



## Autoimmune Diseases (lupus Erythematosus)

<b>Reyim Mahdi Abdel Kazem</b>	Sumer University - College of Science Department of pathological Analyzes/ <a href="mailto:riammahdiabedN@uos.edu.iq">riammahdiabedN@uos.edu.iq</a>
<b>Azhaar Abd Alzhraa khlewi Abadi</b>	University of kerbalaa College of Medical Applied Science Department of pathological Analyzes/ <a href="mailto:mrafd9527@gmail.com">mrafd9527@gmail.com</a>
<b>Sajad mohammed Razzaq Hashem</b>	University of Kufa College of Science Department of Pathological Analysis <a href="mailto:mtnwhakhbar793@gmail.com">mtnwhakhbar793@gmail.com</a>
<b>Aba Hassan Ali Hassan Saleh</b>	University of Kufa College of Science Department of Pathological Analysis <a href="mailto:lyhsn8159@gmail.com">lyhsn8159@gmail.com</a>
<b>Sajjad Mohammed nassir Hussain</b>	University of Kufa College of Science Department of Pathological Analysis <a href="mailto:Gggddg9@gmail.com">Gggddg9@gmail.com</a>

### ABSTRACT

Lupus erythematosus is an autoimmune disease, which means that the immune system erroneously acts against its own healthy tissues. It usually follows a chronic course and hence can also be termed as a chronic disease. It may involve only a single organ, but in its due course, it usually involves multiple organs of the body. There are various types of rashes in systemic lupus erythematosus (SLE), the butterfly-like rash being the most famous. Up to now, many classifications of lupus have been given, but the classification into the discoid lupus and the disseminated lupus is being most widely accepted. From the time of Hippocrates, it was assumed to be present, and after many research studies, it is still a dreaded disease. Females are more affected than males by this disease. In the past, the survival rate of SLE was very poor. Now the survival rate has increased, thanks to the newer drugs and other strategies taken against this disease. The main causes of death from SLE were renal disease, neoplasm, CVD, cerebrovascular disease, respiratory disease and infection. It has been found that various genes cause the disease. In a small fraction of patients, the disease may be attributed to a single gene. But majority of the patients with this disease have multiple genes ..

**Keywords:**

Lupus erythematosus , autoimmune disease

**Introduction** Hippocrates (460–375 bc) was the first to describe cutaneous ulcers under the heading of herpes esthiomenos. From what we can tell, Herbernus of Tours was the first to apply the term lupus to a skin disease in 916 ad. Following this, a number of terms including lupus, noli me tangere, and herpes esthiomenos were used to describe cutaneous ulcers. Willan (1757–1812) expanded the classification of skin diseases using the term herpes for vesicular diseases and lupus for destructive and ulcerative diseases of the face. The first clear description of lupus erythematosus was by Bielt and was reported by his student Cazenave under the term erythema centrifugum in 1833. In 1846 Hebra, under the name of Seborrhea Congestiva described disc-shaped patches and introduced the butterfly simile for the malar rash. In 1851 Cazenave renamed erythema centrifugum, calling it lupus erythematosus and gave a classic description of discoid lupus erythematosus. In 1872 Kaposi subdivided lupus into the discoid and systemic forms and introduced the concept of systemic disease with a potentially fatal outcome. Hutchinson alluded to the photosensitive nature of the rash and may have provided the earliest description of what is now called annular subacute cutaneous lupus. In 1894 Payne used quinine in the treatment of patients with LE and postulated the presence of a vascular disturbance. In 1902, Sequira and Balean published a large series of patients with discoid and systemic LE and provided clinical and pathologic details of a young woman who died of glomerulonephritis. In 1904, Jadassohn published an exhaustive review of discoid and systemic LE, including clinical features and pathologic findings. Between 1895 and 1904 Sir William Osler published 29 cases of what was termed the erythema group of diseases. Perhaps his major contribution was to show that skin diseases could be accompanied by a

variety of systemic manifestations. In retrospect most of his patients suffered from diseases other than SLE and it was only in his 1904 paper that two cases with SLE were described. He did not acknowledge this diagnosis in his cases and we share the viewpoint that his contribution to the study of SLE has been overemphasized<sup>[1]</sup> Now, the origin of this disease is understandable clearly. It is conjectured that hormonal, environmental, genes, genetic variation and heredity play a significant role in its development<sup>[2]</sup>. It has been seen that if one member of a twin is affected the chances that the other twin may also be affected is 24%.

