Acute Glomerulonephritis
Objectives

At the end of this discussion, YOU will be able to:

• Define acute glomerulonephritis

• Explain the pathophysiology of acute glomerulonephritis

• Identify the clinical manifestations of acute glomerulonephritis

• Discuss the therapeutic management of acute glomerulonephritis

• Discuss nursing management for a child with acute glomerulonephritis
POSTSTREPTOCOCCAL GLOMERULONEPHRITIS
https://www.youtube.com/watch?v=SiaHP1Kw8ME

https://www.youtube.com/watch?v=mDjPhHSE-5I
Acute Glomerulonephritis (AGN)

- A glomerular injury that is accompanied by inflammation of the glomeruli.
- It is a clinical constellation of sudden onset of hematuria and proteinuria, edema, and hypertension with or without RBC casts.
Acute Glomerulonephritis (AGN)

• A manifestation of a systemic disorder that can range from minimal to severe

• Most cases are post infectious and have been associated with pneumococcal, streptococcal, and viral infection

• **Common features include:**
  
  • oliguria
  
  • edema
  
  • hypertension and circulatory congestion, hematuria, and proteinuria
Acute Post Streptococcal Glomerulonephritis (APSGN)

- Is the most common of post infectious renal diseases in childhood
- Can occur at any age but affects primarily early school-age children, with a peak age of onset of 3 to 12-year-old
- It is uncommon in children younger than 3 years of age
- More common in winter or spring
Etiology of APSGN

• Is an immune-complex disease that occurs after an antecedent streptococcal infection with certain strains of the group A β-hemolytic streptococcus.

• Disease secondary to streptococcal pharyngitis
Pathophysiology

- The pathophysiology of APSGN is still uncertain.

- One explanation is that the streptococcal infection is followed by the release of a membrane-like material from the specific organism into the circulation.

- Because it is antigenic, antibodies are formed and immune complex reaction occurs after a period.
Pathophysiology

• The immune complexes become trapped in the are deposited in the glomerular capillary loop.

• T glomerular capillary loops are destroyed by swelling and infiltration with polymorphonuclear leukocytes add to the appearance of increased cellularity
Consequently, the glomeruli appear dense and lobulated. Endothelial cell proliferation and edema occlude the capillary lumen of the affected glomeruli.
Pathophysiology

• Kidney appear normal or moderately enlarges

• The resulting decrease in plasma filtration results in an excessive accumulation of water and retention of sodium that expands plasma and interstitial fluid volumes, leading to circulatory congestion and edema
Pathogenesis of glomerulonephritis

Glomerulonephritis Pathology

1. Inflammation
   - Injury to glomerulus
   - Inflamed glomerular capillaries
     - mild proteinuria
     - mild hematuria

2. Accumulation of cells cause blockage
   - Decreased GFR
     - Increased blood pressure
     - Oliguria
     - Edema
     - Mild azotemia
Clinical Manifestations

GLOMERULONEPHRITIS

Antigen-Antibody Complex in Glomeruli Causing:
- Inflammation
- Glomerular Filtration Rate

Antigen-Antibody Complex From Recent Strep Infection

- Headache
- ↑ BP
- Facial / Periorbital Edema
- Lethargic
- Low Grade Fever
- Weight Gain (Edema)

Proteinuria
Hematuria
Oliguria
Dysuria

Clinical Manifestations

- The affected children are in good health until they experience the antecedent infection.
- The initial signs included puffiness of the face.
- Especially periorbital
Clinical Manifestations

• Facial edema more prominent in the morning. Spreads during the day to involve extremities and abdomen.

Characteristics of acute nephritic syndrome:

- Haematuria
- Oliguria
- Oedema
- Hypertension
- Reduced glomerular filtration rate (GFR)
- Proteinuria
- Fluid overload

https://www.slideshare.net/E_neutron/glomerulonephritis-in-children

12/13/2020
Clinical Manifestations

• Urine:
  • Cloudy, smoky brown (resembles tea or cola)
  • Severely reduced volume
Clinical Manifestations

Older children may complain of:

- Headaches
- Abdominal discomfort
- Dysuria
- Mild to moderately elevated blood pressure
- May have severe symptoms such as seizures from hypertensive encephalopathy
- Pulmonary and circulatory congestion
- Hematuria
NURSING ALERT!

