

## **GLOMERULAR DISEASES**

Healthy people have two kidneys. The kidneys are near the middle part of the back, just below the rib cage, to the left and to the right of the spinal column. The kidneys act as the body's filters. Every day approximately 378 liters of blood are filtered to eliminate around 2 liters of wastes and liquids that leave the body in the form of urine. The blood enters the kidneys through the arteries that branch out inside the kidney and form minute clusters of meandering blood vessels. Each cluster is given the name of glomerule. There are approximately one million glomerules in each kidney. Each glomerule is connected to the opening of a small collection tube called tubule. The blood is filtered in the glomerule, and the additional liquid and wastes go to the tubule, where they are converted into urine. Finally, the urine goes out of the kidneys and goes to the bladder through larger tubes known as ureters.

Each unit comprised of a glomerule and a tubule is called a nephron. Each kidney is made up of approximately one million nephrons. In healthy nephrons, the glomerular membrane that separates the blood vessel from the tubule allows the wastes and additional liquid go to the tubule but for blood corpuscles, proteins and nutrients to remain in the bloodstream.

Glomerular diseases are divided into two main categories: glomerulonephritis and glomerulosclerosis. Glomerulonephritis refers to inflammation of the tissue of the membrane that acts as the filter that separates the wastes and additional liquid from the blood in each glomerule.

Glomerulosclerosis refers to fibrosis or hardening of the minute blood vessels inside the kidney.

There are different diseases that can cause glomerular disease. It may be caused by an infection or a medication that is toxic to the kidneys. It may be the result of a disease that affects the entire body, such as diabetes or lupus. Some diseases can cause both glomerulonephritis, as well as glomerulosclerosis. Although glomerulonephritis and glomerulosclerosis can have different causes, both cause terminal kidney disease (TKD).

Glomerular diseases damage the glomerules and thus allow protein and occasionally red corpuscles to filter into urine. Glomerular diseases also can interfere with renal waste elimination and make wastes begin to accumulate in the blood. Urinary loss of blood proteins can cause a decrease in the level of proteins in the body. Under normal conditions, albumin, one of the proteins found in the blood, acts as a sponge and extracts the additional liquid from the body tissue to put it into the bloodstream. The liquid remains in the bloodstream until the kidneys eliminate it. When albumin filters into the urine, the blood loses its ability to absorb additional liquid from the body. The liquid can accumulate in the face, hands, feet or ankles and cause swelling.

### Signs and symptoms of glomerular disease

- Edema: swelling in some parts of the body.
- Proteinuria: presence of large amounts of protein in the urine, which can cause the production of foamy urine.
- Hematuria: presence of blood in the urine (urine can take on a pink or cola color).
- Inefficient filtration of wastes from the blood (which causes the accumulation of wastes in the blood).
- Hypoproteinemia: low levels of protein in the blood.

### Diagnosis of glomerular diseases

A urine test (lab test) measures the levels of protein and red corpuscles in the urine and thus provides information about renal damage. Blood tests that measure the level of wastes, such as creatinine (waste from muscle breakdown) and urea nitrogen, can determine whether the kidney's filtration ability is damaged. If these lab tests indicate renal damage, the doctor may recommend that you have an echogram or an X-ray of the kidneys done to determine if their shape or size is abnormal. A renal biopsy may be performed to confirm the presence of glomerular disease and identify the cause.