

## Adrenal Disease: Review Questions

*Catherine Anastasopoulou, MD, FACE*

### QUESTIONS

Choose the single best answer for each question.

- 1. A 55-year-old man with no prior medical history presents with right flank pain. During an evaluation for kidney stones, he has a computed tomography scan of the abdomen that reveals a 2 × 2-cm mass in the left adrenal gland. The patient's vital signs, kidney function, and electrolyte levels are within normal limits. Which of the following tests should be ordered next to evaluate the adrenal mass?**
  - (A) Aldosterone and renin levels
  - (B) Random cortisol levels
  - (C) Testosterone levels
  - (D) 24-Hour urine collection for metanephrines
  - (E) No further testing
- 2. A 22-year-old woman who previously was healthy presents with dizziness and nausea. Routine blood tests show a blood glucose level of 52 mg/dL. Results of kidney and liver function tests are normal, but the patient's potassium level is slightly elevated. Which of the following tests should be performed next?**
  - (A) Insulin and C-peptide levels
  - (B) Adrenocorticotrophic hormone (ACTH) stimulation test
  - (C) Random cortisol levels
  - (D) Dexamethasone suppression test
  - (E) 24-Hour urine collection for free cortisol

Questions 3 and 4 refer to the following case study.

A 45-year-old man with history of high blood pressure that has been difficult to control with a variety of antihypertensive medications presents with persistent headaches, excessive sweating, and palpitations. Routine blood tests are normal. Electrocardiogram shows supraventricular tachycardia.

- 3. What is this patient's most likely diagnosis?**
  - (A) Pheochromocytoma
  - (B) Primary hyperaldosteronism
  - (C) Cushing's disease
  - (D) Hyperthyroidism
  - (E) Malignant hypertension
- 4. Which of the following is the best initial pharmacologic therapy choice for this patient?**
  - (A)  $\beta$ -Blockers
  - (B) Diuretics
  - (C) Steroids
  - (D) Methimazole
  - (E)  $\alpha$ -Blockers
- 5. A patient with longstanding history of depression is admitted to the psychiatric ward. He complains of weight gain and frequency in urination. A 24-hour urine collection reveals above normal levels of free cortisol, but a dexamethasone suppression test shows normal suppression. What is the most likely diagnosis?**
  - (A) Intermittent Cushing's disease
  - (B) Pseudo-Cushing's disease
  - (C) Diabetes mellitus
  - (D) Medication-induced hyperglycemia
  - (E) Hypothyroidism

*(turn page for answers)*

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*Dr. Anastasopoulou is a staff endocrinologist at Albert Einstein Medical Center, Philadelphia, PA.*

### ANSWERS AND EXPLANATIONS

**1. (D) 24-Hour urine collection for metanephrines.**

This is a case of an “incidentaloma,” a mass found in imaging studies performed for other reasons. Patients usually have no symptoms related to the mass. The majority of these tumors are nonfunctioning, but a work-up is mandatory to ensure that no hormonal dysfunction exists. The usual tests ordered are (1) a 24-hour urine collection for free cortisol to rule out Cushing’s syndrome, (2) a 24-hour urine collection for metanephrines and catecholamines to rule out pheochromocytoma, and (3) depending on the existence of hypertension and electrolytic problems, blood levels of aldosterone and renin to rule out primary hyperaldosteronism.<sup>1</sup>

**2. (B) ACTH stimulation test.** The case patient has symptoms of Addison’s disease, and the best test to confirm this diagnosis is an ACTH stimulation test. Random cortisol levels are not reliable tests for establishing the diagnosis because they can fluctuate throughout the day. Early morning levels of cortisol could give a good initial clue, but they would still need to be confirmed by an ACTH stimulation test. A dexamethasone suppression test is performed when Cushing’s syndrome is suspected, and insulin and C-peptide levels are tested when insulinoma is suspected.

**3. (A) Pheochromocytoma.** Pheochromocytoma should be suspected in a patient with multiple adrenergic symptoms (ie, tachycardia, sweating, anxiety) accompanied by difficult-to-control hypertension. Patients with thyroid disease usually do not suffer from high blood pressure. Patients with Cush-

ing’s syndrome or primary hyperaldosteronism may have other physical and biochemical findings (eg, obesity, hypokalemia).<sup>2</sup>

**4. (E)  $\alpha$ -Blockers.** The key to successful surgical resection of a pheochromocytoma is adequate preparation of the patient. Ideally, at least 2 to 3 weeks of antihypertensive treatment should be given before surgery. Patients first should be given an  $\alpha$ -blocker for at least 10 days before the surgery to control high blood pressure. After the  $\alpha$ -blocker is started, a  $\beta$ -blocker can be added for the control of the heart rate and any arrhythmia. Methimazole is given to patients with hyperthyroidism, and steroids are given to patients with Addison’s disease.<sup>2</sup>

**5. (B) Pseudo-Cushing’s disease.** Pseudo-Cushing’s disease is the most likely diagnosis in a chronically depressed patient with weight gain and increased urinary frequency, and blood tests can confirm this suspicion. The patient also may have a simultaneous diagnosis of diabetes, especially as a side effect of the new medications used by psychiatrists (ie, second-generation selective serotonin reuptake inhibitors), but in this case, cortisol levels should be normal.<sup>3</sup>

### REFERENCES

1. Grumbach MM, Biller BM, Braunstein GD, et al. Management of the clinically inapparent adrenal mass (“incidentaloma”). *Ann Intern Med* 2003;138:424–9.
2. Pacak K, Linehan WM, Eisenhofer G, et al. Recent advances in genetics, diagnosis, localization, and treatment of pheochromocytoma. *Ann Intern Med* 2001;134:315–29.
3. Orth DN. Cushing’s syndrome [published erratum in *N Engl J Med* 1995;332:1527]. *N Engl J Med* 1995;332:791–803.

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