CONDITION

Interstitial nephritis

Interstitial nephritis is inflammation of the kidney tubules and the tissue around them.

WHAT IT IS
Inflammation of kidney tubules and surrounding tissue

BODY SYSTEM
Kidneys and urinary system

MAIN SYMPTOMS
Fatigue, nausea, reduced urine, swelling

WHAT CAUSES IT
Medicines, infections, immune reactions, or chronic urinary problems

HOW IT IS DIAGNOSED
Blood and urine tests; kidney biopsy can confirm

MAIN TREATMENT
Remove the cause, supportive care, sometimes corticosteroids

CAN IT BE CURED?
Sometimes - acute cases may fully recover

IS IT AN EMERGENCY?
Sometimes - very low urine or breathing difficulty

LONG-TERM OUTLOOK
Often recovery, but some develop chronic kidney disease

Overview

Interstitial nephritis is inflammation in the spaces between the kidney's tiny filtering tubes. These tubes help remove waste and control the balance of water, salts, and acids in your body. The condition is also called tubulointerstitial nephritis.

The inflammation can reduce how well the kidneys work. This may cause acute kidney injury , meaning kidney function falls over hours, days, or weeks. Some people have few noticeable symptoms, so the problem is first found through blood or urine tests.

Acute interstitial nephritis often develops after a reaction to a medicine. It can also result from an infection or an immune condition. Removing or treating the cause may allow kidney function to improve.

Chronic interstitial nephritis develops more slowly. Long-lasting inflammation or repeated

injury can cause kidney scarring. This damage may not be fully reversible and can lead to chronic kidney disease.

Interstitial nephritis is different from a kidney infection, although infection can sometimes trigger it. It is also different from glomerulonephritis, which mainly affects the kidney's microscopic blood-filtering units.

Symptoms

Symptoms differ according to how quickly the inflammation develops and how much kidney function is affected. Some people have no symptoms beyond an abnormal blood test.

Possible symptoms include:

Fever, rash, and joint pain can suggest a medicine-related immune reaction, but many people do not have all three. Their absence does not rule out interstitial nephritis.

Changes in kidney function can also disturb levels of potassium, acid, and other substances in the blood. These changes may not cause early symptoms but can become serious if they are severe.

Chronic interstitial nephritis may cause gradual tiredness, increased thirst, frequent urination, or waking at night to urinate. Symptoms may appear only after substantial kidney damage has occurred.

- Tiredness, weakness, or difficulty concentrating
- Nausea, poor appetite, or vomiting
- Passing less urine than usual
- Swelling around the ankles, legs, hands, or face
- Fever, rash, or aching joints
- Pain in the side or lower back
- Blood or unusual cloudiness in the urine

Causes and risk factors

Medicines are a common cause of acute interstitial nephritis. The inflammation is usually an immune reaction rather than direct poisoning of the kidneys. It can begin soon after a medicine is started, but it may also appear after weeks or months.

Medicines associated with the condition include some antibiotics like amoxicillin or

doxycycline , nonsteroidal anti-inflammatory drugs such as ibuprofen and naproxen, and proton pump inhibitors like omeprazole or lansoprazole used for acid reflux. Several other medicines can also cause it. Most people who take these medicines do not develop interstitial nephritis.

Other causes include:

In some cases, no clear cause is found.

Your risk may be higher if you already have reduced kidney function, take several medicines, or have an immune condition. However, interstitial nephritis can occur without an obvious risk factor.

- Bacterial, viral, or other infections
- Immune conditions such as Sjögren syndrome, sarcoidosis, or lupus
- A condition affecting the eyes and kidneys called TINU syndrome
- Long-term blockage of urine flow
- Repeated urinary infections or urine flowing backward toward the kidneys
- Long-term exposure to certain toxins or kidney-damaging substances

Diagnosis

A clinician will ask about your symptoms, recent infections, medical conditions, and every medicine or supplement you use. Include nonprescription pain relievers and medicines you may have stopped recently because a reaction can continue after the trigger is removed.

A blood test measures creatinine, a waste product normally cleared by the kidneys. A rising creatinine level can show that kidney filtration has worsened. Other blood tests check potassium, acid balance, blood cell counts, and signs of infection or inflammation.

Urine testing may find white blood cells, red blood cells, or small amounts of protein. A urine culture can help determine whether a urinary infection is present. Urine eosinophil tests are sometimes used, but they cannot reliably confirm or exclude interstitial nephritis.

An ultrasound may check kidney size and look for a blockage. Imaging can support the assessment, but it does not usually confirm the inflammation itself.

A kidney biopsy is the test that can confirm interstitial nephritis. During a biopsy, a needle removes a very small sample of kidney tissue for examination under a microscope. A biopsy is not necessary in every case. It may be considered when the diagnosis is uncertain, kidney function is worsening, or the result would affect treatment.

Treatment and management

Treatment focuses on removing or controlling the cause while supporting the kidneys.

If a medicine is suspected, the prescribing clinician will usually review whether it should be stopped or replaced. Do not restart a suspected medicine unless a clinician who knows about the reaction says it is safe. Do not stop an essential prescribed medicine on your own unless you have been told to do so or are receiving emergency care for a severe reaction.

