CONDITION

Acute nephritic syndrome

Learn how acute nephritic syndrome affects the kidneys, including possible symptoms, causes, diagnostic tests, treatment, complications, and follow-up care.

WHAT IT IS
Sudden inflammation of the kidney filters

BODY SYSTEM
Kidneys and urinary system

MAIN SYMPTOMS
Blood in urine, reduced urine output, swelling, high blood pressure

WHAT CAUSES IT
Abnormal immune activity, sometimes infection-related

HOW IT IS DIAGNOSED
Urine and blood tests, sometimes kidney biopsy

MAIN TREATMENT
Supportive care and cause-specific treatment

CAN IT BE CURED?
Sometimes - some people recover fully

IS IT AN EMERGENCY?
Sometimes - little to no urine

LONG-TERM OUTLOOK
Full recovery, chronic kidney disease, or kidney failure

Overview

Acute nephritic syndrome is a group of signs and symptoms caused by sudden inflammation in the kidneys' filtering units. These tiny filters are called glomeruli . When they become inflamed, blood and protein can leak into the urine, and the kidneys may have trouble removing extra fluid and waste from the body.

Acute nephritic syndrome is not one specific disease. It is a pattern that can result from several conditions, including infections, autoimmune diseases, and disorders in which the immune system attacks kidney tissue.

Common features include blood in the urine, reduced urine output, swelling, high blood pressure, and a decline in kidney function. Some people have mild changes found during urine testing. Others develop more serious fluid buildup or acute kidney injury, meaning kidney

function worsens over hours to days.

Prompt medical assessment matters because treatment depends on the cause. Some infection-related cases improve with supportive care, while autoimmune conditions may require medicines that reduce immune-system activity. A rapidly worsening form, called rapidly progressive glomerulonephritis , can cause major kidney damage over days or weeks and requires urgent specialist care.

Symptoms

Symptoms may appear suddenly or develop over several days. They can occur during an infection, shortly after an infection, or without an obvious trigger.

Possible symptoms include:

Blood in the urine may be microscopic, meaning it cannot be seen without a urine test. The amount of protein can vary. It is often lower than in nephrotic syndrome, another kidney-filter disorder, but the two patterns can overlap.

Seek urgent medical assessment for visible blood in the urine, a clear decrease in urine output, new swelling, or symptoms occurring after a recent infection. These findings have several possible causes and do not confirm acute nephritic syndrome on their own.

Go to an emergency department or call emergency services for severe trouble breathing, chest pain, fainting, a seizure, marked confusion, coughing up blood, or little to no urine. Severe headache or vision changes with very high blood pressure also require emergency care.

- Pink, red, brown, or tea-colored urine caused by blood
- Urine that looks foamy because it contains excess protein
- Passing less urine than usual
- Swelling around the eyes, especially in the morning
- Swelling in the legs, ankles, feet, or abdomen
- Rapid weight gain caused by retained fluid
- High blood pressure
- Headache, nausea, tiredness, or reduced appetite
- Shortness of breath if fluid collects in or around the lungs
- Fever, joint pain, rash, coughing up blood, or sinus symptoms when a wider inflammatory illness is involved

Causes and risk factors

Most causes involve abnormal immune activity within the glomeruli. Antibodies and other immune proteins may collect in the filters or mistakenly attack part of the kidney. This activates inflammation and can damage the glomerular walls.

Possible causes include:

Risk depends on the underlying disease. A recent streptococcal infection may raise the likelihood of post-infectious disease. A known autoimmune condition, chronic infection, or family history of some glomerular diseases may also be relevant.

Acute nephritic syndrome is not usually caused by drinking too little water or by a single dietary choice. However, medicines and other exposures can sometimes contribute to kidney injury or make fluid balance and blood pressure harder to control. A clinician should review all prescription medicines, over-the-counter products, and supplements.

- Infection-related glomerulonephritis: Kidney inflammation may occur during or after an infection. Post-streptococcal glomerulonephritis can follow certain throat or skin infections caused by group A Streptococcus . Other bacterial and viral infections can also be associated with glomerulonephritis.
- IgA nephropathy: The antibody immunoglobulin A, or IgA, collects in the glomeruli. Episodes of visible blood in the urine may occur during or soon after a respiratory or digestive infection.
- Lupus nephritis: Systemic lupus erythematosus can cause the immune system to inflame the kidneys and other organs.
- ANCA-associated vasculitis: This is a group of autoimmune diseases that inflame small blood vessels. It may affect the kidneys along with the lungs, sinuses, skin, nerves, or other organs. ANCA refers to an antibody that may be found in blood testing.
- Anti-GBM disease: Antibodies attack the glomerular basement membrane, a supporting layer in the kidney filters. The lungs may also be affected.
- Other immune-complex diseases: Certain blood disorders, chronic infections, and inflammatory conditions can produce immune proteins that settle in the kidneys.

Diagnosis

Diagnosis begins with a medical history and physical examination. A clinician may ask about recent infections, rashes, joint symptoms, sinus or lung problems, medicine use, autoimmune disease, and changes in urine output. Blood pressure, weight, swelling, and breathing are

assessed.

