikely to be effective in rheumatoid arthritis. Since the patient has been on long-term therapy, a taper would be necessary. Administration of two-thirds of the dose in the morning and one-third in the afternoon is a strategy to mimic the normal diurnal variation of cortisol secretion, but it does not prevent suppression of the HPA axis. Alternate-day administration is beneficial.

✪✪✪ (26.9) Which patient is most likely to have suppression of the HPA axis and require a slow taper of corticosteroid therapy?

- A. A patient taking 40 mg of prednisone daily for 7 days to treat an asthma exacerbation.
- B. A patient taking 10 mg of prednisone daily for 3 months for rheumatoid arthritis.
- C. A patient using mometasone nasal spray daily for 6 months for allergic rhinitis.
- D. A patient receiving an intraarticular injection of methylprednisolone for osteoarthritis.

Correct answer = B. Suppression of the HPA axis usually occurs with higher doses of corticosteroids when used for a duration of 2 weeks or more. Although the dose of prednisone is higher in the asthma patient, the duration of therapy is short, so the risk of HPA axis suppression is lower. The risk of HPA axis suppression is low with topical therapies like intranasal mometasone and with one-time joint injections.

✪✪✪ These are high-yield questions just for you to know



26.10 Which corticosteroid is most appropriate to administer to a woman in preterm labor to accelerate fetal lung maturation?

- A. Betamethasone**
- B. Fludrocortisone**
- C. Hydrocortisone**
- D. Prednisone**

Correct answer = A. A corticosteroid with high glucocorticoid activity is needed to speed fetal lung maturation prior to delivery. Betamethasone has high glucocorticoid activity and is one of the recommended drugs in this context. Dexamethasone is the other. Fludrocortisone mainly has mineralocorticoid activity and is not useful in this situation. Hydrocortisone has much lower glucocorticoid activity. Prednisone has a higher glucocorticoid activity than hydrocortisone, but the fetus is not able to convert it to prednisolone, the active form.

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