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**QUESTION 1**

Cells in the pancreas that secrete glucagon and insulin are which of the following?

- A. A and B cells
- B. acinar cells
- C. D cells
- D. pancreatic D1 cells
- E. pancreatic polypeptide cells

Correct Answer: A

Section: Anatomy

In the human pancreas, A and B cells of the islets of Langerhans secrete glucagon and insulin, respectively. Pancreatic D1 cells (choice D) release a product similar to vasoactive intestinal polypeptide. Pancreatic polypeptide cells (choice E) secrete pancreatic polypeptide and D cells (choice C) release somatostatin. All the aforementioned cells belong to the endocrine pancreas. Acinar cells (choice B) are part of the exocrine pancreas and do not secrete glucagon or insulin.

QUESTION 2

Potassium supplementation is often necessary for patients taking large doses of which of the following drugs?

- A. amiloride
- B. captopril
- C. hydrochlorothiazide
- D. losartan
- E. spironolactone

Correct Answer: C

Section: Pharmacology Hydrochlorothiazide causes potassium wasting and may lead to hypokalemia requiring dietary potassium supplementation. Potassium wasting is characteristic of diuretics that present more sodium to the collecting tubule, where sodium is conserved in exchange for potassium under the control of aldosterone. Therefore, diuretics that act in the proximal convoluted tubule (carbonic anhydrase inhibitors), ascending limb of the loop of Henle (loop diuretics), and distal convoluted tubule (thiazides) cause potassium wasting and may lead to dangerous hypokalemia. Angiotensin antagonists (because they interfere with aldosterone secretion) and aldosterone inhibitors have the opposite effect. Amiloride (choice A) and spironolactone (choice E) are aldosterone antagonists; captopril (choice B)



and losartan (choice D) are angiotensin antagonists. The latter agents cause potassium retention and may cause hyperkalemia, not hypokalemia.

QUESTION 3

An 18-year-old woman presented with 1 week of history of fever and malaise. She had mild jaundice and elevated temperature. Hemoglobin was 13.8 g/dL, leukocyte count 13×10^9 per liter. Serum bilirubin was elevated (42 mmol/L) and contained 95% unconjugated bilirubin. Liver enzyme tests were normal. Which of the following is the most likely cause of these signs and symptoms?

- A. alcohol poisoning
- B. decreased glucuronyl transferase
- C. increased lactate dehydrogenase (LDH)
- D. excessive hemolysis
- E. obstruction of bile flow

Correct Answer: B

Section: Physiology Glucuronyl transferase is the enzyme that conjugates bilirubin in the liver, after which it is excreted in bile or urine. A hereditary defect in glucuronyl transferase concentration, or activity, is called Gilbert syndrome. It may lead to mild jaundice and general discomfort with typical onset in childhood or early adulthood. Alcohol poisoning (choice A) leads to liver damage, and an elevation of conjugated bilirubin. Abnormalities of liver enzyme tests would be expected. Lactate dehydrogenase (choice C) catalyzes the conversion of lactate to pyruvate as part of cellular energy production. Since many cells including red blood cells are rich in LDH, increased serum LDH levels could point toward excessive hemolysis, but would not be a cause for it. Although hemolysis that exceeds the capacity of the liver to clear bilirubin from serum (choice D) would lead to increased unconjugated bilirubin, it is not the best choice due to the woman's normal hemoglobin (1216 g/dL for females). Obstruction of bile flow (choice E) leads to backup of largely conjugated bilirubin in the blood stream.

QUESTION 4

A 30-year-old previously healthy patient has all the gastrointestinal symptoms of infection with hepatitis A virus (HAV), yet all the tests for HAV-IgG and HAV-IgM are negative. Which of the following is the most likely cause of this infection?

- A. hepatitis B virus
- B. hepatitis C virus
- C. hepatitis D virus
- D. hepatitis E virus
- E. rotavirus

Correct Answer: D

Section: Microbiology/Immunology Hepatitis E virus (choice D) has been tentatively placed in the calicivirus grouping. It



has been found to be the cause of another form of hepatitis and is spread by the oral-fecal route, resembling hepatitis A epidemiology. This virus, like HAV, appears to cause only acute disease and is especially dangerous to pregnant women. This cohort experienced a 20% mortality rate in an Indian outbreak in 1955. No specific diagnostic tests are currently available for HEV diagnosis. Hepatitis B (HBV--choice A) and hepatitis C (HCV-- choice B) are usually spread by means of blood and excellent diagnostic tests exist for these to diagnose specifically or rule out these agents. Hepatitis D virus (HDV--choice C) contains delta-Ag surrounded by HBV surface antigen. HDV must exist in a coinfection with HBV and may present as an acute or chronic infection. Diagnostic tests for HDV also exist. Rotaviruses (choice E) are double-stranded RNA viruses that are usually found in pediatric infections.

QUESTION 5

A patient has begun exhibiting signs of paranoia and psychosis within the past week. In considering the diagnosis of schizophrenia, which of the following is a crucial piece of information?

- A. The patient does not smoke.
- B. The patient has a history of similar psychotic episodes in the past.
- C. The patient has a history of substance abuse.
- D. The patient is a toxicologist.
- E. The patient is single.

Correct Answer: B

Section: Behavioral Science and Biostatistics Although all the other items (choices A, C, D, and E) may be significant, schizophrenia cannot be diagnosed if the patient has never had an episode of psychotic symptoms lasting for at least 6 months.

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