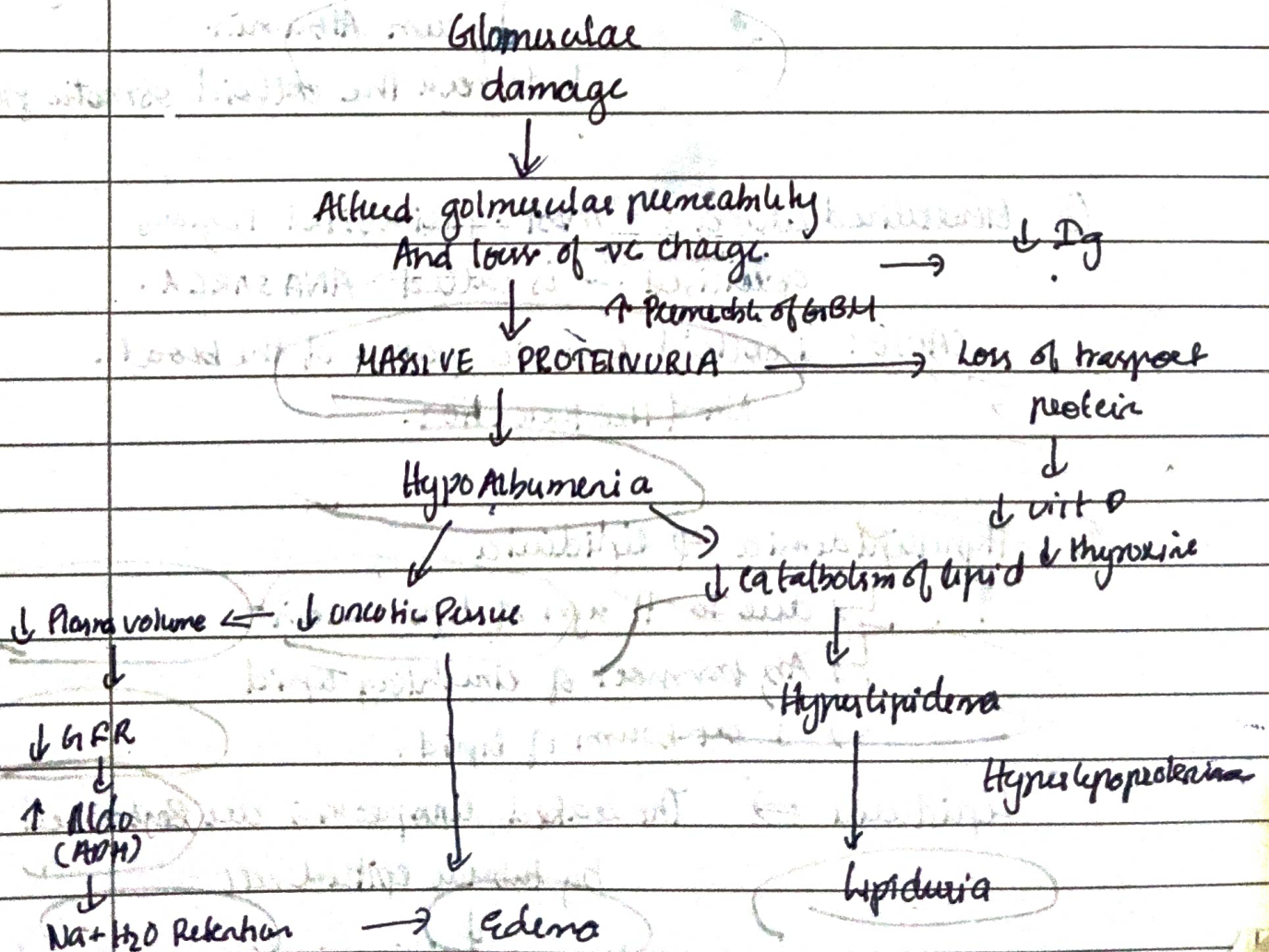


NEPHROTIC SYNDROME.

Definition: It is a clinical disorder caused by a derangement in glomerular capillary walls that leads to $\uparrow$ sed permeability to plasma proteins.

- ② $\Rightarrow$ Massive / heavy proteinuria ($>3.5g$ of protein)
- ① $\Rightarrow$ Hypoalbuminemia in serum.
 - $\rightarrow$ Generalized edema
 - $\Rightarrow$ Hyperlipidemia And lipiduria

PATHOGENESIS:



① MASSIVE PROTEINURIA:

→ due to ↑ permeability of glomerular capillary wall to plasma proteins

Highly selective
Proteinuria

(low molecular weight)
protein

- minimal change disease

Nonselective Proteinuria

(high / large weight
protein)

- membrane nephropathy

② Hypoalbuminemia: Plasma Albumin level less than 3g/dL.

↓ serum Albumin.

