



## ACUTE RENAL FAILURE: A REVIEW ARTICLE

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## ABSTRACT

Acute kidney failure happens when your kidneys suddenly lose the ability to eliminate excess salts, fluids, and waste materials from the blood. This elimination is the core of our kidneys' main function. Body fluids can rise to dangerous levels when kidneys lose their filtering ability. The condition will also cause electrolytes and waste material to accumulate in your body, which can also be life-threatening.

## KEYWORDS :

## INTRODUCTION

Acute kidney failure is also called acute kidney injury or acute renal failure. It's common in people who are already in the hospital. It may develop rapidly over a few hours. It can also develop over a few days to weeks. People who are critically ill and need intensive care have the highest risk of developing acute kidney failure.

## DEFINITION

Acute renal failure is defined as the body fluids can rise to dangerous levels when kidneys lose their filtering ability. The condition will also cause electrolytes and waste material to accumulate in your body, which can also be life-threatening.

## CAUSES

Acute kidney failure can occur for many reasons. Among the most common reasons are:

- acute tubular necrosis (ATN)
- severe or sudden dehydration
- toxic kidney injury from poisons or certain medications
- autoimmune kidney diseases, such as acute nephritic syndrome and interstitial nephritis
- urinary tract obstruction

**Reduced blood flow can damage the kidneys. The following conditions can lead to decreased blood flow to your kidneys:**

- low blood pressure
- dehydration
- haemorrhage
- injury
- septic shock
- serious illness
- surgery
- burn

**Certain disorders can cause clotting within your kidney's blood vessels, and this can lead to acute kidney failure. These conditions include:**

- hemolytic uremic syndrome
- idiopathic thrombocytopenic thrombotic purpura (ITTP)
- malignant hypertension
- transfusion reaction
- scleroderma
- Some infections, such as septicemia and acute pyelonephritis, can directly injure your kidneys.
- Pregnancy can also cause complications that harm the kidneys, including placenta previa and placenta abruption.

## RISK FACTORS

The chances of acquiring acute kidney failure are greater if you're an older person or if you have any of the following long-term health problems:

- kidney disease
- liver disease
- diabetes, especially if it's not well controlled

- high blood pressure
- heart failure
- morbid obesity

## SIGNS AND SYMPTOMS

- bloody stools
- breath odour
- slow, sluggish movements
- generalized swelling or fluid retention
- fatigue
- pain between ribs and hips
- hand tremor
- bruising easily
- changes in mental status or mood, especially in older adults
- decreased appetite
- decreased sensation, especially in your hands or feet
- prolonged bleeding
- seizures
- nausea
- vomiting
- high blood pressure

## COMPLICATION

- chronic kidney failure
- heart damage
- nervous system damage
- end-stage renal failure

## DIAGNOSTIC EVALUATION

- If having acute kidney failure, may have generalized swelling. The swelling is due to fluid retention.
- Using a stethoscope, the doctor may hear crackling in the lungs. These sounds can signal fluid retention.
- Results of laboratory tests may also show abnormal values, which are new and different from baseline levels. Some of these tests include:
  - blood urea nitrogen (BUN)
  - serum potassium
  - serum sodium
  - estimated glomerular filtration rate (eGFR)
  - urinalysis
  - creatinine clearance
  - serum creatinine
- An ultrasound is the preferred method for diagnosing acute kidney failure. However, abdominal X-ray, abdominal CT scan, and abdominal MRI can help your doctor determine if there's a blockage in your urinary tract.
- Certain blood tests may also reveal underlying causes of acute kidney failure.

## MANAGEMENT

## MEDICAL MANAGEMENT

**Vitamin supplement**(example) T.folicacid 10 mg/oral od to be given.

**Vitamin D drug-** T.calcitriol.

**Calcium drug-** T.shellcal 500mg/oral/od

**Iron supplements-** T.auntrin 150 mg /oral/od

**Phosphate binder sachat** 500 mg /oral /bd

**Laxatives** –syp. Duphalac15 ml/oral /hs

**Anti hypertensive drugs-**T.amlong10 mg

**Beta -adrenergic blockers** -T.atenolol 10 mg /oral/ od

### Erythropoietin supplement

#### COLLABORATIVE CARE

#### NUTRITIONAL AND FLUID THERAPY

- Protein intake is restricted to about 1.2 to 1.3 g/kg/ day
- Sodium restricted to 2 to 3 g/day
- Potassium restriction depends upon the residual renal function.
- Potassium rich in banana, tender coconut should be avoided.
- Water intake is 1 to 1.5 lit/day

#### PHYSIOTHERAPIST

- Encourage to do range of motion exercise
- Encourage the client to involve in aerobic exercise.

