Gout

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Risk

- Overall incidence: 0.05% in the USA population
- Most common inflammatory joint disease among men
- Associated with nephropathy, most commonly nephrolithiasis (10–40% of pts)
- Also associated with CV disease, specifically an increased risk of myocardial infarction, but also including heart failure, cerebrovascular accident, transient ischemic attack, and peripheral vascular disease
- Metabolic syndrome
- Hypertension
- Chronic renal dysfunction

Perioperative Risk

- Medication toxicity and side effects
- Comorbid conditions associated with chronic hyperuricemia
- Tophi or gouty joint location considerations

Overview

- Disorder of purine metabolism resulting in urate crystal deposition in and around the joints due to long-standing hyperuricemia
- Largely due to inefficient renal urate excretion

Etiology

- Uric acid is the final metabolite of purine metabolism.
- Urate is largely present as monosodium urate due to high Na content of the extracellular compartment.
- When urate concentrations exceed 380 umol/L, risk of monosodium nitrate crystal formation and precipitation increases.
- Urate production depends on balance between de-novo synthesis in cells, recycling, purine ingestion, and degradation function of xanthine oxidase.
- Diseases such as lymphoproliferative disorders, psoriasis, and hemolytic anemia are associated with high nucleic acid turnover and hyperuricemia.
- Acute gouty arthritis begins with a single joint in lower limbs, usually the first metatarsophalangeal joint. The next most frequent initial joints are midtarsal, ankles, knees, and arms.
- The affected joint becomes warm, swollen, erythematous, and tender.
- Differential diagnosis includes a septic joint.
- Subsequent attacks last longer, affect multiple joints, and spread to upper limbs.
- Gouty attack triggers include alcohol, meat and seafood, fasting, trauma, surgery, and drugs, including diuretics, low-dose aspirin, and organ transplant immune suppressants.
- Chronic gout is characterized by chronic destructive polyarticular involvement with low-grade joint inflammation, joint deformity, and tophi, which are monosodium urate crystals surrounded by mononuclear and giant cell reactions.
- Tophi can occur anywhere in the body, commonly in helix of ear or over the olecranon process, but rarely found in the spinal cord, flexor tendons of hand, vocal cords, heart, and colon.
- Analysis of the synovial fluid or tophus for identification of monosodium urate crystals is the gold standard diagnostic method.

Usual Treatment

- For acute attack, indicate ice, rest, colchicines, or NSAIDs for 1–2 wk.
- Oral prednisone and indomethacin may also be used for acute attacks.
- Urate lowering therapy is then used to maintain urate levels below saturation point. Therapy dissolves crystals and cures gout.
- Urate lowering therapy is indicated for pts with recurrent attacks, chronic arthropathy, tophi, and kidney stones.
- Allopurinol is the initial drug of choice, which lowers uricemia through inhibition of xanthine oxidase.
- Probenecid, sulfinpyrazone, and benzbromarone are second line agents and function by increasing urinary urate excretion.
- Drug considerations:
  - Chronic NSAID use is associated with chronic renal impairment, GI bleeding, and CV adverse events.
  - Colchicine has a narrow therapeutic index, and dose dependent GI toxicity is common.
  - Colchicine toxicity may result from interactions with diltiazem, verapamil, clarithromycin, and ketoconazole.
  - Allopurinol adverse events include rash, GI, and allopurinol hypersensitivity syndrome (characterized by toxic epidermal necrolysis, exfoliative dermatitis, fever, and renal failure).
  - Adjust allopurinol dose for chronic renal failure pts.
  - Febuxostat adverse events include liver function test abnormalities, diarrhea, headache, musculoskeletal signs, and rare CV events.
  - Pegloticase adverse events include infusion related reactions, headache, nausea, and rare CV events.
  - Probenecid adverse events include rash, headache, GI symptoms, and rarely nephrotic syndrome.

Assessment Points

System	Effect	Assessment by Hx	PE/Clinical Sequelae	Test
CV	Increased risk of MI, TIA, CVA, CHF, PVD Febuxostat: Increased risk of CV events NSAID: Fluid overload in CHF	Symptoms of angina or CHF Hx of ischemic or congestive heart disease Hx CHF	S3, rales, JVD S3, rales, JVD	ECG, ECHO, stress ECG ECHO
GI	NSAID: Increased risk of GI bleeding Colchicine: Nausea, vomiting Febuxostat: Diarrhea Benzbromarone: Hepatotoxicity	Chronic NSAID use		
RENAL	Risk of nephrolithiasis and chronic renal impairment NSAID: Chronic renal impairment Colchicine: Nephropathy			Cr, BUN, GFR
HEME	NSAID: Risk of bleeding	Anticoagulant use (e.g., warfarin)		
MS	Tophus	Painful joint	Warm/painful joint or nodular soft tissue structure	Joint fluid aspiration and analysis
IMMUNE	Allopurinol: Hypersensitivity syndrome			HLA-B5801 genotype testing

Key References: Stamp L: Safety profile of anti-gout agents: an update, *Curr Opin Rheumatol* 26(2):162–168, 2014; Nunes EA, Rosseti AG Jr, Ribeiro DS, Santiago M: Gout initially mimicking rheumatoid arthritis and later cervical spine involvement, *Case Rep Rheumatol* 2014:357826, 2014.

Perioperative Implications

Preoperative Preparation

- Pts with long-standing gout are at higher risk for CV events and metabolic abnormalities, including diabetes, and appropriate preop workup should be performed.
- Airway considerations: Pts with chronic gout may have tophi located anywhere in the body, rarely located on the spinal cord, spine, vocal cords, and heart; thus consideration must be taken prior to any procedure.
- GI prophylaxis should be considered for pts on chronic NSAIDs or corticosteroid therapy, due to a high likelihood of developing stomach ulcers from the stress of surgical procedures. H_2 blockers or PPIs can be given for prophylaxis.

Monitoring/Induction/Maintenance

- Standard ASA monitors with supplementation of invasive monitoring if risk factors are present.
- Pts with long-standing gout may have coexisting nephropathy. Consideration should be made to adjust the dose of renally cleared paralytics and analgesics.
- Medications should be considered for not only drug interactions (colchicine with diltiazem, verapamil), but triggers for acute gout attack (diuretics, aspirin, and organ transplant immune suppressants).
- Careful consideration should be taken during positioning where active gout is present, and care should be taken to protect these joints.

Extubation

- Routine unless pt has a known difficult airway.

Postoperative Period

- Clinician should be aware that surgery or trauma can trigger an acute gouty attack.
- Adequate pain control.