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Renal Stone

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لأن صحتك غالية
Zulekha Hospital
Your Health Matters

Kidney stones can form when urine contains too much of certain substances. These substances can create small crystals that become stones.

The biggest risk factor for kidney stones is dehydration.

Kidney stones may not produce symptoms until they begin to move down the tubes (ureters) through which urine empties into the bladder. When this happens, the stones can block the flow of urine out of the kidneys. This causes swelling of the kidney or kidneys, causing pain. The pain is usually severe.

Kidney stones are common. A person who has had kidney stones often gets them again in the future. Kidney stones often occur in premature infants.

Some types of stones tend to run in families. Certain kinds of stones can occur with bowel disease, ileal bypass for obesity, or renal tubule defects.

There are different types of kidney stones. The exact cause depends on the type of stone.

- Calcium stones are most common. They occur more often in men than in women, and usually appear between ages 20 - 30. They are likely to come back. Calcium can combine with other substances, such as oxalate (the most common substance), phosphate, or carbonate to form the stone. Oxalate is present in certain foods. Diseases of the small intestine increase the risk of forming calcium oxalate stones.
- Cystine stones can form in people who have cystinuria. This disorder runs in families and affects both men and women.
- Struvite stones are mostly found in women who have a urinary tract infection. These stones can grow very large and can block the kidney, ureter, or bladder.
- Uric acid stones are more common in men than in women. They can occur with gout or chemotherapy.

Other substances also can form stones.

Symptoms

The main symptom is severe pain that starts suddenly and may go away suddenly:

- Pain may be felt in the belly area or side of the back
- Pain may move to groin area (groin pain) or testicles (testicle pain)

Other symptoms can include:

1. Abnormal urine color
2. Blood in the urine
3. Chills

4. Fever
5. Nausea
6. Vomiting

Diagnosis for Renal Stones includes:

1. Blood investigations

2. Urine Analysis

3. Radiology Studies

    a. **Plain X-ray**

    b. **Ultrasound:** Ultrasound imaging is useful as it gives details about the presence of hydronephrosis (swelling of the kidney—suggesting the stone is blocking the outflow of urine). It can also be used to detect stones during pregnancy when x-rays or CT are discouraged.

    c. **Intravenous Pyelogram:** This may be followed by an Intravenous Pyelogram which requires about 50 ml of a special dye to be injected into the bloodstream that is excreted by the kidneys and by its density helps outline any stone on a repeated X-ray

    d. **CT scan:** CT scan is diagnostic test for the detection of kidney stones. All stones are detectable by CT except very rare stones composed of certain drug residues in the urine.

Treatment

The goal of treatment is to relieve symptoms and prevent further symptoms. (Kidney stones that are small enough usually pass on their own.) Treatment varies depending on the type of stone and how severe the symptoms are. People with severe symptoms might need to be hospitalized.

When the stone passes, the urine should be strained and the stone saved and tested to determine the type.

Drink at least 6 - 8 glasses of water per day to produce a large amount of urine. Some people might need to get fluids through a vein (intravenous).

Pain relievers can help control the pain of passing the stones (renal colic). For severe pain, you may need to take narcotic pain killers or nonsteroidal anti-inflammatory drugs (NSAIDS) such as ibuprofen.

Depending on the type of stone, your doctor may prescribe medicine to decrease stone formation or help break down and remove the material that is causing the stone. In addition treatment will include management of pain with pain killers (provided kidney functions are normal), Dietary restrictions and liberal fluid intake.

Surgery is indicated

- in case the stone size is more than 7 mm
- when adequate pain is not achieved

- when there is stone obstruction with infection and
- In cases where patients have a single kidney with obstructions.

Today, most treatments are much less invasive than in the past.

- Extracorporeal shock-wave lithotripsy is used to remove stones slightly smaller than a half an inch that are located near the kidney. This method uses ultrasonic waves or shock waves to break up stones. Then, the stones leave the body in the urine.
- Percutaneous nephrolithotomy is used for large stones in or near the kidney, or when the kidneys or surrounding areas are incorrectly formed. The stone is removed with an endoscope that is inserted into the kidney through a small opening.
- Ureteroscopy may be used for stones in the lower urinary tract.
- Standard open surgery (nephrolithotomy) may be needed if other methods do not work or are not possible.

Expectations (prognosis)

Kidney stones are painful but usually can be removed from the body without causing permanent damage. They tend to return, especially if the cause is not found and treated.

Complications

- Decrease or loss of function in the affected kidney
- Kidney damage, scarring
- Obstruction of the ureter (acute unilateral obstructive uropathy)
- Recurrence of stones
- Urinary tract infection

Prevention

- Preventive strategies include dietary modifications and sometimes also taking drugs with the goal of reducing excretory load on the kidneys
- Drinking enough water to make 2 to 2.5 liters of urine per day.
- A diet low in protein, nitrogen and sodium intake.
- Restriction of oxalate-rich foods, such as chocolate, nuts, soybeans and spinach, plus maintenance of an adequate intake of dietary calcium.
- There is equivocal evidence that calcium supplements increase the risk of stone formation, though calcium citrate appears to carry the lowest, if any, risk.
- Taking drugs such as tizzies, potassium citrate, magnesium citrate and allopurinol, depending on the cause of stone formation.
- Some fruit juices, such as orange, blackcurrant, and cranberry, may be useful for lowering the risk factors for specific types of stones.
- Avoidance of cola beverages.
- Avoiding large doses of vitamin C.