ACUTE GOUT FOR THE HOSPITALIST

Epidemiology:
- Prevalence: affects >3% of US adults[1]
- Men > women (5.9% of adult men vs 2.7% of adult women).[1]
- Risk factors: Increased age, alcohol, high purine diet (seafood, red meat), fructose consumption, chronic kidney disease (CKD), metabolic syndrome, medications (loop diuretics, hydrochlorothiazide [HCTZ], tacrolimus).
- Precipitants: Hospitalization, myocardial infarction, trauma, sepsis.

Symptoms:
- Sudden onset of mono- or oligoarticular (rarely polyarticular) with acute pain, erythema and swelling.
- Classically occurs in 1st metatarsophalangeal (MTP), but can involve other joints, such as ankles, knees, hands, or wrists.

Signs:
- Hot, swollen, red, acutely tender joint(s).
- Tophi (monosodium urate crystal deposition into soft tissues), classically on extensor surfaces of elbow, helix of ear, Achilles tendon.
- "Gouty cellulitis" is inflammation of skin and soft tissues that may mimic infectious cellulitis, especially in the midfoot.

Differential Diagnoses:
- Septic arthritis
  - *In a case of acute monoarthritis always assume to be septic arthritis until ruled out.*
- Pseudogout (Calcium Pyrophosphate Deposition Disease [CPPD])
- Cellulitis
- Fracture

Investigations:
- Arthrocentesis with synovial fluid analysis is the gold standard:
  - ✓ STEP 1: Send aspirated synovial fluid for evaluation of crystals, cell count with differential, Gram Stain and culture.
  - ✓ STEP 2: If crystals are present, determine the type
    - Negatively birefringent, needle-shaped crystals indicate gout.
    - Positively birefringent, rhomboid shaped crystals indicate CPPD.
  - ✓ STEP 3: If Gram stain is positive for organisms, treat as septic arthritis. May taper antibiotics per cultures.
  - ✓ STEP 4: Evaluate white blood cell (WBC) count
    - WBCs <2000 → Noninflammatory
    - WBCs 2000 – 50,000 → Inflammatory
    - WBCs >50,000 → Assume septic arthritis and treat with antibiotics. May taper antibiotics per cultures. Remember gout and infection can co-exist.
- Complete Blood Count (CBC), Complete Metabolic Panel (CMP) to assess renal and liver function and to evaluate for systemic signs of infection or inflammation.
- Serum uric acid can be low, high, or normal during a flare.
- Limited use, but radiographs can be used to rule out fracture.
- Joint ultrasound will show *double contour sign*, which is a hyperechoic linear density overlying the surface of joint cartilage parallel to the subchondral bone.

Acute Treatment Options:

- Initiate one of the treatment options based on patient factors (see Table 1).
- Continue any ongoing urate lowering therapy (ULT) during a flare.

NSAIDs: • Indomethacin 50 mg BID for 5-7 days, discontinue 2-3 days after symptoms resolve. • Naproxen 500 mg BID for 5-7 days, discontinue 2-3 days after symptoms resolve.	-Avoid in patients with renal impairment, history of GI bleed or gastric/duodenal ulcer, concurrent anticoagulation, cirrhosis, moderate-severe decompensated CHF.
Colchicine: • Day 1: 1.2 mg PO at the first sign of flare, followed by 0.6 mg PO after 1 hour (max total dose 1.8 mg/day on day 1). • Day 2 and after: 0.6 mg PO once or twice daily until flare resolves; may be beneficial to continue 2-3 days following flare resolution.	-May be less effective if started >24-36 hrs into an attack -Avoid in combined renal and hepatic impairment, allergy to colchicine, concurrent use of certain medications (such as amiodarone, carvedilol, azithromycin, ketoconazole, etc.)
Steroids: • *Systemic:* prednisone 30-40 mg/day until symptom improvement, then taper gradually as tolerated. • *Intraarticular:* Dosing and choice of steroid dependent on joint involved, availability and clinician choice.	-*Systemic:* Avoid in brittle diabetics, glucocorticoid intolerance, suspected concurrent infection. Caution in advanced CHF. -*Intra articular:* Avoid if >2 joints involved, infection suspected.
Anakinra: • 100 mg SC daily until symptoms improve (typically 3-5 days).	-Can be used when other options are contraindicated. -Often expensive, only available inpatient.

Table 1. Considerations in Management of Acute Gout[2]
*Dosing for medications in this table were obtained from UpToDate

Discharge:

- Consider switching HCTZ to an alternative antihypertensive agent prior to discharge
- Counsel patients to avoid alcohol, high fructose beverages and diets high in purines (i.e., shellfish and red meat).
- Encourage weight loss program at discharge for patients with gout and obesity.[3]

Clinical Pearls:

- Gout more often affects men than women. Older age, metabolic disease, CKD, alcohol use and high purine diet are all predisposing factors.
- Arthrocentesis is gold standard for gout diagnosis.
- In patients with acute monoarthritis, must assume septic arthritis until proven otherwise.
- Gout can co-occur with infection and so must have low threshold to treat with antibiotics.

References:

1. Zhu Y, Pandya BJ, Choi HK. Prevalence of gout and hyperuricemia in the US general population: the National Health and Nutrition Examination Survey 2007-2008. Arthritis Rheum. 2011 Oct;63(10):3136-41. doi: 10.1002/art.30520. PMID: 21800283.
2. Gaffo AL. Initial management of gout flare for patients with known diagnosis of gout*. UpToDate. April 7, 2022.
3. FitzGerald JD, Dalbeth N, Mikuls T, et al. 2020 American College of Rheumatology Guideline for the Management of Gout [published correction appears in Arthritis Care Res (Hoboken). 2020 Aug;72(8):1187] [published correction appears in Arthritis Care Res (Hoboken). 2021 Mar;73(3):458]. Arthritis Care Res (Hoboken). 2020;72(6):744-760. doi:10.1002/acr.24180