GLOMERULONEPHRITIS FOR DUMMIES


Take home points:
1. Don’t freak out when you have a patient with possible glomerulonephritis – the differential diagnosis can be straightforward if you use a systematic approach.
2. The ddx of intrinsic renal disease is: glomerular, tubular, interstitial, or vascular
3. Glomerulonephritis presents with an active sediment (RBC, protein) and nephrotic syndrome presents with a bland sediment (heavy protein, otherwise negative U/A).
4. The serum complements is the next step in diagnosing the cause of glomerulonephritis.

Step 1: Determine the broad cause of the acute or progressive renal failure
- Pre-renal, intrinsic renal, or post-renal
- FENa (if oliguric – to differentiate pre-renal from ATN), U/A (to look for an active sidement), and renal ultrasound (to rule out obstruction) can be helpful
- If intrinsic renal, then your differential diagnosis is:
  - Glomeruli (e.g. glomerulonephritis or nephrotic syndrome or both)
  - Tubules (e.g. ATN)
  - Interstitium (e.g. acute interstitial nephritis (AIN))
  - Vessels (e.g. atheroembolic renal disease, PAN)

Step 2: If you’ve determined it’s a glomerular cause of renal failure, differentiate a glomerulonephritis (GN) pattern from a nephrotic syndrome pattern
- At this step, you must get a urinalysis, renal ultrasound, 24 hour urine protein and creatinine, spot urine protein and creatinine (for protein:creatinine ratio)
- Glomerulonephritis – look for active sediment (U/A with protein and RBCs, dysmorphic RBCs, and/or RBC casts), 300 mg - 3.5 g/day proteinuria, HTN, edema
- Nephrotic syndrome – look for anasarca, heavy proteinuria (more than 3.5 g/day), and a bland sediment on U/A (no RBCs). Patients with true nephrotic syndrome (and not just heavy proteinuria) will have hyperlipidemia, lipiduria, hypoalbuminemia and a hypercoagulable state (seen most often in membranous nephropathy).
- Membranoproliferative glomerulonephritis (MPGN) can present as nephrotic syndrome, glomerulonephritis or both.

Step 3: Use the serum complement levels to look help differentiate causes of GN.
- Normal serum complement levels indicate that the production of complement is keeping up with consumption (normal complements doesn’t mean that complement is not involved in the underlying disease process).
- Once you have the complement levels back, differentiate the GN further by looking for systemic diseases vs. isolated renal diseases.

Low complement GN:
- Systemic: SLE, endocarditis, cryoglobulinemia, shunt nephritis
- Isolated renal: post-infectious GN, MPGN

Normal complement GN:
- Systemic: HSP, ANCA-associated (Wegener’s, PAN), Goodpasture’s syndrome, hypersensitivity vasculitis
- Isolated renal: IgA nephropathy, anti-GBM disease, RPGN