



Lupus and the Cardiopulmonary 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 heart, blood vessels, and lungs make up your cardiovascular/pulmonary network: "cardio" refers to the heart, "vascular" refers to the arteries, veins, and capillaries, and "pulmonary" refers to the lungs. Your blood circulates through this vast system, transporting oxygen and other elements needed for your cells and tissues to function properly. Cardiologists are the physicians who specialize in the heart. Pulmonologists are the physicians who specialize in the lungs.

The Heart

Heart disease is a major complication of lupus and is now a leading cause of death among people with lupus.

Pericarditis

The most common way that lupus affects the heart is through inflammation of the pericardium, the sac that surrounds your heart. The symptoms of pericarditis that you may experience are sharp pain in your chest, and occasionally, shortness of breath. Pericarditis usually does not damage your heart's ability to function because it does not directly involve the heart tissue. However, inflammation that is chronic (long-lasting) can scar heart tissue, which can interfere with the heart's ability to pump blood.

Myocarditis

Lupus can cause inflammation of the myocardium, the muscle tissue of your heart. The symptoms are chest pain and an unexplained rapid or irregular heart beat. Myocarditis is often seen when there is inflammation in other muscles in the body.

However, myocarditis can be caused by viral, bacterial, and fungal infections. Because lupus itself creates an added risk for developing infections-especially if you are taking certain immunosuppressive drugs, you are at increased risk for this type of myocarditis.

Though serious heart muscle disease is not commonly caused by lupus, heart failure can occur if your heart does not have the strength to pump enough blood to the different tissues and organs.

Endocarditis

The endocardium is the tissue that lines the inner walls of your heart and the valves that separate the heart's different chambers. Lupus can cause inflammation of the endocardium. Lupus endocarditis usually causes the surfaces of the heart valve to thicken or develop wart-like growths (lesions). These lesions can become infected, a condition called bacterial endocarditis. A lesion also could break off and travel to the brain to form a blood clot. Both of these possibilities are potentially very dangerous.

Coronary Artery Disease

The coronary arteries move blood to and from your heart. Over time, fatty molecules and other materials may attach to the walls of these blood vessels and form plaque, which makes the blood vessels narrower and restricts blood flow. This condition is known as atherosclerosis. A decrease in blood flow can cause angina (chest pain). However, if the blood flow to your heart is interrupted-either by plaque or by a blood clot that develops when plaque breaks off-you could be at risk for a heart attack.

When you have lupus you are at increased risk for coronary artery disease. This is partly because people with lupus have more risk factors, which may include:

- *hypertension from kidney disease or corticosteroid use*
- *elevated cholesterol levels from corticosteroid use*
- *type 2 diabetes from corticosteroid use*
- *an inactive, sedentary lifestyle due to fatigue, joint problems, and/or muscle pain*

However, even after taking these risk factors into account, people with lupus are more likely to develop atherosclerosis. You can help reduce your chances of heart attacks and other complications from coronary artery disease in several ways:

- *control risk factors*
- *control the lupus disease activity*
- *talk to your doctor about reducing or stopping your corticosteroid use*

Blood

Blood is made up of many different parts, but those that are most often affected by lupus are the red blood cells, the white blood cells, and the platelets.

Anemia

Anemia occurs when not enough oxygen is transported to the tissues in your body. There are several possible causes for this:

- *too few red blood cells*
- *not enough hemoglobin*
- *not enough blood circulating in the body*

In most cases, lupus-related anemia occurs because your body is not producing enough red blood cells. However, sometimes antibodies target red blood cells for destruction. This condition is called hemolytic anemia, or simply hemolysis. Hemolysis can cause a yellowish color in your skin and eyes and is a serious condition.

Anemia may also be caused by aspirin, ibuprofen, and other non-steroidal anti-inflammatory drugs (NSAIDs) used to treat lupus. These drugs can irritate the lining of your stomach, which may lead to bleeding and loss of red blood cells. Feeling very tired is the earliest and most common symptom of anemia.

Leukopenia and Neutropenia

If you have too few white blood cells in your body you may develop leukopenia and/or neutropenia (also called granulocytopenia). Both are common in people with active lupus. Low numbers of white blood cells may be due to an infection in your body, or due to certain drugs used to control lupus that work by suppressing your immune system.

Thrombocytopenia

If you have low platelet numbers you may develop thrombocytopenia. This condition is almost always caused by antibodies that attack and destroy healthy platelets. The symptoms of a low platelet count are bruising, nosebleeds, or the appearance of tiny red bleeding points called petechiae (pronounced pah-TEE-kee-eye) in your skin (especially on your lower legs). Although thrombocytopenia is common in lupus, serious bleeding usually does not occur.

Thrombosis

The blood's ability to form clots at the site of wounds is absolutely essential. Sometimes, unnecessary clots form inside the blood vessels and prevent the blood from circulating, a condition called thrombosis. If a thrombus, or blood clot, breaks off and travels through your blood, it is called an embolus or embolism.

Thrombosis is a serious and frequent complication of lupus. A clot in the veins of the lower leg can make walking painful and difficult, and may also produce an embolism that travels up into another part of your body. A clot in the lungs can cause high blood pressure (hypertension). A clot in a blood vessel of the brain can cause a stroke. During pregnancy, blood clots can lodge in the placenta and disrupt nutrition to the fetus.

Most blood clots in lupus are associated with antibodies in the blood to substances called phospholipids. People with lupus who have antiphospholipid antibodies are much more likely to have blood clotting problems.

The Circulatory System

Inflammation in a small blood vessel like a capillary may cause that vessel to break and bleed inside the tissue. Inflammation that occurs in the skin may appear as a small red or purple dot. Inflammation that takes place in other tissues can be extremely serious, especially within the brain. Vasculitis is caused by inflammation of the blood vessel walls. The symptoms of lupus-induced vasculitis that you may experience can vary depending upon which tissues are involved, but may include:

- *fever*
- *poor appetite*
- *headache*
- *seizures*
- *behavioral disturbances*
- *feeling ill*
- *weight loss*
- *blurry vision*
- *strokes*

The Lungs and Pulmonary System

Inflammation caused by lupus may affect the lungs in many ways.

Pleuritis

The most common way that lupus can affect your lungs is through inflammation of the pleura, the lining that covers the outside of the lungs. The symptom of pleuritis that you may experience is severe, often sharp, stabbing pain in specific areas of your chest.

The pain, which is called pleurisy, is made worse when you take a deep breath, cough, sneeze, or laugh. You may also experience shortness of breath. Sometimes an abnormal amount of fluid will build up in the space between your lungs and your chest wall; when it leaks out it is called a pleural effusion. Pain from pleurisy, with or without effusions, is found in 40 to 60 percent of people with lupus.

Pneumonitis

The term for inflammation within the lung tissue is pneumonitis. The symptoms of pneumonitis that you may experience are fever, chest pain, shortness of breath, and cough. An infection caused by bacteria, virus, or fungi is the most common cause of pneumonitis.

Chronic Diffuse Interstitial Lung Disease

When inflammation in the lungs is chronic, it can cause scarring. This scar tissue can prevent oxygen from moving easily from your lungs into your blood and may cause diffuse (widespread) interstitial lung disease. The symptoms that you may experience include a chronic dry cough, chest pain, and difficulty breathing during physical activity.

Pulmonary Emboli

Blood clots that block the arteries leading to the lungs are called pulmonary emboli. These blood clots will cause chest pain and shortness of breath, but can also lead to a decrease in oxygen flow in your lungs. You are at increased risk for pulmonary emboli if you have antiphospholipid antibodies, vascular damage, and/or an inactive lifestyle.

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