An infection may require targeted treatment. If an immune condition is responsible, treatment is directed at that condition.

Corticosteroids like prednisone or hydrocortisone , which reduce immune inflammation, may be considered for some people with acute interstitial nephritis. They are not needed in every case, and the evidence for their use is not equally strong in all situations. The decision may take account of the likely cause, biopsy findings, severity, time since onset, and whether kidney function improves after the trigger is removed.

Supportive care may include:

Dialysis may be needed if severe kidney injury causes dangerous chemical changes, fluid buildup, or very low urine output. Dialysis filters waste and extra fluid from the blood. When interstitial nephritis is acute, dialysis may be temporary, but this cannot be guaranteed.

Chronic interstitial nephritis is managed by treating any ongoing cause and protecting remaining kidney function. Care may include blood pressure management and monitoring for complications of chronic kidney disease.

- Monitoring kidney function, urine output, and blood pressure
- Managing fluid, potassium, and acid levels
- Temporarily changing medicines cleared through the kidneys
- Avoiding additional substances that could stress the kidneys
- Treating nausea, swelling, or other symptoms

Complications

The main complication is lasting loss of kidney function. Some people recover completely, while others are left with a lower level of kidney function than before.

Possible complications include:

The likelihood of recovery is influenced by the cause, how long inflammation was present, the

amount of scarring, and how severely kidney function was affected.

- Acute kidney injury
- Chronic kidney disease and kidney scarring
- High potassium or abnormal acid levels
- Fluid buildup and high blood pressure
- Kidney failure requiring dialysis or transplantation

Prevention

Not every case can be prevented. Immune reactions to medicines are often unpredictable, and interstitial nephritis caused by an immune condition may occur despite appropriate care.

You can reduce avoidable kidney stress by using nonprescription pain relievers only as directed and checking whether they are suitable if you have kidney problems. Keep an up-to-date list of medicines, supplements, and previous drug reactions.

Attend recommended blood tests when taking a medicine that needs kidney monitoring. Seek advice if you develop a new rash, fever, major change in urination, or unexplained illness after starting a medicine.

If a medicine has caused interstitial nephritis, make sure the reaction is recorded in your medical and pharmacy records. Avoid taking it again unless a specialist has reviewed the situation.

Living with it and what to expect

In acute interstitial nephritis, kidney function may begin improving after the trigger is removed. Recovery can take weeks or months. Blood tests are usually repeated during this period because symptoms alone cannot show whether the kidneys have recovered.

Some people regain their previous kidney function. Others have persistent damage, especially when diagnosis was delayed or a biopsy shows substantial scarring. Follow-up may continue even after symptoms settle.

Chronic interstitial nephritis usually changes more slowly. Existing scar tissue generally does not return to normal, but treating the cause and protecting kidney function may slow further loss. You may need regular checks of kidney function, blood pressure, urine protein, and blood salts.

Most daily activities can continue as you recover, guided by how you feel and the severity of kidney injury. Dietary or fluid restrictions are not the same for everyone. They are usually needed only when blood results, swelling, blood pressure, or reduced kidney function make them appropriate.

When to get medical help

Arrange prompt medical assessment if you have a noticeable decrease in urine, new swelling, persistent vomiting, blood in your urine, or unexplained fever and rash after starting a medicine. These symptoms have several possible causes and need assessment rather than self-diagnosis.

If you have recently been diagnosed, contact your care team promptly if symptoms worsen, you cannot keep fluids down, or your urine output falls. Keep scheduled blood tests even when you feel better.

Seek emergency help for:

These may indicate severe kidney dysfunction or a serious medicine reaction.

- Severe difficulty breathing
- Chest pain, collapse, or a seizure
- New confusion or extreme drowsiness
- Little or no urine with rapidly increasing swelling
- Swelling of the face or throat, wheezing, or widespread blistering rash

Common questions

Is interstitial nephritis the same as a kidney infection?

No. Interstitial nephritis is inflammation around the kidney tubules. A kidney infection is caused by germs within the urinary tract and kidney. Infection can sometimes trigger interstitial nephritis, so tests may be needed to tell them apart.

Can interstitial nephritis go away?

Acute cases can improve when the cause is identified and removed early. Recovery may be complete or partial. Chronic inflammation can leave permanent scarring, so it is less likely to go away fully.

Which medicines can cause interstitial nephritis?

Reported triggers include some antibiotics, anti-inflammatory pain relievers, and acid-reducing proton pump inhibitors. Other medicines can also be responsible. The timing and your full medication history matter more than any single list.

Should I stop my medicine if I think it caused this?

Contact the prescribing clinician promptly for advice. Suddenly stopping certain medicines can be harmful. If you have trouble breathing, facial swelling, collapse, or a severe blistering rash, seek emergency help instead.

Does interstitial nephritis always require a kidney biopsy?

No. A clinician may make a working diagnosis from the timing, medicine history, blood tests, urine findings, and response to removing a suspected cause. A biopsy may be needed when the diagnosis is uncertain or the result would change treatment.

Will I need dialysis?

Most people do not automatically need dialysis. It is used when kidney injury causes severe fluid overload, dangerous blood chemistry changes, or other complications that cannot be managed safely in another way.

Sources

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