Documented proof of lupus can be tracked down to the time of the ancient Greek physician Hippocrates. In the year 400 BC, he wrote about herpes esthiomenos<sup>[3]</sup>, which is conjectured to be lupus only. It has been seen that Hippocrates mentioned about red, circumscribed inflammatory and often suppurating lesion on the skin or an internal mucous surface resulting in necrosis of tissue, which may depict present day lupus. It has also been documented that there was a saint named Lupus, who lived in the sixth century A.D.<sup>[4]</sup>

The history can be traced back into three parts as follows:

- (1) The traditional or classical phase during which the skin disarray was narrated.
- (2) The conventional period during which the entire body symptoms and signs of lupus were found out after careful searching unearthed and organised in a systematic way. Definition of lupus

Systemic lupus erythematosus (SLE), which is simply known as lupus, is an autoimmune disease in which the immune system of the body erroneously onslaughts tissues in various parts of the body which are healthy [6-7]. It may show only single organ sign or multiple system sign at the onset. It can affect the brain, skin, joints and other parts of the body. It is an autoimmune problem that has a wide-ranging clinical presentation, encircling various parts of the body. Figure (1-2)



**Figure 1:** The butterfly rash of lupus. It is a type of condition of the skin, which is denoted by the appearance of spots/ skin eruptions over the cheekbones and also over the bridge of the nose.

### 1.1. Literatures Review (lupus erythematosus)

lupus as a complex nature, with heterogeneous clinical presentation and disease course, involving one or multiple organs at a time. Organ involvement may vary widely between patients and within the same patient over time, with fluctuating levels of disease activity. Therefore, the development of a comprehensive, accurate, reliable, user-friendly, and sensitive-to-change SLE disease activity outcome measure is a main challenge [19,20]. Furthermore, there are no accurate biomarkers to measure SLE disease activity, to predict its response to drugs and estimate patients' prognosis [19,20].

The types of lupus can occur on any part of the body, the most common and most serious type is Systemic lupus erythematosus (SLE)

No two cases of lupus are exactly alike. Signs (symptoms) may come on suddenly or develop slowly. Also, symptoms change over time. If you have lupus, you may experience periods of illness (flares) and periods of wellness (remission). Lupus flares can be mild to serious, and they are unpredictable. However, with treatment, many people with lupus can manage the disease.

Most people with lupus have mild disease with this outbreaks (flares) when signs get worse for a while, then get better or even disappear for a while. During a flare, The person feels much more tired, sick, feverish, and achy. A flare can also harm important body organs. Part of managing lupus is preventing flares. These can often follow times of physical or emotional stress.

The symptoms of lupus vary from person to person and can range from mild to severe.

In this chapter, we will discuss the possible causes of lupus, the types of lupus, and the symptoms associated with each type.

### 1.2. CAUSES AND RISK FACTORS:

The cause of lupus erythematosus has not yet been determined, and the prevailing scientific belief is that there are genetic and environmental factors involved in being the cause of this disease. In lupus, the immune system loses its ability to recognize foreign substances and its own cells and tissues. Lupus occurs within the same family, but this cannot be proven by the existence of genes believed to cause the disease. Some recent discoveries indicate that genes on chromosome 1 are associated with lupus erythematosus in some families.

It may be a combination of many underlying factors. These include:

1. Environment. A triggers like smoking, stress, ultraviolet rays, viruses, physical or emotional stress, trauma and exposure to toxins like silica dust as potential lupus causes.
2. Genetics. According to the Lupus Foundation of America, more than 50 genes associated with lupus have been identified. Additionally, having a family history of lupus may put a person at slightly higher risk for experiencing the condition.
3. Hormones. An atypical hormone levels, such as increased estrogen levels, could contribute to lupus.
4. Infections. Experts are still studying the link between lupus and infections like cytomegalovirus and Epstein-Barr.
5. Medications. Long-term use of certain medications, such as hydralazine (Apresoline), procainamide (Procanbid), and quinidine, has been linked with Drug Induced Lupus (DIL.)

