NEPHROSCLEROSIS

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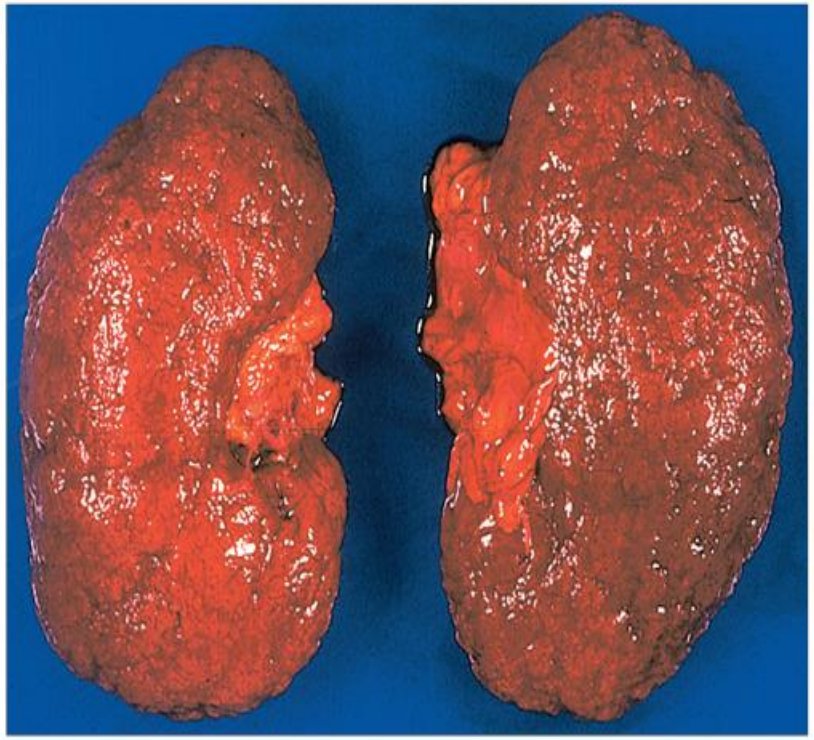
DEFINITION

Nephrosclerosis is the hardening of the walls of the small arteries and arterioles of the kidney. This condition is most often due to prolonged hypertension & diabetes, both of which can cause decreased blood flow to the kidney & patchy necrosis of the renal parenchyma & glomeruli.

Nephrosclerosis is the major cause of ESRD secondary to many disorders.



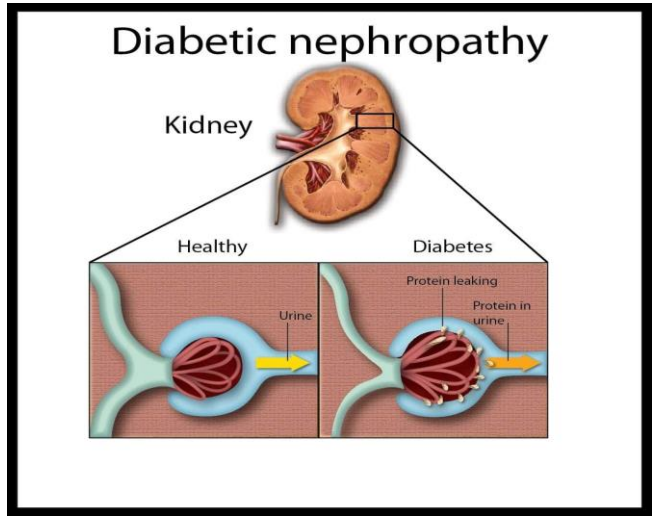
TYPES OF NEPHROSCLEROSIS

1) Benign nephrosclerosis: Benign nephrosclerosis is a gradual and prolonged deterioration of the renal arteries. Usually found in older adults and is often associated with atherosclerosis & hypertension.

2) Malignant Nephrosclerosis: Malignant Nephrosclerosis is often associated with malignant hypertension (diastolic pressure higher than 130 mm Hg). It usually occurs in young adults. The disease process progresses rapidly.

CAUSES/RISK FACTORS

- Chronic Hypertension
- Chronic Kidney diseases
- Diabetic Nephropathy
- Older age
- Afro-Caribbean people



PATHOPHYSIOLOGY

Two pathophysiologic mechanisms have been proposed for the development of hypertensive nephrosclerosis.

