Acute Renal failure

DEFINITION

Acute Renal failure is the condition in which the kidneys are functioning at less than 15% of it's normal. ARF is a Reversible decrease in Glomerular filtration rate. A condition in which the kidneys suddenly can't filter waste from the blood. Also called as Acute kidney failure. ARF develops suddenly within few days.

EPIDEMIOLOGY

About 25-30% of patients with Acute kidney injury are affected with Acute kidney failure.

ETIOLOGY

Pre-Renal

Due to sudden severe decrease in Blood pressure.
Flow obstruction to the kidneys.
Atherosclerosis
Ischaemia

Intra Renal

Direct damage to the kidneys
Inflammation
Infection
Use of drugs
Lupus erythymatosis

Post Renal

Obstruction of urine flow
Benign prostatic hyperplasia
Kidney stones
Bladder injury
Bladder tumor

PATHOGENESIS

Acute glomerulonephritis is defined as inflammation and subsequent damage of the glomeruli leading to hematuria, proteinuria, and azotemia;
it may be caused by primary renal disease or systemic conditions.

Acute tubular necrosis

Acute tubular necrosis is kidney injury caused by damage to the kidney tubule cells (kidney cells that reabsorb fluid and minerals from urine as it forms).

Acute interstitial nephritis

Acute interstitial nephritis (AIN) is a renal lesion that typically causes a decline in renal function and is characterized by an inflammatory infiltrate in the kidney interstitium.

It is most often induced by drug therapy.

Vascular changes

Endothelial dysfunction in afferent arteriole.

Vasoconstrictive.

Adhesion of inflammatory cells.

Tubular changes

Cell loss

Damaged cell

Necrosis

Forms necrosis cell debris

Obstruction of blood flow due to cell debris

CHARACTERS OF ARF

Structurally

Cell death (Necrosis)

Loss of adhesion to renal cells

Functionally

Decreased GRF

Decreased urine output

Increased nitrogenous waste such as urea, creatinine in blood.

COMPLICATIONS

- Metabolic acidosis
- High Potassium levels
- Uremia
- Changes in fluid balance

DIAGNOSIS

- Increase in serum creatinine by; > 0.3mg/dl within 48 hrs.
- Increase in serum creatinine to; > 1.5 times baseline within 7 days.
- Urine volume: < 0.5ml/kg/hr for 6 hrs.
- 75% of GFR is decreased which leads to three fold increase of creatinine.

MANAGEMENT

- Management includes correction of fluid and electrolyte levels.
- Avoidance of nephrotoxins.
- Kidney replacement therapy.
- Use of acetylcysteine for the prevention of acute renal failure in patients.