

## Mechanisms, Impact and Management of Photosensitivity in Lupus

Luis Ferreira\*

Department of Dermatology, University of Sao Paulo, Sao Paulo, Brazil

### DESCRIPTION

Photosensitivity, a heightened sensitivity to sunlight, is a well-documented feature of Systemic Lupus Erythematosus (SLE), an autoimmune disease that affects multiple organ systems. Patients with lupus often experience exacerbated symptoms upon exposure to Ultra Violet (UV) light, leading to skin rashes, flares, and worsening disease activity. Photosensitivity in lupus is not merely a cosmetic concern but a key element in managing the disease, as it can affect both physical well-being and quality of life.

The exact mechanisms behind photosensitivity in lupus are complex and multifactorial. The skin, which is frequently involved in lupus, contains immune cells that react abnormally to UV light, triggering an inflammatory response. In lupus, the immune system produces autoantibodies that attack the body's own tissues. When these autoantibodies are exposed to UV radiation, they form immune complexes, which accumulate in the skin. These complexes activate the complement system, a component of the immune system that triggers inflammation. This inflammatory cascade leads to skin lesions, rashes, and other symptoms. UV radiation, particularly UVB rays, can induce apoptosis in skin cells. In lupus patients, this apoptotic process can be abnormal, with the body's immune system mistakenly targeting and attacking the dying cells, exacerbating the immune response. This overreaction contributes to the characteristic rashes seen in lupus, such as the butterfly-shaped rash across the nose and cheeks. In lupus, there is often a defect in the DNA repair mechanisms of skin cells. UV radiation can cause DNA damage, and in individuals with lupus, this damage may not be repaired as efficiently, leading to increased inflammation and skin lesions. This defect is thought to contribute to the heightened sensitivity to sunlight seen in lupus patients. In many patients with lupus, the production of type I interferons is abnormally high. These interferons are immune signaling molecules that contribute to the inflammatory response. UV exposure can increase the levels of type I interferons, which in turn enhances the activation of immune cells and the inflammatory process in the skin, making lupus symptoms worse.

Photosensitivity in lupus is most often seen in the skin but can also exacerbate other systemic manifestations of the disease. Common clinical manifestations of photosensitivity include malar rash of lupus, a butterfly-shaped rash that spreads across the cheeks and nose, is often triggered or worsened by UV exposure. This rash may appear red or purple and is generally aggravated by sun exposure. Some lupus patients develop a chronic, localized form of skin involvement called Discoid Lupus Erythematosus (DLE), characterized by round, scaly, and raised lesions. These lesions are often more pronounced and more likely to scar when exposed to UV light. UV exposure may trigger or worsen kidney involvement, joint pain, and other internal manifestations of lupus. This can lead to increased disease activity, requiring adjustments in treatment. Chronic UV exposure in lupus patients can lead to premature skin aging, including wrinkles, loss of elasticity, and hyperpigmentation. Additionally, photosensitivity can cause scarring, especially if skin lesions become infected or if individuals continue to expose their skin to the sun without protection.

Managing photosensitivity is a crucial aspect of lupus care, as it can significantly affect a patient's overall quality of life. The most effective way to prevent photosensitivity reactions in lupus is through strict sun protection. Patients are advised to avoid direct sun exposure, especially during peak UV hours (10 a.m. to 4 p.m.). Patients should use sunscreens with high sun protection factor (SPF 30 or higher) that block both UVA and UVB rays. Sunscreen should be applied generously and reapplied every two hours, or more frequently if swimming or sweating. Wearing wide-brimmed hats, sunglasses, and long-sleeved clothing made of UV-protective fabrics can provide additional defense against sunlight. UV-blocking umbrellas, hats with neck flaps, and window shields can help minimize sun exposure during daily activities.

Educating patients about the risks of sun exposure and the importance of sun protection is crucial. Awareness of when and how to protect themselves from the sun, as well as understanding the connection between photosensitivity and lupus flares, can help patients better manage their condition and reduce the likelihood of flare-ups. Photosensitivity can significantly impact

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**Correspondence to:** Luis Ferreira, Department of Dermatology, University of Sao Paulo, Sao Paulo, Brazil, E-mail: luis.ferreira@usp.br

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the quality of life in lupus patients. The need to avoid sunlight can restrict outdoor activities, leading to social isolation and a decrease in physical activity. Additionally, the appearance of skin rashes and lesions can affect self-esteem and body image. These factors can contribute to psychological distress, making it essential to address both the physical and emotional aspects of the disease when managing photosensitivity.

## CONCLUSION

Photosensitivity is a characteristic feature of lupus, with UV light acting as a trigger for skin rashes and exacerbating other

systemic manifestations of the disease. The pathophysiology behind photosensitivity involves complex immune dysregulation, including the formation of immune complexes and an overactive type I interferon response. Proper management of photosensitivity involves a combination of sun protection, medication, and patient education to reduce flare-ups and improve quality of life. Through these measures, patients with lupus can better manage their condition, minimize skin damage, and prevent worsening of systemic symptoms.