A urinalysis checks for blood, protein, and other findings. Under a microscope, misshapen red blood cells or red blood cell casts may suggest that bleeding is coming from the glomeruli. Casts are tiny tube-shaped particles formed inside the kidneys.

A urine protein measurement helps show how much protein is being lost. This may be measured using a spot urine sample rather than a full-day collection.

Blood tests commonly assess creatinine and estimated glomerular filtration rate, or eGFR. These indicate how well the kidneys are filtering. Other tests may check electrolytes, blood counts, albumin, and signs of inflammation.

Testing for the cause is selected according to the person's history and findings. It may include complement proteins, streptococcal antibodies, IgA-related testing, antinuclear antibodies, ANCA, anti-GBM antibodies, hepatitis tests, or blood cultures when a bloodstream infection is suspected. No single blood test identifies every cause.

Ultrasound may be used to examine kidney size and rule out a urinary blockage. It cannot usually determine the exact type of glomerular inflammation.

A kidney biopsy may be needed when kidney function is declining, the cause remains uncertain, or an immune-mediated disease is suspected. During a biopsy, a small sample of kidney tissue is removed with a needle and examined under a microscope. The results can show the pattern and severity of injury and help guide treatment. Not every person with acute nephritic syndrome needs a biopsy.

Treatment and management

Treatment has two goals: protect the body while the kidneys recover and address the underlying cause. The plan depends on kidney function, blood pressure, fluid buildup, biopsy findings, and the specific disease.

Supportive care may include limiting dietary sodium to reduce fluid retention, monitoring fluid intake, and checking body weight and blood pressure. A clinician may recommend a temporary fluid limit when urine output is low or swelling is significant. These changes should be individualized rather than started as a restrictive diet without guidance.

Medicines may be used to remove extra fluid and control blood pressure. Some blood pressure medicines can also reduce protein loss, but they may not be suitable during certain stages of acute kidney injury. Kidney function and potassium often need to be checked after treatment changes.

An active bacterial infection may require antibiotics like amoxicillin or doxycycline . Antibiotics treat the infection and help prevent spread, but they do not necessarily reverse kidney inflammation that has already developed. Treatment differs when the kidney problem follows an infection that is no longer active.

Autoimmune causes may require corticosteroids or other medicines that suppress immune activity. These treatments carry meaningful risks, including infection, and should be chosen by clinicians familiar with the specific disease. The diagnosis is often confirmed with blood tests and a kidney biopsy before longer-term immune treatment begins.

Plasma exchange, a procedure that removes and replaces part of the liquid portion of blood, may be considered in selected severe immune-mediated conditions, particularly anti-GBM disease. Its role varies in other diseases and depends on the clinical situation.

Temporary dialysis may be needed if the kidneys cannot safely control fluid, potassium, acid levels, or waste products. Dialysis does not always mean kidney failure will be permanent. Some people recover enough kidney function to stop it.

People with significant acute nephritic syndrome are often treated with input from a nephrologist, a doctor who specializes in kidney disease.

Complications

Possible complications depend on the speed and severity of kidney injury.

Fluid retention can cause severe swelling or pulmonary edema, which is fluid buildup in the lungs. High blood pressure may become difficult to control and can place strain on the heart, brain, and blood vessels.

Reduced kidney filtering may lead to high potassium, excess acid in the blood, or a buildup of waste products. Severe disturbances can affect heart rhythm, breathing, alertness, or other body functions.

Some people recover fully. Others continue to have blood or protein in the urine even after symptoms improve. Persistent inflammation or scarring may lead to chronic kidney disease. A smaller group develops kidney failure requiring long-term dialysis or kidney transplantation.

The underlying illness can also cause complications outside the kidneys. For example, vasculitis or anti-GBM disease may produce bleeding in the lungs, while lupus can affect the skin, joints, blood cells, nervous system, and other organs.

Follow up

Follow-up usually includes blood pressure checks and repeat blood and urine tests. Creatinine and eGFR show whether kidney filtration is recovering. Urine testing tracks blood and protein, while electrolyte tests help identify problems such as high potassium.

Body weight and swelling may be monitored during recovery. A clinician may also review medicines because doses or choices sometimes need adjustment when kidney function changes. Nonsteroidal anti-inflammatory drugs, such as ibuprofen and naproxen, can worsen some forms of acute kidney injury and should not be used without medical guidance in this setting.

Routine follow-up remains important even when urine color, swelling, or energy improves. Urine abnormalities and high blood pressure can continue without noticeable symptoms. The follow-up schedule depends on the cause, the severity of the initial illness, and how quickly kidney function returns.

Contact the treating clinician promptly if swelling returns, urine output falls, visible blood reappears, weight rises quickly, or blood pressure is much higher than the target provided by the care team.

Emergency symptoms are different from routine follow-up concerns. Severe shortness of breath, chest pain, a seizure, confusion, coughing up blood, or little to no urine requires immediate emergency care.

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