



The Body and Lupus **Lupus and the Renal System**

Lupus is an autoimmune disease that can affect almost any part of your body, most often your joints, skin, kidneys, heart, lungs, blood, or brain. Your two kidneys are part of your renal system, which also includes two ureters, the bladder, and the urethra. As the primary organs of the renal system your kidneys are responsible for:

- Maintaining the correct amount and type of body fluids
- Getting rid of waste products and toxic substances
- Regulating the hormones (chemical messengers) that help control blood pressure and blood volume

Lupus Nephritis

Inflammation of the nephrons, the structures within the kidneys that filter the blood, is called glomerulonephritis, or nephritis. Lupus nephritis is the term used when lupus causes inflammation in your kidneys, making them unable to properly remove waste from your blood or control the amount of fluids in your body. Abnormal levels of waste can build up in the blood, and edema (swelling) can develop. Left untreated, nephritis can lead to scarring and permanent damage to the kidneys and possibly end-stage renal disease (ESRD). People with ESRD need regular filtering of their body's waste done by a machine (dialysis) or a kidney transplant so that at least one kidney is working properly.

Lupus nephritis most often develops within the first five years after the symptoms of lupus start, and usually affects people between the ages of 20 and 40. It is estimated that as many as 40 percent of all people with lupus, and as many as two-thirds of all children with lupus, will develop kidney complications that require medical evaluation and treatment. Because there are so few symptoms of kidney disease, significant damage to your kidneys can happen before you are diagnosed with lupus.

In the early stages of lupus nephritis, there are very few signs that anything is wrong. Often the first symptoms of lupus nephritis are weight gain and puffiness in your feet, ankles, legs, hands, and/or eyelids. This swelling often becomes worse throughout the day. Also, your urine may be foamy or frothy, or have a red color. Often the first signs of lupus nephritis show up in clinical laboratory tests on the urine. That is why testing your urine is so important.

Nephrologists are the physicians who treat the renal system. The tests they will use to diagnose lupus nephritis are: collection of urine, usually over a 24-hour period; blood tests; and often, a kidney biopsy.

Urinalysis

Because your body's waste matter is processed by your kidneys, testing a sample of your urine can show any problems in the way your kidneys are functioning. The most common tests look for cell casts (fragments of cells normally found in the blood, or fragments of the tubules of the kidneys) and proteinuria (protein being spilled into your body because your kidneys are not filtering the waste properly).

Blood Tests

Certain blood tests can provide information about kidney damage and how well your body is filtering waste. The creatinine blood test is usually ordered along with a blood urea nitrogen (BUN) test to assess kidney function. A combination of blood and urine creatinine levels may be used to calculate a creatinine clearance. This measures how effectively your kidneys are filtering small molecules like creatinine out of your blood. Serum creatinine measurements (along with your age, weight, and gender) are used to calculate the estimated glomerular filtration rate (EGFR), which is used as a screening test for evidence of kidney damage.

Kidney Biopsy

A kidney biopsy is done in a hospital. While you lie on your stomach your nephrologist will insert a very thin, long needle through the skin of your back and remove a tiny piece of tissue from one of your kidneys. The tissue will be examined under a microscope to determine how much inflammation or scarring is present.

Treatments

Even though lupus nephritis is among the more serious complications of lupus, there are effective treatments. Prednisone and other corticosteroids are generally prescribed to stop the inflammation. Immunosuppressive drugs may also be used (with or in place of steroid treatments) such as cyclophosphamide (Cytoxan), azathioprine (Imuran), cyclosporin A, and mycophenolate mofetil (CellCept). Medications developed for other illnesses are also being studied as treatments for lupus nephritis, including rituximab (Rituxan), eculizumab (Soliris), and abetimus sodium (Riquent).

Other Lupus-Related Kidney Disorders

Not all kidney problems in people with lupus are due to nephritis.

Infections of the urinary tract, causing frequent urination or burning when urinating, are quite common.

Fluid retention or even loss of kidney function can be a side-effect of non-steroidal anti-inflammatory drugs (NSAIDs) and medications such as aspirin.

Interstitial nephritis, which is inflammation of the connective tissue inside the glomerulus, can be a side effect of anti-inflammatory medications or antibiotics.

Thrombosis and vasculitis, two blood-related lupus symptoms, can damage the kidneys and may even cause kidney failure.

Lupus cystitis, which is inflammation of the lining of the bladder, may cause frequent urination and is associated with abdominal discomfort, including vomiting and weight loss.

Medications used to treat lupus may cause signs and symptoms of kidney disease that can be confused with lupus nephritis.

All of these complications can be treated, so if you develop any new symptoms, contact your doctor promptly.

Symptoms of Lupus Nephritis

- Sudden and unexplained swelling, especially in the extremities (feet, ankles, legs, fingers, arms) or the eyes
- Blood in the urine
- Elevated blood pressure
- Foamy appearance to the urine
- Increased urination, especially at night

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