# NEPHROTIC SYNDROME AND HEAVY PROTEINURIA

MARYAM RAHBAR

NEPHROLOGIST

TUMS

# Introduction

- Disease of glomerulus can result in two different disorder : nephritic and nephrotic
- Nephrotic syndrome: proteinuria and lipiduria , few cell or cast
- Heavy proteinuria(PROTEIN EXCERTION greater than 3.5g/24h) , hypoalbuminemia (less than 3.5 g/dl) and peripheral edema .
- Hyperlipidemia and thrombotic disease are also frequently observed

# Etiology

- Heavy proteinuria with or without the nephrotic syndrome may occur in association with a wide variety of primary and systemic diseases.
- The etiology of nephrotic syndrome varies by race , ethnicity, and gegraphic
- Minimal change disease (MCD) is the predominant cause in childern
- In adult approximately 30% have a systemic disease such as DM , Amyloidosis , or SLE
- The remaining cases are primary kidney disorders such as MCD ,FSGS , MN

# PATHOPHSIOLOGY

- Proteinuria are three type: glomerular , tubular , overflow
- Nephrotic syndrome : glomerular
- increased filtration of macromolecules across the glomerular capillary wall
- Electical potential differences generated by transglomerular flow may modulate the flux of macromolecular across the glomerular capillary wall

- Damage or dysfunction to component of glomerulus including in basement membrane ,the endothelial surface, epithelial cells(podocytes) leads to loss of proteinuria
- Podocyte appears to be the major of injury in diseases that cause idiopathic nephrotic syndrome in adult and child
- Antibodies that target the PLA2r on podocyte are most likely causes of primary membranous nephropathy and is thus considered renal –specific autoimmune disease
- T cell and B cell activation likely play a role in MCD
- FSGS can result from circulation factors and podocyte mutation

# Edema

- Two major factors but lead to retention
- Primary sodium retention that is directly induce by the kidney disease (overfill hypothesis)
- Secondary sodium retention, albumin loss in urine, oncotic pressure decreases ,there by decreasing circulating volume, This volume change is sensed by the juxtaglomerular apparatus and stimulates the RAS leading to sodium and fluid retention(underfill hyothesis)

- Hypoalbuminemia: mechanism is not understood
- Urine excertion and catabolized

# Hyperlipidemia and lipiduria

- The two most common lipid abnormalities: hypercholesterolemia and hypertriglyceridemia
- Low oncotic pressure stimulate hepatic lipoprotein synthesis
- Decreased hepatic lipase activity and decreased lipoprotein activity in the endothelium and peripheral tissue which results in impaired clearance of lipoproteins
- Lipiduria : fatty  cast , oval fat bodies ,maltease cross

# complications

- Protein malnutrition: loss lean body mass
- Hypovolemia
- Acute kidney injury
- Thromboembolism
- Infection
- Fanconi syndrome
- Low synthesis erythropoietin

# Diagnosis

- Assessment  proteinuria: 24h urine collection
- Alternative  to urine collection : protein to creatinine ratio(mg/mg) on urine random

# Serology study

- Urinalysis with  microscopy
- Spot urine protein: creatinine ratio
- CBC(diff)
- Comprehensive  metabolic panel
- HbA1C
- Complement panel
- HIV
- Hepatitis panel
- Antinuclear antibody with titer
- Serum protein electrophoresis and urine
- Serum free light chain
- PLA2R

# Kidney biopsy

- Gold standard procedure for determining the cause of proteinuria

# Treatment

- Specific therapy for primary nephrotic syndrome

- Treatment edema: Diuretic therapy, loop diurtic

# Treatment  proteinuria

ACEIs

ARBs

SGLT2 inhibitors

# Hyperlipidemia

- Optimal treatment of patient with persistent nephrosis in uncertain
- Dietary modification
- Lipid-lowering therapy

# Hypercoaglupathy

- Membranous  nephropathy
- If thrombosis occurs: heparin therapy follow by warfarin for  as long as the patient remains nephrotic