Gout: Review Questions

Neil J. Gonter, MD

Figure 1. Second, third, and fourth digit on the right hand of the patient described in questions 1 to 3.

Figure 2. Photograph of the left elbow of the case patient described in questions 4 and 5.

QUESTIONS

Choose the single best answer to each question.

Questions 1 to 3 refer to the following case.

An 88-year-old man presents to his primary care physician complaining of difficulty holding the phone with his right hand. He reports chronic morning stiffness that lasts 1 hour, but he has had no recent episodes of acute swelling. Examination of the patient's right hand reveals swelling and several hard nodules across the third digit (**Figure 1**). His past medical history is notable for chronic kidney disease, with the most recent laboratory tests demonstrating a serum creatinine level of 2.9 mg/dL (normal, 0.6–1.2 mg/dL), and a long history of "rheumatism."

1. **Which of the following should be obtained to most accurately diagnose this patient's condition?**
   (A) 24-Hour urine collection for uric acid
   (B) Microscopic examination of tissue aspirate
   (C) Radiographs of the patient's hands
   (D) Rheumatoid factor
   (E) Serum uric acid level

2. **Once a diagnosis of gout is confirmed, goals of therapy should include which of the following?**
   (A) Decrease the serum uric acid level to less than 4.0 mg/dL
   (B) Decrease the serum uric acid level to less than 6.0 mg/dL
   (C) Decrease the serum uric acid level to less than 8.0 mg/dL
   (D) Normalize the erythrocyte sedimentation rate

3. **What therapy should be used in the management of this patient?**
   (A) Allopurinol
   (B) Indomethacin
   (C) Intravenous (IV) colchicine
   (D) Prednisone
   (E) Probenecid

Questions 4 and 5 refer to the following case.

A 63-year-old male construction worker presents to the primary care physician with difficulty using his left elbow over the past few days. He states that he is unable to bend it easily and it is hot to the touch and painful. On examination, the elbow is red, swollen, and tender to light touch (**Figure 2**). There are no other areas of

Dr. Gonter is an assistant clinical professor of medicine, Columbia University, New York, NY, and a practicing rheumatologist, Rheumatology Associates of North Jersey, Teaneck, NJ.

swelling or erythema. He denies fever, recent trauma, or previous history of joint problems. He drinks a 6-pack of beer daily and smokes 1 pack of cigarettes per day. He states that his father and 2 brothers have gout.

4. **What is the first step in the management of this patient?**
   (A) Aspirate the olecranon bursa
   (B) Prescribe pain medication
   (C) Radiography of the elbow
   (D) Start antibiotics
   (E) Start colchicine

5. **Aspiration reveals thick yellow fluid. Microscopic examination of the aspirate reveals many white blood cells, red blood cells, and thin, needle-shaped crystals that are both intracellular and extracellular. What is the next step in this patient's management?**
   (A) Inject steroids
   (B) Start allopurinol
   (C) Start antibiotics
   (D) Start oral colchicine

6. **A 55-year-old man presents to the medical residents' clinic with a complaint of "the longest gout attack of my life." Physical examination is notable for several hot, swollen, and tender metacarpophalangeal and metatarsophalangeal joints bilaterally. The patient was diagnosed with gout 10 years ago. He usually has 1 to 2 acute gout attacks per year, which are typically treated with indomethacin with resolution after 3 to 5 days. At his last clinic visit 3 weeks ago, the patient was noted to have tophi on both elbows as well as several on the peripheral and distal interphalangeal joints. Laboratory tests revealed a uric acid level of 7.6 mg/dL (normal, 4.0–8.0 mg/dL), and kidney function was normal. He was prescribed allopurinol 300 mg daily. How should this patient be managed at this time?**
   (A) Add acetaminophen to this patient's current medication regimen
   (B) Check the patient's uric acid level and increase the dose of the allopurinol if the uric acid level is still high
   (C) Start colchicine and indomethacin twice daily
   (D) Stop the allopurinol because it should not be taken during an acute attack

ANSWERS AND EXPLANATIONS

1. **(B) Microscopic examination of tissue aspirate.** Although most of the choices can be helpful in diagnosing gout, the gold standard for diagnosis is direct visualization of uric acid crystals under a microscope. This is easily done by obtaining a small amount of aspirate from a swollen joint or, in this case, a tophus. A uric acid level obtained by a 24-hour urine collection may be normal or elevated in patients with gout, as can a serum uric acid level.[1] Radiographs may show classic changes of gouty bone erosions, such as "rat bite" or overhanging edges; however, they cannot establish the diagnosis irrefutably. Rheumatoid factor appears to become elevated with age, but this measurement on its own does not denote any specific condition.

