Pediatric nephrology lectures

Assistant professor
Dr. Nariman Fahmi Ahmed Azat
Lectures

- Post infectious GN
- Hypertension in children
- Nephrotic syndrome
- Acute renal failure
- Hemolytic uremic syndrome
- Urinary tract infection
POST INFECTIOUS GLOMERULONEPHRITIS (PIGN)

Dr. Nariman Fahmi Ahmed Azat
Objectives

Introduction (renal function)

- Definition (PIGN)
- Pathogenesis
- Clinical Features
- Management
- Case Scenarios Discussion
Introduction

The main functions of the kidneys are

- Controlling the balance of fluid and electrolytes
- Controlling acid base balance
- Filtering blood and passing the waste products to bladder as urine
- Controlling blood pressure
Each kidney contains one million **nephrons**. Nephrons (small structures that do the work)

The unfiltered blood pass into the Nephron by a small blood vessels (Afferent arteriole)
Introduction

- then the **glomerulus**
- which is a tiny ball-shaped structure composed of blood vessels
- actively involved in the filtration of the blood to form urine.
- The **tubules** carries away filtered waste materials in the urine,
- and a small blood vessel returns filtered blood to the body (efferent arteriole)
Any disease of the kidney filters considered serious because it interferes with the basic functions of the kidneys.
*One of the oldest recognized renal diseases.

Before named as: Acute poststreptococcal glomerulonephritis (APSGN)

Currently: Post Infectious glomerulonephritis (PIGN)
Pathogeneic agents mainly group A streptococcus (Nephritogenic strains M types 1, 2, 4, 12, 18, 25, 49, 55, 57, 60)

Pathogeneic agent could also includes staph, gram negative bacteria, others
Pathogenesis

- glomerular-immune complex formation
- immune complexes formed from antigen, antibodies, and complement, get trapped in kidney filters (Glomeruli).
- The filters become inflamed, which leads to ineffective kidney function.
- there are some genetic factors that put people at risk for this.
antibodies find the target and complement destroys it.
Post-Infectious GN

- The Infection does not occur in the kidneys, but in a different part of the body, such as the skin or throat.
- This disorder may begin to develop one to two weeks after an untreated throat infection.

- three to four weeks after an untreated skin infection.

- mostly common in children ages six to ten.
Clinical presentation:

- 3 phase sequence: infection - interval - nephritic syndrome
- The severity of renal involvement varies from asymptomatic microscopic hematuria with normal renal function to acute renal failure.
Richard Bright 1927 Acute Glomerulonephritis

Abrupt onset

- Hematuria (coca couloured)
- Oliguria (Reduced GFR)
- Oedema
  (Salt and water retension)
- Hypertension
Periorbital swelling
DIAGNOSIS

- **Urinalysis** demonstrates
- red blood cells (RBC)
- frequently in association with RBC casts
- mild proteinuria,
- polymorphonuclear leukocytes (Granular cast).
A mild normochromic anemia may be present from hemodilution and low-grade hemolysis.

The serum C3 level is usually reduced in the acute phase and returns to normal 6–8 wk after onset.

Positive throat culture report may support the diagnosis.

The antistreptolysin O titer is commonly elevated after a pharyngeal infection.

Anti-deoxyribonuclease (DNase) B level after cutaneous infection.
Treatment

Conservative management

- BP control (hypertension)
- Diuresis (oliguria, Oedema)
- Treatment of infection (throat or Skin)
Treatment

Treatment is focused on relieving symptoms

- Restriction of salt and fluid
- Antibiotics (ex. Penicillin), for streptococcal bacteria.
- Blood pressure medications
- Diuretic medications may be needed to control swelling and high blood pressure.
Dialysis ??
prognosis

- Usually mild disease
- recovery typically within weeks (95%)
  - 1 week: onset of diuresis
  - 4 weeks: normalization of renal function
- 3-6 months: resolution of hematuria
Possible Complications

- Congestive heart failure
- Pulmonary edema
- Hyperkalemia
- High blood pressure (hypertension)
- Acute renal failure
- Chronic glomerulonephritis
Acute Glomerulo Nephritis Case Scenarios

- 5 yr Girl Sudden onset Facial puffiness Oliguria & Cola colored urine Generalized oedema
- Headache
- Preceding infected skin lesion following trauma
- No other specific features
- Physical Examination –
- Generalized Oedema,
- Hypertension
On Evaluation:

- Urine coke colored
- 1-2 + proteinuria
- Red blood cells,
- red cell and granular casts
- normal B. Urea 68-102-145mgm/dl
- Creatinine 0.8—1.6—3-4 mgm/dl
- S.Sodium / Potassium 128/5.8—132/6.4 meq/L
- ASO Positive
- Serum Complement C3 – 0.3 mgm/dl (0.9- 1.2 mgm/dl)
How do you manage this patient??

What is the possible complications in this case??
Thank you