- A child who exhibits the following should be evaluated for possible AGN:
  - Orbital edema, which parents report is worse in the morning
  - Loss of appetite
  - Decreased output
  - Dark-colored urine
  - Antecedent streptococcal infection
Clinical Course

• The acute edematous phase of AGN usually persist from 4-10 days but may persist 2-3 weeks, During this phase the child remains:
  • Listless
  • Anorexic
  • Apathetic
  • Weight fluctuates
  • The urine remains smoky brown
  • BP may suddenly reach dangerously high level
Clinical Course

• The first sign of improvement is an increase in urinary output with decrease in body weight as the edema resolves

With diuresis:

• The child begins to feel better
• The appetite improves
• The blood pressure decreases to normal
• Gross hematuria diminished
Diagnostic Evaluation

• Urine analysis shows:
  • Hematuria, proteinuria, and increase specific gravity

• Gross discoloration of the urine reflects red blood cell and hemoglobin content

• Cultures of the pharynx are rarely positive for streptococci, because the renal disease occurs weeks after the infection.
Diagnostic Evaluation

- Microscopic examination of the sediment shows:
  - many red blood cells
  - Leukocytes
  - epithelial cells
  - granular and red blood cell casts
- Bacteria are not seen.
Diagnostic Evaluation

• Azotemia that results from impaired glomerular filtration is reflected in elevated blood urea nitrogen and creatinine levels in at least 50% of cases.

• Occasionally proteinuria is excessive and the child may have nephrotic syndrome (i.e., hypoproteinemia and hyperlipidemia).
Therapeutic Management

• No specific treatment

• Recovery is spontaneous in most cases

• Management consists of general supportive measures and early recognition and treatment of complications.
Therapeutic Management

• Children who have normal blood pressure and a satisfactory urine output can generally be treated at home but must be closely monitored.

• Those with substantial edema, hypertension, gross hematuria, or significant oliguria should be hospitalized because of the unpredictability of complications.
Therapeutic Management

General measures:

• Bed rest is not necessary because ambulation does not affect the course of disease

• Children may voluntarily restrict their activities because of fatigue and malaise
Therapeutic Management

• Regular measurement of vital signs, body weight, and intake and output is essential to monitor the progress of the disease and to detect complications that may appear at any time during the course of the disease.

• A record of daily weight is the most useful means for assessing fluid balance.
Therapeutic Management

- Fluid balance

- Regular measurement of vital signs, body weight, and intake and output is essential to monitor the progress of the disease and to detect complications that may appear at any time during the course of the disease.

- A record of daily weight is the most useful means for assessing fluid balance.
Therapeutic Management

• Diuretic Therapy (Lasix) is helpful if significant edema and fluid overload are present

Hypertension:

• Blood pressure measurements are taken every 4 to 6 hours.

• Seizures associated hypertensive encephalopathy require anticonvulsant therapy
Nutrition:

• Dietary **restrictions** depend on:
  
  • The stage and severity of the disease
  
  • The extent of edema
Therapeutic Management

Nutrition:

- Moderate sodium **restriction** and even fluid restriction may be instituted for children with hypertension and edema.

- Foods with substantial amounts of potassium are generally **restricted** during the period of oliguria.
Therapeutic Management

Nutrition:

Acute Glomerulonephritis Nutrition

- Potassium restriction
  - during periods of oliguria
- Protein restriction
  - if severe azotemia
- Regular diet
  - in uncomplicated cases

Foods High in Potassium

Avocado, Banana, Potatoes, Spinach, Beans, Citrus juices, Fish

https://slideplayer.com/slide/11982606/
Nursing Management

• It involves careful assessment of the disease status

• Regular monitoring of vital signs (including frequent measurement of blood pressure), fluid balance, and behavior.

• Vital signs provide clues to the severity of the disease and early signs of complications.
Nursing Management

• The volume and character of urine are noted, and the child is weighed daily.

• Children with restricted fluid intake, especially those who are not severely edematous or those who have lost weight, are observed for signs of dehydration.
Nursing Management

• For most children a regular diet is allowed, but it should contain no added salt.

• Foods high in sodium and salted treats are eliminated, and parents and friends are advised not to bring snacks such as potato chips.

http://healthliving.in/glomerulonephritis-diet/
Nursing Management

• Assessment of the child's appearance:
  • for signs of cerebral complications is an important nursing function, because the severity of the acute phase is variable and unpredictable

• Fluid restriction, if prescribed, is more difficult, and the amount permitted should be evenly divided throughout the waking hours.
Nursing Management

- The child with edema, hypertension, and gross hematuria may be subject to complications, and anticipatory preparations such as seizure precautions and intravenous equipment are included in the nursing care plan.

- During the acute phase children are generally quite content to lie in bed.
Nursing Management

• Children who have mild edema and no hypertension, as well as convalescent children who are being treated at home, need follow-up care.

• Parents are instructed regarding general measures, including diet, and prevention of infection.

• Activities should be planned to allow for frequent rest periods and avoidance of fatigue.
Nursing Management

• Health supervision is continued with weekly, followed by monthly, visits for evaluation and urinalysis.

• Parent education and support in preparation for discharge and home care include education in home management and the need for follow-up care and health supervision.
Prognosis

Almost all children correctly diagnosed as having APSGN recover completely, and specific immunity is conferred, so that subsequent recurrences are uncommon.

- Some of these children have been reported to develop chronic disease
- Death from complications is rare
Complications

• Hypertension encephalopathy

• Acute kidney injury
Thank You