النادي الطبي

GENITOURINARY SYSTEM

SUBJECT : Pathology

LEC NO. : Summary L3

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وَقُل رَّبِّ زِدْنِي عِلْمًا

Nephritis / nephritic syndrome

- Inflammation of the kidney, proliferation of the cells in glomeruli& leukocyte infiltrate → escape of RBCs into urine → ⬆GFR, symptoms include PHAROH » proteinaria (< 3.5 g), hypertension (fluid retention), azotemia (increase creatinine and area), RBC cast, oliguria, hematuria

1. Acute Post infectious (Post streptococcal) Glomerulonephritis (PSGN) :—

- deposition of immune complexes, Ag could be endogenous (SLE) exogenous (streptococcal), develops in children 1 to 4 weeks after they recover from group A strains of β-hemolytic streptococcal infection in the pharynx or skin (no direct infection)
- Phathogenesis » granular deposits of IgG & complement on the GBM, hypocomplementemia
- Light microscope » diffuse uniform increased cellularity of the G (caused by swelling & proliferation), necrosis of the capillary walls, crescents in response to severe inflammatory injury
- Immunoflourescence » granular deposits of IgG & complement it's cleared in about 2 months, bumpy pattern because of the focal nature of the immune complex deposition process
- Electron microscope » immune complexes subepithelial humps
- Clinically » acute, gross hematuria with smoky brown urine, mild proteinuria., periorbital edema, serum complement levels are low

2. IgA Nephropathy (Berger Disease) :—

- one of the most common causes of recurrent microscopic or gross hematuria, deposition of IgA in the mesangium, children & young adult, 50% gross hematuria (occurs within 1 or 2 days of a nonspecific upper RTI, UTI) it lasts for several days then it returns
- Pathogenesis » IgA the main immunoglobulin in mucosal secretions has low levels in normal serum. IgA is ⬆ 50% of patients with IgA nephropathy due to ⬆production in bone marrow (in response to respiratory or GIT exposure to environmentalagents), genetic influence, deposition of IgA immune complexes in the mesangium which activate alternative complement pathway & initiate G injury, some cases defective clearance of IgA with liver disease or with cealiac disease
- Morphology » LM: variable, mesingial widening , IF: mesangial deposition of IgA with C3, EM: deposits in mesangium

3. Rapidly Progressive (Crescentic) Glomerulonephritis :—

- not a specific etiologic form of GN, clinical syndrome characterized by rapid & progressive loss of renal function with features of nephritic syndrome, severe oliguria if untreated death from RF within weeks to months, histologic picture characterized by presence of crescents (name after shape they fill Bowman's space), proliferation of parietal epithelial cells of Bowman's capsule in response to injury, infiltration of monocytes and macrophages, progresses to azotemia
- Pathogenesis » immunologically mediated, caused by different diseases some restricted to the kidney and others systemic, 3 groups » all have severe G injury, in such group diseases could be idiopathic, well-defined renal or extrarenal disease
- Group A (Anti-Glomerular BM Antibody): 12% of cases » idiopathic (there is renal involvement in the absence of pulmonary disease), goodpasture syndrome (renal & pulmonary involvement, bind to GBM and to pulmonary alveolar capillary BM, causing pulmonary hemorrhages), Anti-GBM Antibody, linear deposits of IgG & C3, patients benefit from plasmapheresis or which removes pathogenic Abs from circulation
- Group B (Immune Complex): 44% of cases » idiopathic, infection/ post infection related, SLE, IgA nephropathy, complication of any of immune complex nephritis, sometimes idiopathic, granular lumpy bumpy pattern
- Group C (Pauci-Immune): Antineutrophil cytoplasmic antibody (ANCA) associated: 44% of cases » in many cases it's idiopathic, in some cases systemic vasculitis such as microscopic polyangitis or Wegener granulomatosis, lack of anti-GBM Abs or significant immune complex, anti-neutrophil cytoplasmic Abs,
- Morphology » cortical petechial hemorrhages, proliferation of parietal epithelial cells of Bowman's capsule in response to injury & exudation of plasma proteins including fibrin into Bowman's space, migration & infiltration of monocytes /macrophages into Bowman's capsule
  Capillary loops are markedly thickened wire loop lesion of lupus nephritis
- Immunoflourescence » positivity with antibody to fibrinogen with progressive GN, the glomerular damage is so severe that fibrinogen leaks into Bowman's space

4. Hereditary nephritis :—

- mutations in GBM proteins, Alport syndrome, GBM is largely composed of type IV collagen crucial for normal function of lens & cochlea, not immunologically mediated
- Morphology » unremarkable until late in the course, foamy appearance as result of accumulation of neutral fats (foam cells)
- Pathogenesis » mutation of any one of the a chains of type IV collagen, renal failure 20-50 yrs
- Electron microscope » GBM thin and attenuated, GBM develops splitting and lamination "basket-weave" appearance
- Clinically » inheritance is heterogeneous, most commonly X-linked, males tend to be affected more frequently, more severely, more likely to develop RF than females, patients age 5 to 20 years with gross or microscopic hematuria and proteinuria,

Disease	Presentation	Age	LM	IF	EM	Prognosis
MCD	nephrotic	Children	none	negative	Effaced foot processes	good
FSGS	nephrotic	adults	Segmental sclerosis	negative	Effaced foot processes	Poor?
MNP	nephrotic	adults	Thickened GBM	IgG+ C3+	Sub-epithelial spikes and domes	Poor?
MPGN-type1	Nephritic/ nephrotic	adults	Tram track	Ig s	Subendothelial deposits	poor
MPGN-type2	Nephritic/ nephrotic	adults	Tram track	C3+	Dense deposits	poor
IgA nephropth	nephritic	Children, young adults	variable	IgA+	Mesangial deposits	variable
PSGN	nephritic	children	hypercellularity	IgG+ C3+	Subepithelial deposits (humps)	good
Alport syndrome	hematuria, hearing loss	children	variable	negative	Basket weave GBM	poor