

USMLE Step 3: Next step for patient with chest pain

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If you're preparing for the United States Medical Licensing Examination® (USMLE®) Step 3 exam, you might want to know which questions are most often missed by test-prep takers. Check out this example from Kaplan Medical, and read an expert explanation of the answer. Also check out all posts in this series.

This month's stumper

A 35-year-old man comes to the emergency department with a two-day history of sharp chest pain that has been getting progressively worse. The pain increases when he is supine and improves when he sits upright. He has never had pain like this before, and he denies dyspnea, diaphoresis, nausea or presyncope. He does not smoke, has no chronic medical conditions and has no family history of coronary artery disease.

The patient is an avid jogger and was running three to five miles every day up until the pain began two days ago. Upon further questioning, you discover that he had a recent upper respiratory tract infection that resolved approximately five days ago. His temperature is 37.6 °C (99.7 °F), blood pressure is 120/82 mm Hg, pulse is 95/minute and respirations are 14/minute. Physical examination shows a triphasic cardiac rub. A chest x-ray is normal, and an electrocardiogram shows diffuse ST-segment elevation with ST-segment depression in aVR.

Which of the following is the most appropriate next step in management?

- A. Administer nonsteroidal anti-inflammatory agents.
- B. Obtain an echocardiogram.
- C. Obtain serial cardiac enzymes.

- D. Order serologies for coxsackie B virus.
- E. Treat the patient with a second-generation cephalosporin.

The correct answer is A.

Kaplan Medical explains why

The patient has acute pericarditis, which is purely a clinical diagnosis. There is no single serologic or imaging test that confirms the diagnosis. The classic pleuritic chest pain that worsens when supine, the pericardial friction rub on exam and the diffuse ST-segment elevation on ECG together make the diagnosis. Acute pericarditis may occur around the time of a known viral or upper respiratory tract infection and may itself be accompanied by fever. If the diagnosis remains uncertain, serologic markers of inflammation (such as an elevated white count, erythrocyte sedimentation rate or C-reactive protein) may help make the diagnosis.

The pericardial rub is classically "triphasic." The three components come from atrial systole, ventricular systole and ventricular relaxation during ventricular diastole. The treatment is nonsteroidal anti-inflammatory drugs (NSAIDs). Naproxen and indomethacin are most often used, but there are no data to demonstrate that any one NSAID is superior to another. There are also scant data on duration of therapy, but a seven- to 14-day course is reasonable. The patient should follow up with a physician during that time frame to ensure that the pericarditis has resolved.

Why the other answers are wrong

Choice B: An echocardiogram is incorrect because there is no evidence of congestive heart failure or hemodynamic compromise. Echocardiogram is neither sensitive nor specific for the diagnosis of acute pericarditis and should therefore not be used to rule in or rule out the disease. While pericarditis can sometimes lead to a significant pericardial effusion and rarely to pericardial tamponade, the patient had no evidence of pericardial tamponade on history, no shortness of breath on exam, no hypotension, distended neck veins or pulsus paradoxus.

Choice C: While myocardial infarction should always be on the differential diagnosis for any patient presenting with chest pain, obtaining serial cardiac enzymes is incorrect for several reasons. First, he has no risk factors for coronary artery disease. He is young, has no known hypertension or high cholesterol, does not smoke, nor does he have a family history of coronary artery disease. He jogs regularly without difficulty.

The quality of his chest pain (sharp and changing with position) would be atypical for ischemic pain. The diffuse ST segment elevation on electrocardiogram is classic for pericarditis and would have to represent the unlikely, simultaneous involvement of several coronary arteries to reflect an acute myocardial infarction.

Choice D: In the majority of cases, acute pericarditis is idiopathic. Obtaining serologies for coxsackie B virus is incorrect because, while coxsackie B is the most common known infectious etiology of acute pericarditis, the presence or absence of the disease does not change management.

Choice E: Treating the patient with a second-generation cephalosporin is incorrect because acute pericarditis is rarely of bacterial etiology. In cases where the etiology is bacterial, patients will typically present quite ill, with fever and other systemic signs or symptoms pointing to a specific disease process.

For more prep questions on USMLE Steps 1, 2 and 3, view other posts in this series.