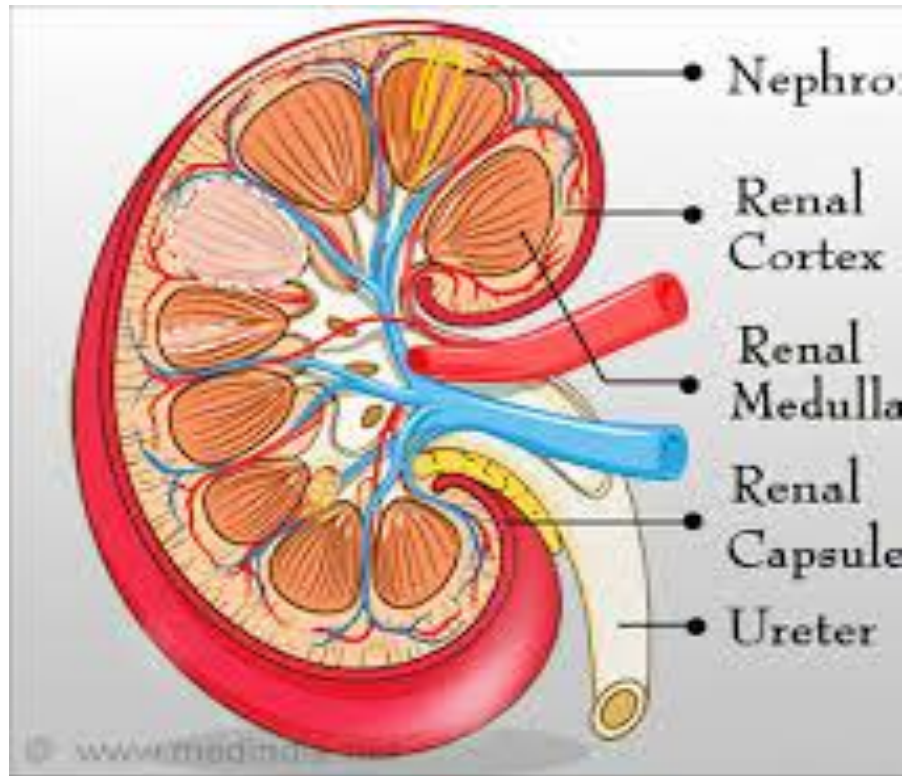


Renal failure



Alaa Hamza

Renal failure

- Renal failure is defined as a significant loss of renal function in both kidneys to the point where less than 10 to 20% of normal GFR remains.
- Renal failure may occur as an acute and rapidly progressing process or may present as a chronic form in which there is a progressive loss of renal function over a number of years.
- Acute renal failure has an abrupt onset and is potentially reversible.
- Chronic failure progresses slowly over at least three months and can lead to permanent renal failure.

Pathophysiology of Renal Failure

- In renal failure there is either glomerular or tubular dysfunction e.g.
- glomerulonephritis primarily causes of glomerular damage
- aminoglycoside nephrotoxicity is mainly in tubular
- Glomerular dysfunction- As the main function of glomeruli is filtration, glomerular dysfunction leads to fall in GFR with retention of those substances usually cleared by filtration, including water.
- Tubular Dysfunction- As the main function of tubules is reabsorption tubular failure results in the voiding of large volumes of dilute urine (polyuria) of low specific gravity, along with electrolytes and nutrients. Acute renal failure
- Sudden decrease in renal function.
- Acute renal failure may be prerenal, intra-renal or post-renal in nature. Acute renal failure is often reversible so long as permanent injury to the kidney has not occurred.

Causes of Acute Renal Failure

- Myocardial infarction, rhabdomyolysis, decreased blood flow, obstruction, hemolytic uremic syndrome, Glomerulonephritis are common causes of acute renal failure.
- Acute Renal Failure classified as pre-renal failure, intra-renal failure and post-renal failure
- Prerenal failure – Results from impaired or reduced blood flow to the kidney – Possible causes: shock, hypotension, anaphylaxis, ischemic formation Causes of Acute Renal Failure
- Intra-renal failure – Results from acute damage to renal structures – Possible causes:
 - acute glomerulonephritis, pyelonephritis
 - May also result from acute tubular necrosis (ATN)
 - damage of kidney structure from exposure to toxins, solvents, drugs and heavy metals; ATN is the most common cause of acute renal failure
- Post-renal failure – Results from conditions block of urine outflow – Possible causes: obstruction of urine outflow by calculi, tumors, prostatic hypertrophy

Symptoms of acute renal Failure

- Oliguria
- Possible edema and fluid retention
- Elevated blood urea nitrogen levels (BUN) and serum creatinine
- Obstruction in the urinary tract
- Blood in urine
- Dehydration Detectable a
- bnormal mass Pale skin
- Poor appetite

Diagnosis of acute renal Failure

- Routine laboratory test (creatinine and blood urea nitrogen)
- Ultrasound of the kidney helps to determine whether kidney problem is acute or chronic.
- kidney biopsy
- computed tomography scan

Treatment

- Prevention of acute renal failure through support of blood pressure and blood volume
- Correction of fluid and electrolyte imbalances
- Dialysis, which may be employed while the kidneys are in the recovery phase
- Low protein, high carbohydrate diet to minimize the formation of nitrogenous waste

Chronic renal failure

Chronic renal failure is the end result of progressive kidney damage and loss of function. Chronic renal failure is often classified into four progressive stages based on the loss of GFR.

- Stages of Chronic Renal Failure Diminished renal reserve ---GFR decreased to 35 to 50% of normal
- Renal insufficiency ----GFR decreased to 20 to 35% of normal
- Renal failure GFR reduced to less than 20% of normal
- End-Stage Renal Disease — GFR is less than 5% of norm

Causes of chronic renal failure

- Chronic glomerulonephritis
- Chronic infections
- Renal obstruction (prolonged)
- Exposure to toxic chemicals, toxins or drugs (aminoglycoside antibiotics and nephrotoxicity)
- Diabetes
- Hypertension
- Nephrosclerosis (atherosclerosis of the renal artery)
- Diabetic nephropathy
- Alport syndrome (inherited disorder causes deafness, progressive kidney damage and eye defects)
- Polycystic kidney disease
- Interstitial nephritis or pyelonephriti

Symptoms of chronic renal failure

- kidney function remains, chronic renal failure may not developed
- Anemia, increased levels of phosphates (in blood) are complications of kidney failure
- Malaise
- Dry skin
- Poor appetite
- Vomiting
- Bone pain
- metallic taste in mouth
- detectable abdominal mass

Treatment of chronic renal failure

- Careful management of fluids and electrolytes
- Prudent use of diuretics
- Careful dietary management; restriction of dietary protein intake
- Recombinant erythropoietin to treat anemia
- Renal dialysis
- Renal transplantation

Type of Dialysis

- Hemodialysis (primary)
- Peritoneal dialysis (primary)
- Others (Hemofiltration)