ACUTE GLOMERULONEPHRITIS

Acute glomerulonephritis refers to a group of kidney diseases in which there is an inflammatory reaction in the glomeruli. It is not an infection of the kidney, but rather the result of the immune mechanisms of the body.

Pathophysiology and Etiology

- ★ Occurs after infection elsewhere in the body or develop secondary to systemic disorders.
- ★ An antigen-antibody reaction produces immune complexes that lodge in the glomeruli, producing thickening of glomerular basement membrane; renal vasculature, interstitium, and tubular epithelium may also be affected.
- ★ Immune complexes activate a variety of secondary mediators, as complement pathways, neutrophils, macrophages, prostaglandins, and leukotrienes. These affect vascular tone and permeability, resulting in tissue injury.
- ★ Eventual scarring and loss of filtering surface may lead to renal failure.

Clinical Manifestations

- ✪ Mild disease is frequently discovered accidentally through a routine urinalysis.
- ✪ History of infection: pharyngitis from group A streptococcus, such viral infections as hepatitis B
- ✪ Tea-colored urine, oliguria
- ✪ Puffiness of face, edema of extremities
- ✪ Fatigue and anorexia, possible headache
- ✪ Hypertension (mild, moderate, or severe), headache
- ✪ Anemia from loss of RBCs into the urine
- ✪ Clinical course of acute glomerulonephritis proceeds as follows from onset of symptoms to recovery—more than 90% of patients regain normal renal function within 60 days:
  - ☆ Diuresis usually starts 1 to 2 weeks after onset of symptoms.
  - ☆ Renal clearances and blood urea concentration return to normal.
  - ☆ Edema decreases, and hypertension lessens.
  - ☆ Microscopic proteinuria or hematuria may persist for many months.

Diagnostic Evaluation

- ★ Urinalysis for hematuria (microscopic or gross), proteinuria, cellular elements, & casts.
- ★ 24-hour urine for protein (🡅) & creatinine clearance (🡇) outline degree of renal function.
- ★ Elevated BUN and serum creatinine levels, low albumin level, increased antistreptolysin titer (from reaction to streptococcal organism), and decreased serum complement.
- ★ Needle biopsy of kidney reveals obstruction of glomerular capillaries.

Management

- ✪ Symptomatic Management includes: antihypertensives, diuretics, drugs for hyperkalemia, H_2 blockers (prevent stress ulcers), & phosphate-binding agents (to reduce phosphate and elevate calcium).
- ✪ Antibiotic therapy is initiated to eliminate infection (if still present).
- ✪ Fluid intake is restricted.
- ✪ Dietary protein is restricted moderately if there is oliguria and the BUN is elevated. It is restricted more drastically if acute renal failure develops.
- ✪ Carbohydrates are increased liberally to provide energy and reduce catabolism of protein.
- ✪ Restrict potassium & sodium intake in (hyperkalemia, edema, or signs of heart failure).

Complications

☠ Fluid & electrolyte imbalances in acute phase, hyperkalemia, hyperphosphatemia, hypervolemia	
☠ Hypertension, heart failure, endocarditis	☠ Malnutrition
☠ Hypertensive encephalopathy, seizures	☠ End stage renal disease (ESRD)

Nursing Assessment

- ★ Obtain medical history; focus on recent infections or symptoms of chronic immunologic disorders (systemic lupus erythematosus, scleroderma).
- ★ Assess urine specimen for blood, protein, color, and amount.
- ★ Perform physical examination specifically looking for signs of edema, hypertension, and hypervolemia (engorged neck veins, elevated jugular venous pressure, adventitious lung sounds, cardiac arrhythmia).
- ★ Evaluate cardiac status and serum laboratory values for electrolyte imbalance.

Nursing Diagnoses

- ☏ Ineffective (Renal) Tissue Perfusion related to damage to glomerular function
- ☏ Excess Fluid Volume related to compromised renal function

Nursing Interventions

Promoting Renal Function

- ★ Monitor vital signs, intake & output, and maintain dietary restrictions during acute phase.
- ★ Encourage rest during the acute phase, as directed, until the urine clears and BUN, creatinine, and BP normalize. (Rest also facilitates diuresis.)

★ Administer medications, as ordered, and evaluate patient's response to antihypertensives, diuretics, H_2 blockers, phosphate-binding agents, and antibiotics (if indicated).

Improving Fluid Balance

☆ Carefully monitor fluid balance; replace fluids according to patient's fluid losses (urine, respiration, feces) and daily body weight as prescribed.
☆ Monitor pulmonary artery pressure and CVP, if indicated, during acute hospitalizations.
☆ Monitor for signs and symptoms of heart failure: distended neck veins, tachycardia, gallop rhythm, enlarged and tender liver, crackles at bases of lungs.
☆ Observe for hypertensive encephalopathy & any evidence of seizure activity.

NURSING ALERT: Hypertensive encephalopathy is a medical emergency, and treatment is aimed at reducing BP without impairing renal function.

Patient Education and Health Maintenance

🕮 Explain that patient must have follow-up evaluations of BP, urinary protein, and BUN concentrations to determine if there is exacerbation of disease activity.
🕮 Encourage patient to treat any infection promptly.
🕮 Tell patient to report any signs of decreasing renal function and to obtain treatment immediately.

Evaluation: Expected Outcomes

✪ Urine output adequate; vital signs stable
✪ No edema, shortness of breath, or adventitious heart or lung sounds