lupus FACT SHEET

KIDNEY DISEASE AND LUPUS

Systemic lupus erythematosus (SLE) can cause inflammation in major organs. Many if not most people with lupus have some involvement of the kidneys. Sometimes the kidneys are not affected in a serious way, but "lupus nephritis," a potentially serious complication of lupus, can be very grave and often requires immediate medical treatment to prevent permanent damage.

Lupus nephritis has very few signs or symptoms – it can occur undetected for a long period of time. That is why it is important for people with lupus to have regular medical checkups and urine tests, even if they are feeling well or their lupus has been calm for months or years.

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How Lupus Affect the Kidneys

Your kidneys are two bean-shaped organs located in the middle of your back, below the rib cage, one on each side of your spine. They are each about the size of a fist. The main function of the kidneys is to remove waste products and other toxins from the body. Each kidney has about one million tiny filters, or glomeruli. Each glomerulus is attached to a tubule (this glomerulus-tubule team is called a nephron). Blood is filtered in the glomerulus, and waste and extra water are collected in the tubule, where they become urine. The urine moves from the kidneys to the bladder through tubes called the ureters and is then passed out of the body.

In systemic lupus, the immune system is overactive, producing antibodies to the body's own tissues. The antibodies combine with protein material called 'antigens' to form immune complexes. They can cause inflammation, cell death and scarring in any organ, including the kidneys, where they can get trapped by the kidneys' filtering system.

When the kidneys are inflamed or scarred, their ability to do this job is impaired, and red blood cells or proteins, which are normally kept in the bloodstream by the kidneys, may leak into the urine. Tests may also show that the kidneys have lost some of the ability to remove waste products from the blood, which can become very serious. As blood proteins such as albumin are lost through the urine, their levels may drop in the bloodstream (therefore, serum albumin tests are helpful in diagnosing kidney problems). Albumin helps to regulate the amount of fluid in the body. When there is an insufficient amount of albumin, fluid can build up in the face, hands, feet or ankles and cause swelling or puffiness (edema) that may get worse as the day progresses.

Symptoms of Kidney Involvement in Lupus

There is usually no pain associated with kidney disease, although some patients may notice swelling in their ankles. Most often, the only indication of kidney disease is an abnormal urine or blood test, so it is important to do these tests regularly, even if you are feeling well. Warning signs include:

- large amounts of protein in the urine (proteinuria, which may cause urine to look foamy); getting up to urinate during the night

can be a sign of excessive protein loss
- the presence of casts in the urine (blood cells that may collect in the kidney to form and be excreted in the urine); they can be seen under a microscope
- red blood cells in the urine (hematuria, which may give urine a pink or cola-coloured tint)
- white blood cells in the urine (leukocyturia)
- low blood protein (hypoproteinemia)
- edema (swelling in parts of the body, such as hands and ankles and around the eyes)

Signs or symptoms of kidney disease that can be confused with lupus nephritis may be caused by some of the drugs used to treat lupus. These problems usually stop when the medications are discontinued. Two medications that can cause fluid retention or loss of kidney function are salicylate compounds (for example, aspirin) and non-steroidal anti-inflammatory drugs (NSAIDs).

If your doctor suspects your kidneys are damaged, he or she may order an ultrasound or biopsy to find out the extent of the damage.

Diagnosing Kidney Disease

Urinalysis can estimate how much damage or activity there is in the kidneys by indicating levels of protein and red blood cells. A more accurate test of protein loss and kidney function is the 24-hour urine collection. As the name suggests, the patient collects all urine passed over a 24-hour period in a special container. The urine is analyzed to determine if the kidneys are filtering properly and how much protein is being lost.

Blood tests determine if the kidneys are filtering properly by measuring the levels of waste products. The serum creatinine test checks for creatinine, which is a byproduct of muscle protein metabolism. Other blood tests may help your doctor make a diagnosis. Two commonly used tests are the serum complement test, which measures the levels of proteins in the blood that are typically low in certain types of active lupus, and an anti-double-stranded DNA (also called anti-DNA) test, which measures antibodies that sometimes indicate active lupus.

If your doctor suspects your kidneys are damaged, he or she may order an ultrasound or biopsy to find out the extent of the damage. A kidney biopsy is also useful to assess the extent and type of lupus nephritis. In a kidney biopsy, a needle is used to extract tiny samples of tissue, which are then examined under a microscope. A biopsy can provide information to confirm kidney disease, determine whether inflammation or scarring has occurred, and identify the cause.

Treatment for Lupus Nephritis

The course of treatment depends on the degree of damage to the kidneys.

In mild cases, treatment may be the same as it is for lupus patients who do not have kidney disease. In severe cases, your doctor may take a more aggressive approach using corticosteroids and/or other immunosuppressive drugs.

There are two major forms of drug therapy used for lupus nephritis: high doses of corticosteroids (such as prednisone) taken orally or intravenously to control inflammation; and "steroid-sparing" drugs to suppress the activity of the immune system long-term (see Fact Sheet related to lupus medications). Corticosteroids and steroid-sparing drugs combat the hyperactivity of the immune system, to prevent more damage to the kidneys.

Your doctor will aim for optimal control of kidney disease with a variety of medications

The most commonly used steroid-sparing drugs in lupus nephritis include cyclophosphamide (Cytoxan), mycophenolate mofetil (Cellcept) and azathioprine (Imuran). Cyclophosphamide has historically been the standard treatment for the most severe forms of lupus nephritis, and is a very usefeul treatment but has several potential negative side effects (see Fact Sheet related to lupus medications). In fact, all drugs have potential side-effects. Thus, your doctors will aim for optimal control of kidney disease with a variety of medications and dosages that may vary over time, in an effort to limit side effects while maximizing benefits.

If the blood pressure is high, medication to treat this (anti-hypertensives) may also be prescribed. Two very important types of medications for people with active kidney disease are "angiotensin converting enzyme (ACE) inhibitors" (for example Monopril, Lisinopril, etc.) and "angiotensin receptor blockers" (ARBs), such as Cozaar™. Diuretic agents may be used to relieve swelling due to excess fluid in the body, and your doctor may recommend dietary changes including reduced salt intake, and possibly restricted intake of water and potassium (found in many foods, especially certain fruits and vegetables).

If the damage is severe and the kidneys fail, dialysis or a kidney transplant may be necessary.

Over the past few decades, we have learned a lot about lupus nephritis and treatment has improved. It is hoped that with additional research, fewer and fewer lupus patients will suffer kidney damage.

Systemic Lupus Erythematosus is an autoimmune disease that affects thousands of Canadians, mostly women in their childbearing years. Symptoms vary greatly from patient to patient and treatment is highly individualized. Patients are urged to contact their physician or health professional with any questions or concerns they might have. For more resources and information about lupus, visit the Lupus Canada website at www.lupuscanada.org

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