PROTEINUREA.

- *Manifestation of glomerular disease, characterised by nephrotic range proteinurea and a triad of clinical finding associated with large urinary losses of protein : hypoalbuminaemia, edema and hyperlipidemia.*
- *Urine dipstick.*
- *Urinary pr./cr. Ratio.*
- *24 hrs urine collection.*

PROTEINUREA.

- *The presence of abnormal quantities of protein in the urine is called proteinurea.*
- *Evaluation of proteinurea—*
- *HISTORY—*
- *Symptoms of renal failure.*
- *Past history of DM, HTN, CCF.*
- *Drug history---NSAID, Captopril.*
- *Family history of PCKD*.

Examination.

- *Look for sign of Nephrotic syndrome.*
- *Urine dipstick test to check for microscopic hematurea.*
- *If present go for urine microscopy.*
- *Rule out Diabetes and UTI*.

Quantification for proteinurea.

- 24 hrs urine collection.
- Spot urine protein to creatinine ratio.(PCR).
- Albumin to creatinine ratio. (ACR).
- More than 150 mg in 24h(PCR) is abnormal.
- Nephrotic range > 3.5 g/24h or ratio of 3500.
- Check for serum albumin and cholesterol.

URINE DIPSTICK TEST.

- *Positive:*
- *If proteinurea ≥ 1+ (30mg/dl with sp.g <1.015.*
- *.....≥ 2+ (100mg/dl).....> 1.015.*
- *Less sensitive*
- *LMWP*
- *Bence jones protein.*
- *Gamma globulins.*
- *It mainly detects albumin*.

Urine dipstick test.

- Classification of proteinurea–
- Negative----no protein.
- Trace -------10—20 mg/dl.
- 1+ --------30-100 mg/dl.
- 2+ ---------100- 300 mg/dl.
- 3+ --------300- 1000 mg/dl.
- 4+ --------> 1000mg/dl.

Urine dipstick test.

- **FALSE NEGATIVE**
- Diluted urine
- Disease in which predominant urinary protein is not albumin.
- **FALSE POSITIVE**
- Concentrated urine
- Urine PH > 7.
- Gross hematurea.
- Antiseptic contamination.

URINARY PROTEIN/CREATININE RATIO.

- *First morning voided urine should be tested.*
- *This ratio is age dependent:*
- *< 2 years < 0.5*
- *> 2 years < 0.2*
- *Nephrotic range.....≥ 3.*

24 hours urine collection.

- Normal proteinurea
- < 4mg/m2/hours
- Abnormal proteinurea
- > 4mg/m2/hours
- Nephrotic range proteinurea
- > 40 mg/m2/hours

Types of proteinurea.

- Transient proteinurea.
- Postural proteinurea.
- Persistent proteinurea.

- **TRANSIENT PROTEINUREA—**
- High fever, exercise, dehydration, stress, etc.
- Note-
- Does not exceed 2+
- It is benign.
- No need to any evaluation.

POSTURAL PROTEINUREA.

- *Morning voided urine- absent/ traces of protein.*
- *Urine pr./cr. < 0.2 for 3 consecutive days.*
- *Most common cause:*
- *In 60 % of school age and adolescent children.*
- *Usually asymptomatic.*
- *Usually not exceed 1g/m2/day.*
- *No BP INCREASE, azotemia, oedema, hypoalbuminemia*.

Persistent proteinurea.

- Necessary to R/O postural proteinurea.
- Exact cause unknown.
- Possible cause --
- Altered renal hemodynamic
- Partial renal vein obstruction.
- If persists-
- Long term follow up for renal disease detection.

FIXED PROTEINUREA.

- *Significant proteinurea in first morning voided urine for 3 consecutive days.*
- *> 1+ on dipstick.*
- *> 0.2 U pr./U.cr.*
- *It usually indicates renal disease.*
- *Classified on the basis of site of origin:*
- *Glomerulous.*
- *Tubular*

Glomerular proteinurea.

- Due to increased glomerular capillary permeability.

It is always selective.

- Selective proteinurea
- Excretory protein molecular wt. ≤ albumin.
- Non selective proteinurea
- Excretory protein, molecular wt. > albumin.

Glomerular proteinurea

- Suspect if
- U pr./cr. Ratio > 1.0
- Associated with hypertension, Azotemia, oedema, hematurea.

- Causes are
- FSGN,,PSGN,IGA nephropathy, HSPN.

Tubular proteinurea.

- MW< albumin, protein filter---- reabsorb.
- Reabsorption reduces in proximal tubular injury disease.
- Low MW proteins.
- < 1g/d.
- Urinary Pr./cr. < 1.0
- Oedema absent.
- Cause-
- cystinosis, ATN, PCKD.

NEPHROTIC SYNDROME.

- Incidence: 2-3/100,000 children/year.
- 15 times more common in children.
- Characterised by
- Heavy proteinurea > 40mg/m2/ hrs.
- Hypoalbuminemia < 2.5 mg/dl.
- Oedema
- Hypercholestremia/Hyperlipidemia > 200 mg/dl.

Classification of Nephrotic syndrome.

- 1.Ideopathic(90%).
- -Minimal change 85%.
- Mesengial proliferative 5%.
- FSGN 10%.
- 2.Secondary (10%).
- Membranous nephropathy
- Membranoproliferative glomerulonephritis.
- 3.Congenital.

PATHOLOGY.

Due to inflammation of glomerular capillaries. → *Abnormal permeability of GBM.* → *Then protein(Albumin) is filterate in urine(proteinurea)* → *Decrease serum albumin level.*

PATHOLOGY.

Due to albumin decreases in blood

Oncotic pressure in blood	Also decreases.

So, fluid comes out to extracellular space.

edema	Orbital edema

then

Generalised edema	ANASARCA.

Sign/symptoms of Idiopathic NS.

- Periorbital oedema.
- Pedal oedema.
- Ascites and pleural effusion.
- General oedema.
- Hematurea in few cases.

MCNS(LIPOID NEPHROSIS)

- *Commenest cause of nephrotic syndrome(70%).*
- *Common in male M:F 2:1*
- *Common age 2-7 years.*
- *15 Times more common in children.*
- *Oedema , anorexia, irritability, abdominal pain, diarrhoea.*

Diagnosis of MCNS.

- Urine analysis : Protein urea 3-4+(selective).
- Microscopic hematurea 10-20 %.
- Spot urine-urinary pr./cr. ≥ 2.
- 24 hrs urine collection > 40 mg/m2/h proteinurea .
- S.albumin < 2.5 mg/dl.
- High cholestero and triglycerides > 200 mg/dl.
- S. Urea, creatinine, C3, C4, levels normal
- Renal biopsy E/M fusion of epithelial cells foot process.