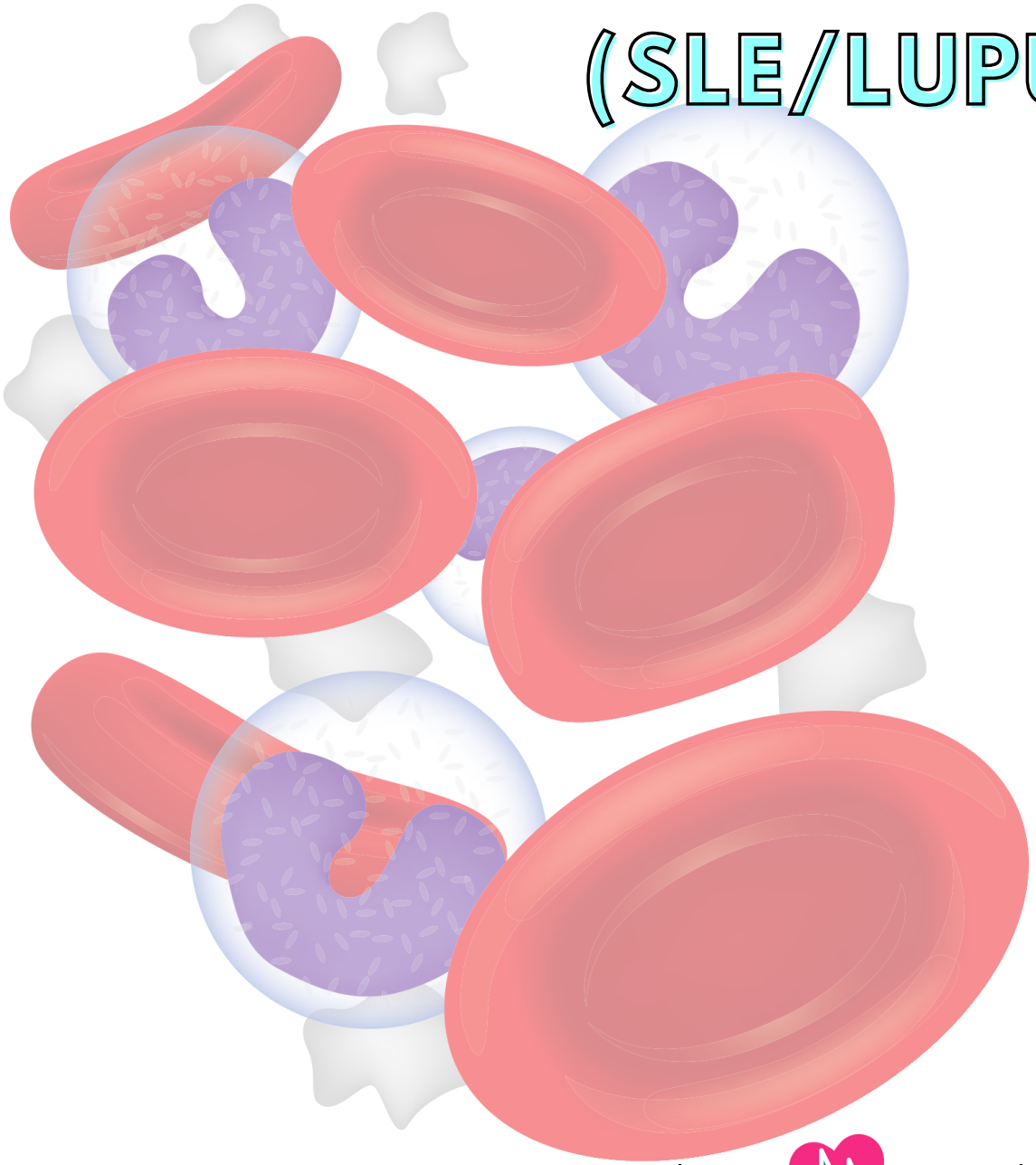
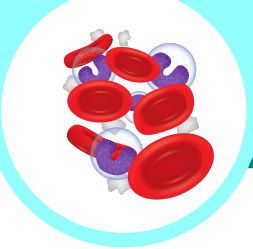
STUDY GUIDE

SYSTEMIC LUPUS ERYTHEMATOSUS (SLE/LUPUS)



Immunology NursingSOS



SYSTEMIC LUPUS ERYTHEMATOSUS (SLE/LUPUS)

STUDY GUIDE

DEFINITION

Systemic Lupus Erythematosus, or SLE or Lupus, is an autoimmune disorder, meaning that the patient's own immune system is attacking the normal and healthy body tissues. This leads to a lot of inflammation throughout different body systems. It can even lead to the destruction of red and white blood cells, platelets, and phospholipids.