Also, people taking TNF blockeryy medications for conditions such as rheumatoid arthritis (RA), inflammatory bowel disease, and ankylosing spondylitis can develop DIL. Though rare, tetracyclines, like minocycline, which can be used to treat acne and rosacea, can cause DIL as well.<sup>[8]</sup>

Certain groups may be at a higher risk of developing lupus. Examples of risk factors for lupus include:

1. Gender. Women are more likely to develop lupus than men, but the disease can present as more severe in men.
2. Age. While lupus can occur at any age, it's most often diagnosed in people between the ages of 15 and 44.
3. Family history. Having a family history of lupus means that you're at a greater risk of developing the condition.
4. Ethnicity. In the United States, Lupus is more common in People of Color, Black People, Hispanic People, Latino People, Asian People, Native Americans, Native Hawaiians, and Pacific Islanders, than in Caucasian people. Lupus can develop earlier in age and be more severe in the above groups of people. Research Trusted Source from 2014 shows that 1 in 537 Black females in America are affected by Lupus. Researchers Trusted Source are

not completely certain if this is due to genetic or socioeconomic factors (or both).

\*Remember that having risk factors for lupus doesn't mean you'll get lupus. It just means that you're at increased risk compared to those who don't have risk factors.<sup>[9]</sup>Types of Lupus:

Healthcare professionals usually categorize four lupus types.

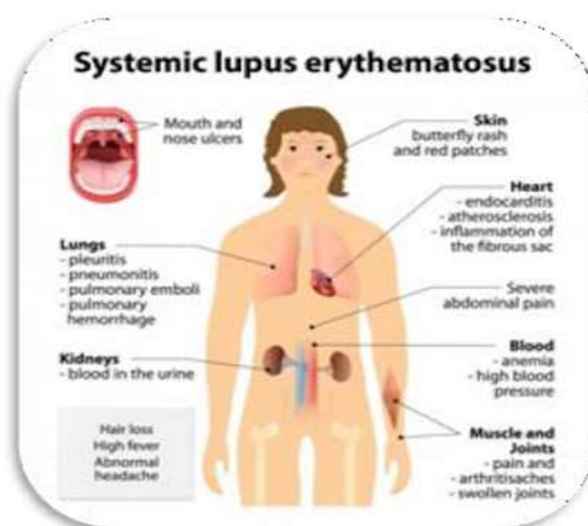
### 1.2.1. Systemic lupus erythematosus

Systemic lupus erythematosus (SLE) is the most common type of lupus. When you hear someone say that they have lupus, it's likely they're referring to SLE.

SLE gets its name from the fact that it typically affects several different organ systems of your body. ResearchTrusted Source shows that these include the:

- kidneys
- skin
- joints
- heart
- nervous system
- lungs

SLE can range from mild to severe. The condition causes symptoms that may get worse over time and then improve. According to the Lupus Foundation of America, the times when your symptoms get worse are called flares. The periods when they improve or go away are known as remissions.<sup>[10]</sup>



**Figure (3) : Common type of Lupus: Systemic Lupus Erythematosus (SLE)**

### 1.2.2. Cutaneous lupus

This type of lupus is generally limited to your skin. It may cause rashes and permanent lesions with scarring. There are several different types of cutaneous lupus, including :

- Acute cutaneous lupus. This type causes a characteristic “butterfly rash” to occur. This is a red rash that appears on the cheeks and nose.
- Subacute cutaneous lupus. This kind of cutaneous lupus causes a rash that’s

red, raised, and scaly to form on the body. It's often on areas that have been exposed to sunlight and typically doesn't lead to scarring.

- Chronic cutaneous lupus. This type causes a purple or red rash. It can also cause skin discoloration, scarring, and hair loss. You may also see it called discoid lupus.

While acute cutaneous lupus is often associated with lupus in other parts of the body, subacute and chronic cutaneous lupus typically only occur on the skin.<sup>[11]</sup>

### 1.2.3. Neonatal lupus

This condition is extremely rare and affects infants whose birthing parents have certain autoimmune antibodies. These autoimmune antibodies are transmitted from parent to fetus across the placenta.

Not all parents who have these antibodies have symptoms of lupus. In fact, research shows that about 25 percent Trusted Source of mothers who give birth to a child with neonatal lupus don't have lupus symptoms. However, it's estimated that 50 percent Trusted Source of these mothers will show symptoms within 3 years.

Symptoms of this condition may include:

- a skin rash
- low blood cell count
- liver problems after birth
- While some babies may have developmental issues in the heart, most have symptoms that will go away after several months.<sup>[12]</sup>

### 1.2.4. Drug-induced lupus

The use of certain prescription medications can lead to drug-induced lupus (DIL). DIL may also be referred to as drug-induced lupus erythematosus (DILE).