↓ decrease the colloid osmotic pressure

③ Generalized edema: most - periorbital Regions
generalized - is called ANASARCA.

CAUSE: ↓ colloid osmotic pressure of the blood.

Na & H₂O Retention.

④ Hyperlipidemia & Lipiduria

↳ due to ↑ synthesis of lipoproteins

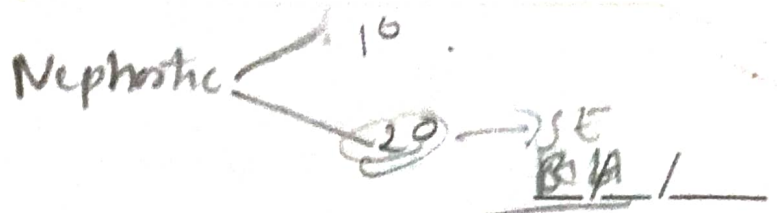
↳ Ab transport of circulating lipid

↳ ↓ catabolism of lipid.

Lipiduria ⇒ The leaked lipoproteins are reabsorbed
by tubular epithelial cells

↓
lipid appears in urine either as free fat or
fat over bodies.

fat
cast



COMPLICATIONS:

- Coronary Atherosclerosis
- Infection → due to loss of Ig in urine
- Thrombotic And thromboembolic complications.

PRIMARY NEPHROTIC SYNDROME:

- ① → minimal-change disease ~ 75% (child)
- ② → membranous glomerulopathy ~ 30% (Adult)
- ③ → focal segmental glomerulosclerosis (FSGS) etc.

MINIMAL CHANGE DISEASE: (Lipoid nephrosis)

- MCD ⇒ • most frequent NS in children
- ⇒ characterized by glomeruli that appear normal appearance by light microscopy. (intention / null deposit)
 - ⇒ ONLY UNDER ELECTRON MICROSCOPY: It shows diffuse effacement (loss) of foot process of visceral epithelial cell (podocytes).

PATHOGENESIS:

due to injury to the visceral epithelial cells.

- MCD may follow a Resp infection
- ↑ chance of MCD in certain HLA
- ↑ MCD in Hodgkin Lymphoma
- 2ndary to use of NSAID.
- Respond to corticosteroid And other immune suppressive therapy.

//_

Mechanism: circulation molecules injure podocytes

↓
proteinuria occurs
2nd to injury to foot process effacement.

MORPHOLOGY:

- kidney mildly enlarged
- cut section show pale to yellow cortex.

LIGHT MICROSCOPY:

Immunofluorescence = -ve

Glomeruli: normal by light microscopy.

Tubules: contain lipid vacuoles and granular protein droplets

↓
hence lipid nephrosis.

ELECTRON MICROSCOPY:

Characteristic feature is effacement of foot process in visceral epithelial cells.

Urinary findings: Proteinuria, oval fat bodies, fatty cast in urine.

C.F → MCD may be preceded by upper
Respiratory tract infection or
immunization.

a seen in Adults. _/_/_

FOCAL SEGMENTAL GLOMERULOSCLEROSIS:

→ (FSGS) → sclerosis of some glomeruli (focal) that involve only a part of each affected glomerulus.

1° FSGS

2° FSGS.

→ 2° FSGS

↳ Maladaptive Response to nephron loss:

↳ type of chronic kidney disease cause loss of functional renal mass & may develop FSGS

↳ Infection: occur with HIV.

↳ Drugs: heroin use, α -Ahn, TRPC6.

↳ Genetic:

PATHOGENESIS:

• Injury to podocytes:

→ This injury produces a fusion of the foot processes and associated with increased glomerular permeability.

• Permeability - Inducing factor produced by lymphocytes:

⇒ deposition of hyaline in the glomeruli is due to entrapment of plasma proteins & lipid in the foci of injury where sclerosis develops.

MORPHOLOGY:

initially involves only the juxtaglomerular glomeruli:

- The lesion occurs in only some tufts within a glomerulus while other tufts appear normal on light microscopy

EM: islethic And Nonsclethic auc show diffuse effacement of foot process of podocytes of epithelial cell

Immunofluorescence Microscopy: show non-specific trapping of Ig usually Ig M complement in the area of hyaline.

MICROSCOPIAL FEATURES:

- (i) Thickened mesangial matrix
- (ii) obliterated capillary lumina.
- (iii) deposition of hyaline of homogeneous and eosinophilic nature.
- (iv) foamy (lipid-laden) macrophages.

Adv stages: sclerosis of the glomeruli involve other glomeruli — Atrophy of tubules fibrosis of the interstitium

⇒ collapsing glomerulopathy: morphologic variant of FSGS characterized by collapse of the glomerular tuft and epithelial cell hyperplasia.

C.F: hematuria And hypertension are more common in poor Respon to corticosteroid therapy.

Urine findings: Proteinuria, oval fat bodies, fatty casts