What is nephrotic syndrome?

Nephrotic syndrome is a syndrome comprising the following:

- Edema - swelling of the face, legs, or ankles due to the abnormal collection of fluids in the tissues that is usually accompanied by rapid weight gain
- Proteinuria - large amount of protein contained in urine (more than 3 to 3.5g/day) that can be identified by frothy or foamy urine in the toilet bowl.
- Hypoalbumina - low level of albumin (less than 30g/L) in the blood

How does it develop?

There are millions of tiny filters called glomeruli in the kidneys that help filter out waste products and retain large molecules like protein from the blood. Damage to the glomeruli allows proteins in the blood (such as albumin) to leak into the urine, causing increased excretion of protein (proteinuria), and eventually reduced blood levels of albumin. Accompanying abnormalities of kidney function lead to accumulation of fluid in the tissues (edema).

What causes it?

Nephrotic syndrome can be primary, meaning damage is confined to the kidneys alone, or it can be secondary, meaning organs other than the kidney are also affected.

Primary causes

- Minimal change disease (MCD) is a kidney disease that can occur in both adults and children. The disease gets its name because the damage to the glomeruli cannot be seen under a regular microscope and can only be seen under a powerful microscope called an electron microscope
- Focal segmental glomerulosclerosis (FSGS) is the most common cause of nephrotic syndrome in adults. FSGS can cause collapse and scarring of some glomeruli
- Membranous nephropathy (MN) is a condition in which the walls of the glomerular blood vessels become thickened

Secondary causes

- Diabetes mellitus causing diabetic kidney disease is common in patients with diabetes who have chronically elevated blood glucose levels and/or high blood pressure. Patients with more advanced disease can develop the nephrotic syndrome
- Systemic lupus erythematosus (SLE) is an autoimmune disease that can affect multiple organs of the body, including the kidney, causing nephrotic syndrome

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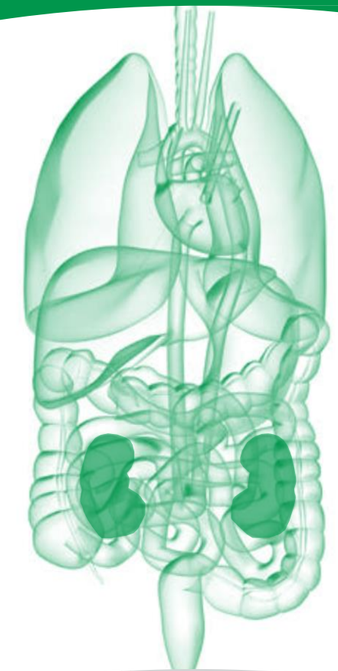
DEPARTMENT OF RENAL MEDICINE

All you need to know about Nephrotic Syndrome



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How is itdiagnosed?

- Urine tests to determine the amount of protein in the urine
- Blood tests to assess kidney function, look for auto-antibodies, and other associated conditions such as viral infections
- Imaging of the kidneys and other organs if necessary
- Renal biopsy is a procedure done under local anesthesia and guided by ultrasound to obtain a small sample of kidney tissue for microscopic examination

What else can it associated with?

- Impaired kidney function — some patients can have a gradual decline in kidney function, which causes no symptoms in the early stages. However, as kidney function continues to worsen, symptoms of kidney failure can develop, including shortness of breath, weakness, tiredness and loss of appetite
- Elevated Blood lipids — the concentration of lipids (cholesterol and/or triglycerides) can become greatly elevated and may increase the risk of coronary artery disease
- Risk of developing blood clots due to the loss of anti-clotting factor proteins
- Risk of developing infection due to the loss of protective immunoglobulins in the urine

How is ittreated?

General treatment of the symptoms of nephroticsyndrome

- Diuretics to help get rid of excess water and salt
- Dietary salt restriction
- Medications such as ACE inhibitors or angiotension receptor blockers (ARB) to lower blood pressure, prevent worsening of kidney disease, and reduce the amount of protein excreted in the urine
- Anticoagulation therapy (Blood thinners) to prevent blood clots if the protein leak is significant

Acute treatment

- Immunosuppressant: medication that alter the body's immune system to reduce the damage to the kidney cells. These medications often have side effects
- Renal replacement therapy in the form of dialysis may be required if the kidney function is severely impaired

Treating the underlying disease

- Minimal change disease (MCD) almost always responds initially to treatment with glucocorticoids (steroids). However, relapses are common, and additional treatment with other immunosuppressants may be required to maintain remission
- Focal segmental glomerulosclerosis (FSGS) can be classified as primary FSGS or Secondary FSGS. The treatment of primary FSGS is similar to MCD. Secondary FSGS is treated primarily with ACE inhibitors or ARBs
- Membranous nephropathy (MN) — for patients with mild symptoms, a period of "watch and wait" is recommended initially to determine if the condition is worsening or causing complications. Immunosuppressive treatment is generally held off for a period of about 6 months until/unless symptoms worsen. However if the patient has severe symptoms from the start or if the condition progresses while under monitoring, treatment should be started.
- Diabetes mellitus — Management includes intensive management of blood sugar levels, cholesterol, and blood pressure.
- Lupus — Patients with lupus who have nephrotic syndrome or evidence ofworsening kidney function can be treated with steroids and immunosuppressants

What is the long term outlook for patients with nephrotic syndrome?

The long-term outlook of patients with nephrotic syndrome depends on the underlying cause, when the diagnosis was made, and the patient's general health. If diagnosed early, there are many options for controlling the disease. If inflammation and scarring have become extensive and irreversible, long-term renal replacement therapy may be necessary to treat the disease.

Patients who respond to treatment and go into remission generally have a good prognosis. However, regular monitoring of blood and urine tests and follow-up are important as the disease can relapse or progress to a more serious stage requiring repeated treatment.

Patients on active immunosuppressants will need to see the doctor frequently to monitor kidney function, the degree of protein leakage in the urine as well as complications oftreatment.