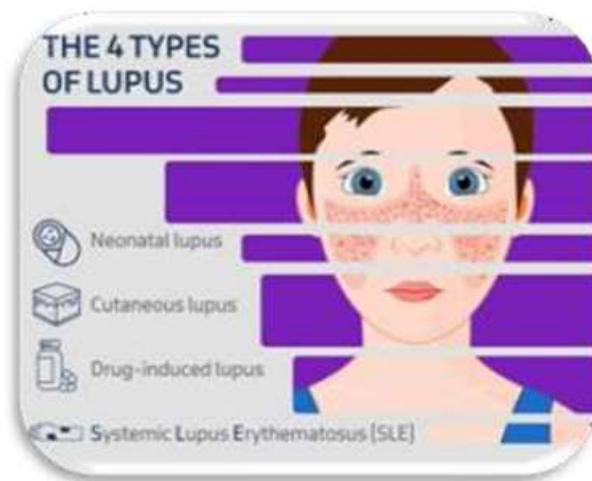
Research Trusted Source shows that DIL can develop through the long-term use of certain prescribed medications. It typically occurs after just months of taking a drug. Many drugs can cause you to develop DIL. Some examples include:

- antimicrobials, such as terbinafine (an antifungal) and pyrazinamide (a tuberculosis medication)
- anticonvulsant drugs, like phenytoin (Dilantin) and valproate



- arrhythmia drugs, such as quinidine and procainamide
- drugs for high blood pressure, like hydralazine
- biologics called anti-TNF-alpha agents, such as infliximab (Remicade) and etanercept (Enbrel)

While DIL mimics the symptoms of SLE, in most cases the condition doesn't usually affect major organs. However, it can cause pericarditis and pleurisy. DIL usually goes away within weeks of stopping the medication that caused it to occur.



*Figure (4) : Types Of Lupus*

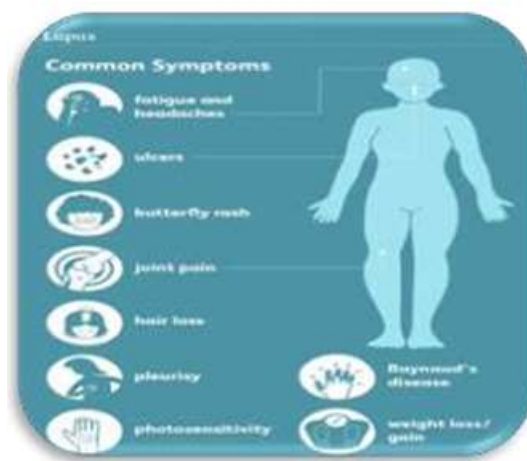
### 1.3. SYMPTOMS:

Lupus can affect almost any organ in the body. Symptoms can vary, depending on the individual. They may:

- be permanent
- disappear suddenly
- flare up occasionally.

For example, one person with lupus may have swollen knees and fever. Another person may be tired all the time or have kidney trouble. Someone else may have rashes. Over time, new symptoms can develop or some symptoms may happen less often.

Lupus symptoms also usually come and go, meaning that you don't have them all of the time. Lupus is a disease of flares (the symptoms worsen and you feel ill) and remissions (the symptoms improve and you feel better).



**Figure (5) :**

**Common Symptoms of Lupus**

Lupus symptoms include:<sup>[13,14]</sup>

Muscle and joint pain. You may experience pain and stiffness, with or without swelling. This affects most people with lupus. Common areas for Lupus can affect almost any organ in your body. The symptoms of lupus also differ from person to person. For example, one person with lupus may have swollen knees and fever. Another person may be tired all the time or have kidney trouble. Someone else may have rashes. Over time, new symptoms can develop or some symptoms may happen less often.

Lupus symptoms also usually come and go, meaning that you don't have them all of the time. Lupus is a disease of flares (the symptoms worsen and you feel ill) and remissions (the symptoms improve and you feel better) muscle pain and swelling include the neck, thighs, shoulders, and upper arms.

