Tikrit university

College of Nursing

Clinical Nursing Science

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Critical Care Nursing

(Acute Kidney Injury)

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Acute kidney injury

Definition

Sudden and almost complete loss of kidney functions. Acute kidney injury (AKI) is a relatively new term used to describe the spectrum of acute-onset kidney disorders that can range from mild impairment of kidney function through acute kidney failure that requires renal replacement therapy.

Pathophysiology

There are many causes of AKI and it is frequently multifactorial. It is helpful to classify it into three subtypes:

• 'pre-renal' , when perfusion to the kidneyis reduced

• 'renal', when the primary insult affects the kidney itself

• 'post-renal', when there is obstruction to urine flow at any point from the tubule to the urethra

Causes:

1. Pre-renal causes

Hypovolaemia: haemorrhage,dehydration, GI losses, burns

Decreased cardiac output: arrhythmia, heart failure, MI, cardiogenic shock

Decreased vascular resistance: anaphylaxis, neuro injury, septic shock

Decreased renovascular blood flow: embolism, renal artery thrombosis

2. Intra -renal causes

Hemoglobinuria (transfusion reaction,hemolytic anemia, crush injury, burns,massive tissue injury).**Exposure to nephrotoxic agents** (Aminoglycoside antibiotics, heavy metals)

Acute glomerulonephritis, **Acute pyelonephritis**.

3. Post- renal causes

Benign prostatic hyperplasia

Bladder cancer

Calculi formation (kidney stones)

Trauma

Prostate cancer

Signs and Symptoms:

Lethargy

Persistent nausea, vomiting , and diarrhea.

Dry skin and mucus membranes.

The breath may have the odor of urine.

Drowsiness, headache , muscle twitching and convulsion

Scanty urinary output, with low specific gravity.

Daily rise in the serum creatinine value.

Severe hyperkalemia which may lead to dysrhythmias and cardiac arrest

Progressive acidosis.

Decrease in serum calcium level.

Anemia due to uremic ,gastrointestinal

lesions, reduced red cells life span and

reduced erythropoietin production.

Complications:

Potential complications of acute kidney failure include:

1.Fluid buildup. Acute kidney failure may leadto a buildup of fluid in lungs, which can cause shortness of breath.

2.Chest pain. If the lining that covers heart(pericardium) becomes inflamed, may experience chest pain.

3.Muscle weakness. When the body's fluids and electrolytes - body's blood chemistry — are out of balance, muscle weakness can result.

4.Permanent kidney damage. Occasionally, acute kidney failure causes permanent loss

of kidney function, or end-stage renal disease. People with end-stage renal disease require either permanent dialysis — or a kidney transplant to survive.

Management:

The goals of management are;

To restore normal chemical balance.

To prevent complications.

The treatment modalities include the followings:

1.Dialysis , hemodialysis, peritoneal dialysis.

2.Reduce potassium level by:

Monitoring serum electrolytes level.

ECG

3.Management of fluid balance by:

Daily body weight.

Measurement of serum and urine concentrations.

Intake and output recording.

Check blood pressure.

Check for any edema, or distension of jagular veins.

Dietary protein are limited to approximately 1 g/1 kgBW during oliguric phase and the high protein diet after the diuretic phase.

High carbohydrates, restricts foods and fluids containing potassium and phosphorus such as banana, juice, and coffee.

Bed rest to reduce patient's metabolic rate.

Nursing Considerations in AKI:

1.Fluid replacement therapy

2.Daily weight of patient

3.Monitor for hypervolaemia in oliguric phase and hypovolaemia in diuretic phase

4.Monitor potassium levels and ECG

5.Restrict potassium and sodium

6.Calcium supplements

7.monitor closely for signs of infection as this is a common cause of death with AKI