POSSIBLE CAUSES

It's thought to be caused by a mix of genetics and the following environmental factors:

- Sunlight/UV rays
- Estrogen
- Certain medications
- Certain infections

PATHOPHYSIOLOGY

Step 1: The Immune System is Triggered

When someone has a genetic predisposition to developing SLE/Lupus and encounters certain environmental factors, there can be an increased risk of their immune system being triggered and them developing SLE/Lupus.

Step 2: The immune System Attacks Normal Cells

After the immune system is triggered, it starts recognizing normal body tissues as foreign and starts attacking them.

Step 3: Antibodies are Made & Attack the Cells

B-cells come in and try to help in the attack, making antibodies AGAINST those normal body tissues. So the immune system is really trying to be helpful, but is attacking the normal and healthy body tissues rather than a foreign invader or pathogen.

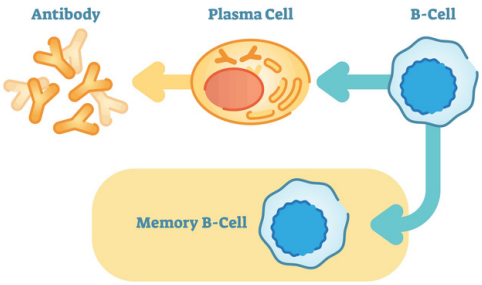


Image of Antibodies being made
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Step 4: Antigen-Antibody Complexes are Made

As more and more of the antibodies attack the cells, they create larger antigen-antibody complexes. These are basically balls of antibodies and dead cell parts all stuck together.

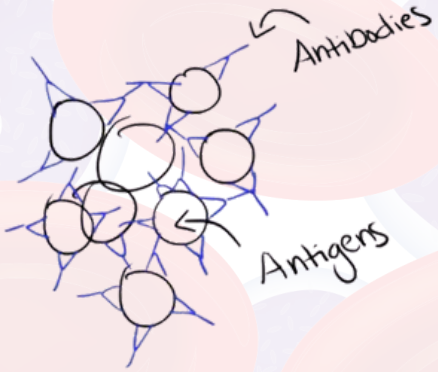

Image of Antigen-Antibody Complexes

Step 5: Inflammation

Since these complexes are fairly large, they can get stuck throughout the body, especially in the joints, kidneys, and skin. When they get stuck in an area of the body, they trigger the inflammatory response and cause a lot of inflammation in that area.

Step 6: The Immune System Attacks Red & White Blood Cells, Platelets, & Phospholipids

Another thing that can happen is that the immune system can start attacking red and white blood cells, platelets, and phospholipids. Phospholipids make up cell membranes, or basically the whole outside of all your cells.

This step doesn't always happen in every patient with SLE/Lupus, but it can happen.

SIGNS AND SYMPTOMS

The signs and symptoms of SLE/Lupus are related to the inflammation that occurs when the immune system attacks healthy body tissues and when those antigen-antibody complexes are lodged in the different body tissues.

This inflammation can happen anywhere in the body and can affect many different body systems; the symptoms are primarily based on what body system is being affected. And since every person reacts to inflammation differently, the symptoms don't always present the same for every patient; some may come on suddenly while others it may take years to develop.

These symptoms are related to the antigen-antibody complexes that form from the immune system attacking normal cells. This leads to an exaggerated and localized inflammatory process. Since the complexes can lodge themselves anywhere in the body the symptoms can vary greatly.

Butterfly Rash (Malar Rash)

The hallmark symptom of SLE/Lupus is a butterfly patterned red rash to the cheeks and bridge of the nose, called a malar rash or butterfly rash. This is due to inflammation of the tissue as antigen-antibody complexes get caught in the blood vessels near the skin. Direct sunlight will also irritate the tissue even further.

Patients with SLE/Lupus may be very sensitive to sunlight and one of the triggers of this disorder, along with genetics, seems to be UV rays and sunlight. So those UV rays can further irritate the skin and cause more inflammation.

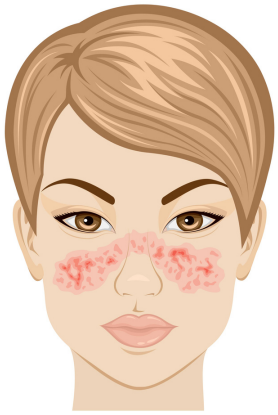

Image of Butterfly Rash
scio21 / stock.adobe.com

Swollen/Stiff Joints & Joint Pain

Swollen and stiff joints can occur as antigen-antibody complexes are lodged inside of them; this can cause inflammation as well. This swelling can cause pain and may be worse at the end of the day or with exertion.