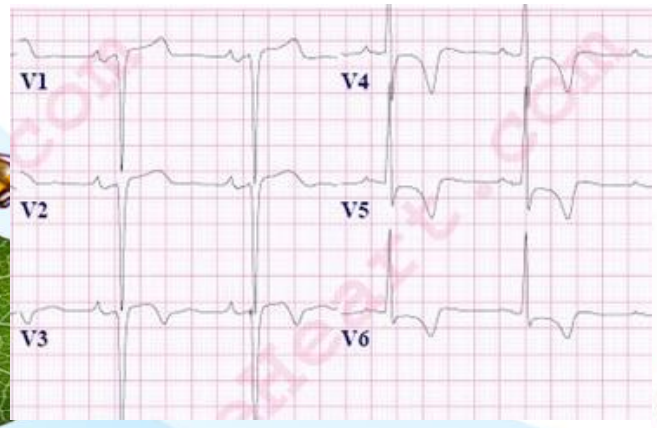
1) Glomerular Ischemia: Chronic hypertension results in narrowing of glomerular arteries and arterioles, with a consequent reduction in glomerular blood flow.
2) Glomerular hypertension and Glomerular hyperfiltration: Initial hypertension leads to glomerular endothelial damage and sclerosis, subsequently in an attempt to compensate for the loss of renal function, the remaining nephrons undergo vasodilation of the glomerular arterioles and experience an increase in renal blood flow and glomerular filtration. The result is glomerular hypertension, glomerular hyperfiltration, and progressive glomerular sclerosis.

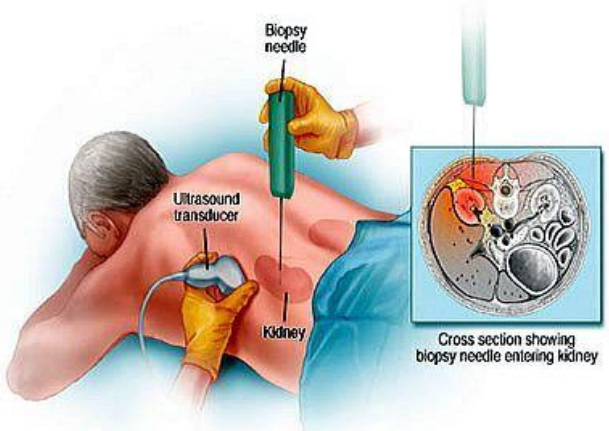
CLINICAL MANIFESTATIONS

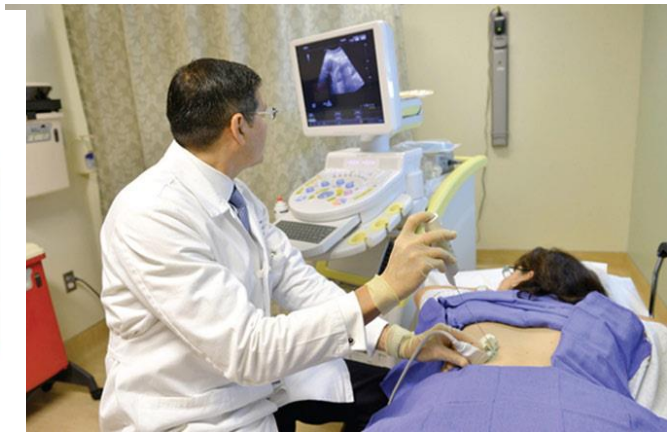
- Hypertension
- Nausea
- Vomiting
- Fatigue
- Anorexia
- Weight loss
- Muscle cramps
- Pruritus
- Mental status changes
- Visual disturbances
- Increased thirst

DIAGNOSTIC EVALUATION

- **BLOOD TESTS**
  - CBC, BUN, Cr, Electrolytes, Glucose
- **URINE ANALYSIS**
  - Microalbuminuria (0.5 to 1g / 24hr)
- **ULTRASOUND OF KIDNEYS**
  - kidney size is usually symmetric and may be normal or modestly reduced.
- **ECG**
  - Left Ventricular Hypertrophy
- **RENAL BIOPSY**
  - Diagnostic, hypertrophy of the interlobular arteries, hyaline degeneration, and sclerosis of afferent arterioles are the most characteristic findings of hypertensive nephrosclerosis.



