Prerenal Acute Kidney Injury Diagnosis and Management

Prerenal Acute Kidney Injury (AKI) arises due to hypoperfusion of the kidney. This condition can be diagnosed by a BUN:Creatinine ratio > 20:1, fractional excretion of sodium (FENa) < 1%, urine osmolality > 500 mOsm/kg, and hyaline casts in the urine. Patients are mostly treated with fluid replacement and renal function should be monitored closely. Diuretics may be indicated in some cases.



PLAY PICMONIC

Diagnostic Findings

BUN:Creatinine Ratio > 20:1
BUN and Cream with Ratio Greater-than (20) Dollar-bill and (1) Wand
A blood urea nitrogen (BUN) to creatinine ratio of more than 20:1 is often seen in prerenal acute kidney injury. This condition will elevate both BUN and creatinine, however BUN will increase more as it is reabsorbed by the kidney (whereas virtually all filtered creatinine stays in the tubules).

Fractional Excretion of Sodium (FENa) < 1%
FEMA Agent with Less-than (1) Wand
Fractional excretion of sodium (FENa) refers to the amount of sodium that is present in the urine. Recall that in prerenal acute kidney injury, the kidneys are hypoperfused. The kidneys aim to increase the total amount of fluids to restore adequate blood flow. They accomplish this by reabsorbing sodium and water. Since most of the sodium will be reabsorbed, there will be very little sodium left in the patient's urine, thus lowering FENa to lower than 1%.

Urine Osmolality > 500 mOsm/kg
Urine Greater-than (500) Race-car
Urine osmolality will typically be more than 500 mOsm per kilogram. This high concentration occurs because there is less solvent (i.e. urine) given the hypoperfused kidneys.

Hyaline Casts
Highlighter Cast
Hyaline casts are a common and nonspecific finding in patients with renal injury. They can indicate hypoperfused states.

Management

Fluid Replacement
IV Bag
Fluid replacement with normal saline is paramount to restoring lost blood volume initially. In severe cases, blood transfusion may be necessary.

Monitor Renal Function
Monitor with Kidneys
The patient's renal function should be closely monitored throughout the healing process. Some patients may progress through an oliguric phase, a polyuric phase, and finally a recovery phase.

Diuretics
Dice-Rocket
Although diuretics may seem counterintuitive, they may be considered in patients who are hypervolemic and not anuric. Diuretics will help pull fluid into the blood which is then excreted via the kidneys.

Sign up for FREE at picmonic.com