2. **(B) Decrease the serum uric acid level to less than 6.0 mg/dL.** Decreasing the serum uric acid level is an important (and often overlooked) part of gout management. The maximum solubility of urate in serum is approximately 6.7 mg/dL. After initiating uric acid–lowering therapy, it is important to recheck the patient's serum uric acid level to ensure that the goal is reached. At levels less than 6.0 mg/dL, uric acid stops accumulating in soft tissues and joints and the total body uric acid load begins to decrease. If uric acid remains high, uric acid–lowering therapy should be adjusted and the patient should be re-evaluated.[2]

3. **(A) Allopurinol.** Because this patient is not currently experiencing an attack of gout, there is no need for acute therapy (eg, prednisone, indomethacin, IV colchicine). IV colchicine should not be used in patients with renal failure, and therefore its use would be contraindicated in this patient.[3] Similarly, indomethacin is a poor choice in this patient given his age and decreased kidney function. Although often forgotten, probenecid can be used as a uric acid–lowering agent; however, it is only beneficial in patients who undersecrete uric acid (24-hour uric acid level < 800 mg) and have a creatinine clearance greater than 60 mg/dL. Allopurinol should be used with caution and at a reduced dose in patients with decreased renal function.

4. **(A) Aspirate the olecranon bursa.** It is extremely important to obtain aspirate from a patient who presents with a swollen bursa, especially in cases in which 1 joint or bursa is more remarkable than the others. Fluid should be sent for cell count and culture and should be examined for crystals. Crystals characteristic of gout are thin and needle-shaped and are often intracellular as a result of leukocyte phagocytosis. Even if uric acid crystals are found in the aspirate, obtaining a culture is important to ensure that an

infection is not the cause of the patient's symptoms. It is important to note that patients with chronic gout often have uric acid crystals in the bursa or synovial fluid, even when an attack is not occurring.[4] Radiography may be performed to verify that there are no fractures, but it is not an immediate necessity in this case. If infection is suspected, antibiotics should be started as soon as possible. However, just as in septic arthritis, aspiration and cultures should be obtained to target the proper bacteria. Pain medication and colchicine are important but should not be the first priority in this situation.

5. **(C) Start antibiotics.** Although it appears that this patient has acute gout, infection should be carefully considered, particularly because there is no prior history of an acute inflamed bursa or joint. If the results of culture rule out infection, then the olecranon bursa can be injected safely with steroids to help minimize pain and swelling. Oral colchicine can be administered concurrently with antibiotic treatment; however, many rheumatologists avoid aggressive colchicine treatment due to the side effects (ie, diarrhea).[5] Allopurinol should not be started during an acute attack because it can prolong or worsen the attack.

6. **(C) Start colchicine and indomethacin twice daily.** The patient was correctly started on allopurinol for tophaceous gout. However, many patients will stop taking allopurinol upon experiencing a flare. Attacks of gout frequently occur as the serum uric acid drops below the saturation level (~ 6.7 mg/dL) and uric acid that has coated joints and tissues moves away from the affected sites to enter the circulation and exit the body. Any action that causes shifts in uric acid levels will enhance gout flares; therefore, allopurinol should not be stopped or adjusted during an attack. Before initiating any uric acid–lowering therapy for gout, it is important to explain to patients that therapy should not be discontinued without consulting a physician. Attacks of gout can be minimized with a prophylactic dose (0.6 mg) of colchicine twice daily (and in lower doses in patients with renal insufficiency) usually maintained for up to 6 months after initiating uric acid–lowering therapy.[6] Most patients will not experience any gastrointestinal toxicity at this dose. Acetaminophen may help the patient with mild analgesia; however, it is unlikely to be strong enough to be effective.

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