USMLE-STEP-1 Q&As

United States Medical Licensing Step 1

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QUESTION 1

A 78-year-old woman is found to have a first morning urine specific gravity of 1.010. Assuming that she has not had anything to drink since yesterday evening, this is most indicative of which of the following?

A. acute pyelonephritis

B. advanced renal failure

C. diabetic glomerulosclerosis

D. hyperlipidemia

E. normal kidney function

Correct Answer: B

Section: Pathology and Path physiology Aurine specific gravity of 1.010 is the same as the specific gravity of glomerular filtrate (i.e., isosthenuric). Thus, this woman was not concentrating her urine overnight (usual SG > 1.020) which is an indication of severe renal damage as seen in advanced renal failure. Patients with acute pyelonephritis (choice A), diabetic glomerulosclerosis (choice C), and hyperlipidemia (choice D) who are not in advanced renal failure would still be expected to show some overnight concentrating ability as, of course, would normal kidney function (choice E).

QUESTION 2

A 27-year-old graduate student, upon her return from vacation in a tropical area with poor sanitary conditions, became ill. She experienced lower abdominal pain, colitis, tenesmus, flatulence, and bloody diarrhea caused by an RBCcontaining parasite. Which of the following represents the most likely diagnosis?

A. acute amoebic dysentery

B. malaria

C. toxoplasmosis

D. trichomoniasis

E. trypanosomiasis

Correct Answer: A

Section: Microbiology/Immunology The most likely diagnosis of the patient\\'s illness is acute amoebic dysentery, because the classical symptomatology of acute amoebic dysentery is lower abdominal pain, cramping, colitis, tenesmus, flatulence, and bloody diarrhea. Malaria is characterized by periodic fever, fatal cerebral episodes, lysis of red blood cells, and nephritis due to immune complex formation, and is transmitted by mosquito bites (choice B). Trypanosomiasis is transmitted by bites of the tsetse fly and the trypanosomes initially cause chancres at the site of the bite. Then the trypanosomes reach the central nervous system, and the patient has lassitude, develops sleeping episodes, and tissue wasting or even death can occur (choice E). Trichomoniasis is limited to the vagina and is associated with a watery, foul smelling, abundant greenishgray discharge (choice D). Toxoplasmosis is a mild influenza-like disease with possible lymph node enlargement, and may be severe in immunocompromised patients. Congenital infections can damage the eyes or brain and may be fatal (choice C).

QUESTION 3

A 57-year-old man presents with angina. He uses 1 or 2 nitroglycerin tables sublingually when he experiences chest pain. Which of the following drugs may interact to cause serious hypotension if taken 6 hours or less before the nitrate?

A. clonidine

B. diltiazem

C. metronidazole

D. phentolamine

E. sildenafil

Correct Answer: E

Section: Pharmacology Nitrates release nitric oxide in smooth muscle and cause relaxation by facilitating the production of cGMP. Sildenafil (and related drugs for erectile dysfunction, tadalafil and vardenafil) inhibit the inactivation of cGMP. When sildenafil and a nitrate are combined, excessive amounts of cGMP accumulate and may cause severe hypotension. The other drugs listed (choices Athrough D) have no significant interactions with nitrates.

QUESTION 4

A 7-year-old girl presents with a neck mass located at the anterolateral aspect of the neck, anterior to the sternocleidomastoid muscle. A biopsy of the lesion revealed a largely cystic mass lined by stratified squamous epithelium surrounded by an underlying dense layer of lymphoid tissue with germinal centers. Based on these findings, what is the most likely diagnosis?

A. branchial cleft cyst

B. granulomatous lymphadenitis

C. Hodgkin lymphoma

D. metastatic laryngeal carcinoma

E. thyroglossal duct cyst

Correct Answer: A

Section: Pathology and Path physiology A cystic structure in the lateral neck lined by squamous or, less usually, columnar epithelium and surrounded by lymphoid issue with germinal centers is invariably a branchial cleft cyst. Granulomatous lymphadenitis (choice B) should demonstrate granulomatous inflammation in a lymph node which is not described here. Hodgkin lymphoma (choice C) occurs in five subtypes, none of which is associated with epithelial tissue. Metastatic laryngeal carcinoma (choice D) is usually squamous cell in origin and would demonstrate pleomorphic polygonal cells with "prickles" and "pearls." A thyroglossal duct cyst (choice E) can have a histological appearance very similar to that of a branchial cleft cyst but the most important difference is the midline location of the thyroglossal duct cyst.

QUESTION 5

Which of the following acts as a folate antagonist in the treatment of malaria?

A. amodiaquine

B. chloroquine

C. mefloquine

D. proguanil

E. quinine

Correct Answer: D

Section: Pharmacology Proguanil is a prodrug that is converted to cycloguanil, an inhibitor of malarial dihydrofolate reductase. Amodiaquine (choice A) and chloroquine (choice C) are similar and probably interfere with metabolism of heme in the vacuoles of the parasite. Mefloquine (choice C) and quinine (choice E) have unknown mechanisms of action but are not folate antagonists.