Extreme Fatigue & Low Red Blood Cell (RBC)/White Blood Cell (WBC)/Platelet Count

Extreme, unexplained fatigue is another symptom, since the body is working overtime with the overactive immune system. This fatigue may also be caused by destruction of red blood cells and phospholipids, leading to cell death. The body's immune system is attacking the cells in the body, so you might see their red and white blood cell and platelet counts decreased.

Unexplained Fever

The patient may also have an unexplained fever that does not have any other infectious symptoms. This is the body's reaction to that inflammatory response; the body thinks there's a foreign invader and raises the body temperature to try and kill the pathogen. Unfortunately, the inflammatory response is just because of the overactive immune system that's attacking healthy body cells. So the patient may have a fever but no other symptoms of infection, since there is no pathogen.

Raynaud's Phenomenon

Raynaud's phenomenon may also occur, which is when the fingers and toes turn white or blue, go numb, and not have any blood in them; this occurs especially with stressful situations or in the cold.

Image of Raynaud's Phenomenon

Chest Pain or Shortness of Breath

Since SLE/Lupus can cause inflammation anywhere, chest pain or shortness of breath can be a symptom if the lung tissue is inflamed.

Hair Loss

The patient may also have hair loss if the inflammatory process happens around the skin and hair follicles.

Neurological Symptoms

Headaches, memory loss, confusion, vision problems, strokes, or seizures can occur if the brain and neurological system have been affected by the inflammation.

Cardiovascular Disease

There is a higher risk of cardiovascular disease as well as heart attacks if the cardiac tissue is involved in the inflammatory process as well.

NURSING ASSESSMENT

The nursing assessment will revolve around assessing the inflammation and extent of the damage, and helping ensure it doesn't get worse.

Pain & Pain Triggers

Since there is so much inflammation happening in the body, it can cause quite a bit of pain. Assess and identify the patient's pain and pain triggers (like overexertion, extreme temperatures, or inactivity). Keep the patient as comfortable as possible and help reduce their pain.

Mucous Membranes, Joints, & Skin

Monitor areas that are affected by the inflammatory process:

- **Mucous membranes**: monitor the mouth for sores and open areas (as this will increase the risk of infection)
- **Joints**: ask if their joints are sore or if they have any difficulty moving them
- **Skin**: look at their skin to assess for a rash

Notice the correlation between your assessment and the symptoms, this will vary based on the individual patient and where the inflammation is at the time.

Any Signs of Infection & Vital Signs

One of the biggest things you'll need to assess for is an infection. Since these patients are immunocompromised because their immune system is overactive and preoccupied attacking the healthy body tissues, it's possible for another infection to creep up and go unnoticed. It's really important to be tracking their vital signs:

- Fever
- Increased heart rate
- Decreased blood pressure
- Chills
- Change in breathing pattern
- Change in lung sounds
- Increased coughing
- Productive cough

These are all signs of a possible infection and should be looked into immediately.

Patients with SLE/Lupus are immunocompromised and are at a higher risk of infection.

Daily Weight

Assess their daily weight, taking it at the same time of day, with the same scale, and with them wearing the same clothes. Ask if they've lost weight either recently or over a more extended period of time; SLE/Lupus can come on suddenly or can be more progressive over time. Since it causes so much fatigue, the patient may not have a lot of energy to eat, leading to weight loss.

Lab Values & Bleeding or Bruising

Monitor their lab values:

- **Erythrocyte Sedimentation Rate (ESR):** measurement of the inflammatory process happening in the body (the higher this value is, the more inflammation there likely is)
- **Red blood cell (RBC), white blood cell (WBC), and platelet count**: since the immune system will also attack the red and white blood cells and platelets and destroy them, these values may be decreased. Also assess for bleeding and bruising since their blood won't be able to clot as well with a decreased platelet count.

- **AST, ALT, ALP, Creatinine, and BUN**: If antigen-antibody complexes become lodged in the kidneys and liver and cause inflammation, they can impair kidney and liver function. Liver labs, like the AST, ALT and ALP, along with renal labs like creatinine and BUN, will help determine if the liver or kidneys have been compromised.
- **Red cell casts and proteins in urine**: If the kidneys become compromised, they may have red cell casts or proteins spilling out into their urine. Red cell casts mean that there is bleeding within the kidneys. As damage continues, larger protein molecules will be able to pass through into the urine, which they aren't usually able to do. Frequent urinalysis should be done to watch for this to catch it early if kidney damage does start to occur.