1. **Fever.** A fever higher than 100 degrees Fahrenheit affects many people with lupus. The fever is often caused by inflammation or infection. Lupus medicine can help manage and prevent fever.
2. **Rashes.** You may get rashes on any part of your body that is exposed to the sun, such as your face, arms, and hands. One common sign of lupus is a red, butterfly-shaped rash across the nose and cheeks.
3. **Chest pain.** Lupus can trigger inflammation in the lining of the lungs. This causes chest pain when breathing deeply.
4. **Hair loss.** Patchy or bald spots are common. Hair loss could also be caused by some medicines or infection.
5. **Sun or light sensitivity.** Most people with lupus are sensitive to light, a condition called photosensitivity. Exposure to light can cause rashes, fever, fatigue, or joint pain in some people with lupus.
6. **Kidney problems.** Half of people with lupus also have kidney problems, called lupus nephritis.<sup>[15]</sup> Symptoms include weight gain, swollen ankles, high blood pressure, and decreased kidney function.
7. **Mouth sores.** Also called ulcers, these sores usually appear on the roof of the mouth, but can also appear in the gums, inside the cheeks, and on the lips. They may be painless, or you may have soreness or dry mouth.
8. **Prolonged or extreme fatigue.** You may feel tired or exhausted even when you get enough sleep. Fatigue can also be a warning sign of a lupus flare.
9. **Anemia.** Fatigue could be a sign of anemia, a condition that happens when your body does not have red blood cells to carry oxygen throughout your body.
10. **Memory problems.** Some people with lupus report problems with forgetfulness or confusion.
11. **Blood clotting.** You may have a higher risk of blood clotting. This can cause blood clots in the legs or lungs, stroke, heart attack, or repeated

miscarriages.

12. **Eye disease.** You may get dry eyes, eye inflammation, and eyelid rashes.

1.4. Rash

Skin rashes are a common symptom of lupus that many people experience. Rash typically occurs after sun exposure. It often presents as a butterfly-shaped rash on the cheeks and bridge of the nose.<sup>[17]</sup>

Skin rashes may also appear as patches or ring-shaped lesions on the:

- arms
- legs, upper back
- chest
- neck
- scalp
- face
- shoulders

These rashes may be raised, smooth, or scaly and can be painful or itchy in some cases. The rashes usually also appear red or purple and may be more noticeable in people with darker skin tones<sup>[18]</sup>

Systemic lupus erythematosus (SLE) is a systemic disease with a variety of presenting manifestations such as fever, arthralgias, malar rash, hematuria, and oral ulceration. People who have lupus may develop problems with different organs and systems of the body. In lupus, the body's immune system does not work as it should. Every healthy person has a healthy immune system that produces antibodies and certain cells that help fight infections. Destroying viruses, bacteria and other foreign substances that invade the body while an infected person has it. In lupus, the immune system produces antibodies against healthy cells and tissues in the body. This causes inflammation of various parts of the body and possibly damage to organs and tissues.

Diagnosing lupus is difficult because signs and symptoms vary considerably from person to person. Signs and symptoms of lupus may change over time and overlap with those of many other disorders. No one test can diagnose lupus. The combination of blood and urine tests, signs and symptoms, and physical examination findings leads to the diagnosis.

While for the treatment of lupus depends on signs and symptoms. Determining whether the patient should be treated and what medications to use requires a careful discussion of the benefits and risks with the doctor. As the signs and symptoms flare and subside, the patient and the doctor may find that he will need to change medications or dosages.

Some people are born with a tendency toward developing lupus, which may be triggered by infections, certain drugs or even sunlight. While there's no cure for lupus, treatments can help control symptoms.

### 3.1. Conclusions :

1. Lupus is a multifactorial autoimmune disease that can affect nearly every organ in the body.
2. Lupus predominantly affects younger women, but can occur in up to 20% of patients 50 years of age or older.
3. The diagnosis of Lupus is based on criteria set by the American College of Rheumatology.
4. Lupus symptoms can show up in many different ways and are often mistaken for symptoms of other diseases , This is why it can be

hard to diagnose and is often called “the great imitator.” Lupus symptoms can range from mild to life threatening.

5. Researchers have found that cigarette smoke, alcohol, and some work-related and other chemicals appear to trigger genetic changes that can lead to lupus.
6. Corticosteroids (prednisone) may help reduce swelling, tenderness, and pain. In high doses, they can calm the immune system.
7. Reduce your sun exposure by staying out of the sun as much as possible, wearing clothes that cover your skin and using sunscreen of SPF 100.
8. There is some evidence to suggest that people with lupus may benefit from vitamin D supplements, and calcium supplements can also help get the recommended daily allowance of 1,000 milligrams to 1,200 milligrams, depending on the age, to maintain the bones health.

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