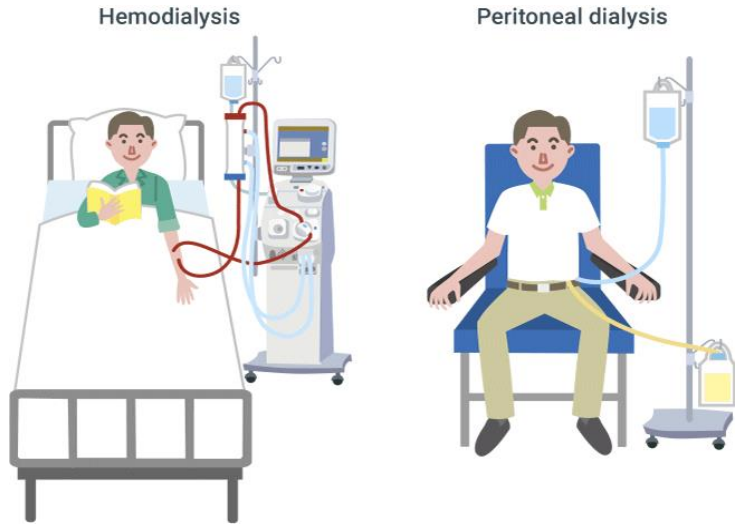




MEDICAL MANAGEMENT

Blood Pressure Control

- Ideal BP of <130/80 mmHg for patients with hypertensive nephropathy
- Several antihypertensive medications, including thiazide diuretics, beta-blockers, ACE inhibitors, ARBs, and calcium channel blockers, can be used as initial in patients with hypertension.
- PD or Hemodialysis
- Fluid restriction
- Iron supplements for anemia



NURSING DIAGNOSIS

- *Risk for decreased cardiac output related to fluid imbalances, myocardial workload, or systemic vascular resistance (SVR), alterations in cardiac conduction or accumulation of toxins (urea), as evidenced by the changes in ECG.*
- *Disturbed thought process related to physiological changes due to accumulation of toxins (e.g., urea, ammonia), metabolic acidosis, hypoxia, electrolyte imbalances or calcifications in the brain as evidenced by disorientation to person, place, time altered attention span, decreased ability to grasp ideas impaired ability to make decisions, irritability, withdrawal, depression, or psychosis.*
- *Risk for impaired skin integrity related to edema or dehydration, reduced activity or immobility or accumulation of toxins in the skin as evidenced by itching.*

NURSING DIAGNOSIS

- *Deficient knowledge related to information misinterpretation or cognitive limitation as evidenced by questions/request for information, statement of misconception, inaccurate follow-through of instructions or development of preventable complications.*
- *Excess fluid volume related to decreased glomerular filtration rate and sodium retention as evidenced by edema, hypertension, weight gain, shortness of breath, oliguria, distended jugular vein or changes in mental status.*
- *Acute pain in flank area related to kidney trauma as evidenced by facial grimaces, limited ROM, body weakness, sleep disturbance, diaphoresis or RR & BP changes.*

NURSING DIAGNOSIS

- *Impaired urinary elimination r/t decreased glomerular filtration as evidenced by impaired excretion of nitrogenous products, increase in lab results (BUN, creatinine, uric acid level), oliguria, anuria, hesitancy or urinary retention.*
- *Altered nutrition, less than body requirement r/t anorexia and malnutrition as evidenced by anemia, fatigue or inadequate food intake less than recommended daily allowance.*
- *Activity intolerance related to generalized weakness as evidenced by fatigue on exertion or lack of energy.*

NURSING DIAGNOSIS

- *Disturbed body image related to psychosocial factors as evidenced by verbal and nonverbal responses to change in body appearance, disruptions in socialization or negative feelings about own body.*
- *Altered renal perfusion r/t glomerular malfunction as evidenced by increase in lab results (BUN, creatinine, uric acid level), oliguria, anuria, edema, pulmonary congestion, hypertension or hematuria.*
- *Risk for infection related to pulmonary edema, metabolic acidosis, uremia, loss of appetite as evidenced by increased body temperature, increased WBC count or the results of urine & blood culture.*

Thank you