#### SOCIAL WORKER

- They encouraged in social relationship with others
- It can help in the positive attitude with others.
- Patient rights to be followed.

#### RENAL REPLACEMENT THERAPY

- Hemodialysis
- Peritoneal dialysis

#### HEMODIALYSIS

- The client's toxin-laden blood is diverted into a dialyzer, cleaned, and then return to the client.
- Toxins diffuse across the membrane from the blood to the dialysate. Strict asepsis must be maintained throughout the procedure.
- One of the vital aspects of hemodialysis is the establishment and maintenance of adequate blood access without it, hemodialysis cannot be done.
- Major routes of access are central venous catheter for short term access and internal arteriovenous fistula and graft for chronic dialysis.
- Central venous catheter for hemodialysis are large-bore double-lumen catheter that are inserted percutaneously into the jugular, femoral, or subclavian vein.

#### EXTERNAL ARTERIOVENOUS SHUNT

- Surgery is done to place a rubber-like silicon cannula into the forearm or leg. The cannula are connected to form a "U" shape. Blood flows from the client's artery through the shunt into vein. This access can be created quickly and thus is particularly suitable when dialysis must be started immediately.
- The problems with shunts are accidental dislodgement, haemorrhage, and skin erosion.

#### INTERNAL ARTERIOVENOUS FISTULA

- The internal arteriovenous fistula is the access of choice for clients receiving chronic dialysis.
- The AVF is created through a surgical procedure in which an artery in the arm is anastomosed to a vein in an end-to-side, side-to-side, side-to-end, or end-to-end fashion.
- The result is an opening or fistula between a large artery and a large vein. The flow of arterial blood into the venous system causes the vein to become engorged. These fistulas require up to 6 weeks to mature before they can be used.

- **INTERNAL ARTERIOVENOUS GRAFT** is used for chronic dialysis when the AVF is not possible. In this approach, an

artificial graft (made of various synthetic and biologic materials) is used to create an artificial vein for blood flow. One end of the artificial graft is anastomosed to an artery, tunneled under the skin, and anastomosed to a vein. The graft can be used 2 weeks after insertion. Complications include clotting, aneurysms, and infection.

#### PERITONEAL DIALYSIS

- Peritoneal dialysis involves repeated cycles of instilling dialysate into the peritoneal cavity, allowing time for substance exchange, and then removing the dialysate.
- Its clearance is much slower than hemodialysis
- It can be easily managed at home and commonly allows the client more independence.

#### CONTRA-INDICATION

- Hypercatabolism, in which peritoneal dialysis cannot adequately clear uremic toxins.
- Obesity
- Poor condition of the peritoneal membrane due to adhesion or scarring.
- History of ruptured diverticula, abdominal disease, respiratory disease, recurrent episode of peritonitis, abdominal malignancies, severe vascular disease, back problems and extensive abdominal surgery with drains or tubes that may increase the risk of infection.

#### COMPLICATION OF LONG-TERM DIALYSIS

- Technical problems, such as blood leak, overheating of the dialysate solution, insufficient loss of fluid, improper concentration of salt in the dialysate, and clotting
- Hypotension
- Cardiac dysarrhythmias from potassium imbalance
- Air embolus
- Hemorrhage resulting from heparinization with particular concern for subdural, retroperitoneal, pericardial, and intraocular bleeding.
- Restless leg syndrome
- Pyrogenic reactions.

#### COMPLICATION OF PERITONEAL DIALYSIS

- Peritonitis
- Catheter-related complication
- Dialysis related complication

#### CONCLUSION

Acute renal failure is a serious medical condition that could complicate the course of many of your patients. The mortality rate from acute tubular necrosis is around 50% and hasn't changed much over the past 3 decades, despite significant advances in supportive care.

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