

Pathophysiology lab exam questions

Laboratory evaluation of the disorders of the adrenal cortex and medulla

1. Laboratory data of a patient with arterial hypertension include increased Na^+ and decreased K^+ concentrations. Urinary aldosterone excretion is twice the normal. What is the most likely diagnosis if plasma renin activity is
 - a) high,
 - b) low?

2. Plasma cortisol level of a patient is lower than normal. Urinary aldosterone excretion is decreased and the patient is hypoglycemic. What is the most likely diagnosis and what tests would you order?

3. A 24-year-old man complains of gradually increasing weakness, weight loss and loss of appetite. He was observed to have bronzed skin, however, he reported no exposure to the sun. He was hypotensive and showed evidence of muscle wasting. The results of the laboratory test included: serum Na^+ 125 mmol/l, serum K^+ 6.2 mmol/l, plasma cortisol: 4 $\mu\text{g}/\text{dl}$ (8:00 a.m.) (decreased), plasma ACTH: increased above normal. An ACTH stimulation test failed to elicit a response in plasma cortisol level. What is the most likely diagnosis?

4. A patient with Cushing's syndrome entered the hospital for diagnostic studies. Baseline plasma cortisol was elevated. A small dose of dexamethasone did not suppress cortisol but 50% reduction occurred when large dose of dexamethasone was given. Plasma ACTH was elevated. What is the most likely diagnosis?

5. A hypertensive male patient enters the hospital for medical evaluation. His blood pressure is 180/95 mmHg; Serum Na^+ : 148 mmol/l; K^+ : 3.5 mmol/l; fasting plasma glucose: 7.2 mmol/l; Baseline plasma cortisol was elevated. A small dose of dexamethasone did not suppress cortisol. A large dose of dexamethasone was given but there was little change in the blood cortisol from baseline values. Plasma ACTH was high. What is the most likely diagnosis?

6. A 40-year-old woman complains of amenorrhea and emotional disturbances, perhaps partially due to her increasing obesity which is concentrated around the chest and the abdomen. Her X-ray studies show evidence of mineral bone loss (osteoporosis). Laboratory results: serum K^+ 3.2 mmol/l, fasting plasma glucose: 7.7 mmol/l, plasma cortisol: 40 $\mu\text{g}/\text{dl}$ (8:00 a.m.) (elevated), plasma ACTH is lower than normal. A large dose of dexamethasone did not suppress the elevated cortisol level. What is the most likely diagnosis?

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7. A young girl develops virilization and hypertension. Plasma cortisol is low, ACTH is elevated.
What is the most likely cause of this condition? How are adrenal production of glucocorticoids, mineralocorticoids and androgens affected?

8. A young boy develops precocious puberty and arterial hypotension. Plasma ACTH is elevated, serum Na^+ is low.
The deficiency of which enzyme is presumably responsible for the the above findings? Urinary excretion of 17-ketosteroids, DHEA and free cortisol are probably normal, low or elevated?

9. A 40-year-old man complains of spells of headache, profuse perspiration (diaphoresis), nausea and palpitations. Arterial blood pressure is markedly elevated. Urinary VMA excretion is increased.
What is the most likely diagnosis? What test would you order to confirm your diagnosis?