Kidney function may start to decline in the early stages of SLE/Lupus, but be sure to test their creatinine and BUN lab values to ensure the kidneys aren't compromised.

Medication Side Effects & Intake & Output

Monitor for any signs that the patient is not tolerating their medications well (such as immunosuppressants or steroids); making sure they are taking them correctly and getting lab values drawn as needed will be super important. If the patient is taking corticosteroids, they may retain too much fluid, so you'll need to track their intake and output, as well as their daily weights.

New Inflammation

Monitor areas of new inflammation. Make sure the patient is aware of new symptoms (like new pain, new rashes, and new swelling) and can identify triggers if possible to avoid or prevent worsening. The more they understand their potential triggers, the better equipped they'll be to help control their symptoms.

NURSING INTERVENTIONS

The goal of the nursing interventions is to help reduce the inflammation, control complications, and prevent the inflammation from getting worse.

Pain Management, Warm or Cool Compresses, Range of Motion Activities, & NSAIDs

Assist with pain management and helping the patient identify pain triggers to avoid in order to reduce pain. Encourage them to use warm or cool compresses on their

joints to help relieve pain if they're experiencing joint pain. Active and passive range of motion activities can help strengthen and mobilize the inflamed joints. NSAIDs may also be prescribed to help relieve joint pain and inflammation.

Breathing Exercises & Incentive Spirometer

Deep breathing and breathing exercises will help prevent inflammatory responses in the lungs. Teach the patient how to use an incentive spirometer for lung maintenance to keep their lung tissue healthy and help open up the airways. Since they're already immunocompromised because their immune system is overactive fighting healthy tissues, it might not recognize if a pathogen enters the lungs. So it's important for the patient to keep their lungs as clear as possible, since their immune system might not help as much.

Avoid Sun/UV Exposure

Teach the patient about the importance of avoiding sun exposure. If sun exposure occurs, have them wear SPF in order to minimize the inflammatory response of the tissue. UV and sunlight exposure is a trigger for SLE/Lupus and can lead to more inflammation, so have them avoid harsh sunlight and UV exposure to help reduce symptoms.

Sunlight/UV exposure is a big trigger for SLE/Lupus, and should be avoided as much as possible.

Reposition Every 2 Hours & Provide Good Mouth Care

Help reposition them at least every 2 hours to prevent skin irritation and breakdown, and teach them about the importance of good oral hygiene and oral health maintenance to prevent or treat mouth sores. With all that inflammation happening throughout the body, the mucous membranes may become inflamed as well, leading to mouth sores.

Encourage Rest

Helping the patient rest and relax as much as possible will help their body heal. We don't want to put too much stress on their immune system and metabolism, since their body is already working in overdrive. Help them find a balance between activity and rest to help them stay healthy and active as much as possible without increasing symptoms.

Clustering care and important tasks early in the day can help the patient be more

productive and judge how their body will react so they do not overdo it throughout the day.

Follow Prescribed Diet

Have the patient follow the prescribed diet plan and educate them on it. Their diet may be high in vegetables, fruits, and whole grains to help their body fight off that inflammatory response; it may be high in protein as well to help replenish iron if it's low. The patient may also need to take supplemental iron, folic acid, and other vitamins to ensure they are getting proper nutrients, especially if they have a low red blood cell count and are anemic.

It's important to note that if the kidneys are compromised due to all the inflammation, the patient shouldn't eat a high-protein diet; protein is really hard on the kidneys if they are already damaged.

Patients with renal damage should follow a low-protein diet.

Give medications as prescribed and track intake and output and daily weight

Medications are often used as a last resort to help suppress the immune system:

- Mycophenolic acid
- Azathioprine
- Methotrexate

If the patient is taking corticosteroids, track their intake and output as well as their daily weights to make sure they aren't retaining too much fluid.

Antimalarial drugs like hydroxychloroquine might be helpful in reducing the immune response.

NSAIDs or steroids may be used to help combat the inflammatory response and reduce inflammation.

Watch for Medication Side Effects

Any time a patient is taking one or multiple medications, it's always super important to watch for side effects and make sure they aren't interacting with each other.

Assist with Plasmapheresis

You may also need to assist or educate the patient on plasmapheresis, which is super similar to dialysis, but it specifically removes antibodies from the blood. This can be super helpful with SLE/Lupus because of all those antigen-antibody complexes roaming around causing all that inflammation. Symptoms may be improved with those antibodies removed from the blood through plasmapheresis.