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# Resolution of Lichen Simplex Chronicus With Nemolizumab: A Case Report

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## ABSTRACT

**Introduction:** Lichen simplex chronicus is a debilitating condition characterized by lichenified skin secondary to intractable itch. Lichen simplex chronicus is challenging to treat, with current treatment options, such as topical calcineurin inhibitors, gabapentinoids, and dupilumab, commonly being ineffective, leaving patients with worsening symptoms and poor quality of life.

**Case Presentation:** We report a case of lichen simplex chronicus in the setting of neuropathic pruritus successfully treated with nemolizumab in a 52-year-old woman. The patient did not report any side effects but reported significant improvement in quality of life.

**Conclusion:** Lichen simplex chronicus has a significant impairment on quality of life, as it has been linked to anxiety, depression, and poor sleep, underscoring the importance of proper disease management. Current treatment regimens for lichen simplex chronicus are often ineffective. Our observation suggests that nemolizumab may be effective in managing lichen simplex chronicus; larger studies are warranted to confirm these findings.

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## INTRODUCTION

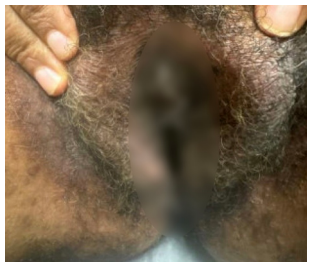
Lichen simplex chronicus (LSC) is a debilitating chronic itch condition, affecting up to 12% of the population, severely impacting patients' quality of life. It is characterized by lichenified skin secondary to intractable itch. Frequent scratching is an impetus for skin barrier disruption, leading to a pro-inflammatory state, sensory dysfunction, and an activated itch-scratch cycle, further perpetuating the condition. The pathogenesis of LSC is unclear. It is thought to be a non-histaminergic process mediated by pruritogen binding to G-protein coupled receptors or ion channels, particularly transient receptor potential channels, which may be an essential component in interleukin 31 (IL-31)-mediated itch.[1] Lichen simplex chronicus remains challenging to treat, with current options including topical calcineurin inhibitors, topical steroids, gabapentinoids, antidepressants, and dupilumab.[1] Here, we report the resolution of lichen simplex chronicus, previously refractory to a multitude of treatments, with nemolizumab.

### Report of a Case

A 52-year-old woman presented with an 8-year history of pruritus of the labia majora, which she described as burning and localized. The patient had a past medical history of hyperlipidemia, polycystic ovarian syndrome, prediabetes, atopic dermatitis, and, notably, an L4-L5 disc bulge secondary to a car accident 9 years prior. The patient had difficulty at work due to the constant itch she was experiencing, as well as her poor sleep. The pruritus was refractory to intralesional triamcinolone injections, a compounded ketamine, amitriptyline, and lidocaine (KAL) formulation, silver sulfadiazine cream, and pramoxine hydrochloride lotion. She did not tolerate gabapentin or pregabalin. Clobetasol and halobetasol did provide symptom relief but were discontinued due to the risk of atrophy from chronic use. The patient's physical exam is shown in Figure 1.

She was diagnosed with LSC in the setting of neuropathic pruritus secondary to bulging L4-5 discs. She was started on nemolizumab, which provided the patient with immediate relief. She received an initial loading dose of 60 mg injected subcutaneously, followed by 30 mg injections every 4 weeks. Just prior to receiving nemolizumab, the patient described the

**FIGURE 1.** Lichen simplex chronicus in the setting of neuropathic itch of the labia majora.



Lichenified pink to violaceous plaques with excoriations and hyperpigmentation on the bilateral labia majora.

itch as a 10 of 10, and 2 weeks after the injection, the patient described the itch as a 4/10. Two months after receiving her first injection, after receiving 4 total injections, the patient described the itch as a 0 of 10, and she was very happy with the results, improving her sleep and quality of life. The patient did not report any side effects.

## DISCUSSION

Nemolizumab is an IL-31 receptor alpha antagonist,[2] currently FDA approved for the treatment of atopic dermatitis and prurigo nodularis.[3] Treatment of prurigo nodularis with nemolizumab reduces itch intensity and sleep disturbance as early as week 4 of treatment,[2] which is similar to our case. The role of IL-31 in LSC has not been fully elucidated; however, it is known that IL-31 receptor A is expressed on epithelial and neuronal cells. $T_h2$ cells and immature dendritic cells secrete IL-31, in turn activating dorsal root ganglia neurons and keratinocytes. It is also known that IL-31 is implicated in skin barrier maintenance. Ultimately, IL-31 has been shown to play a role in neuroimmune communication, contributing to the itch sensation.[4,5] Common side effects of nemolizumab include headaches, atopic dermatitis, and increased infections; however, our patient did not experience any side effects to date.[2]

Chronic itch is closely linked to anxiety, depression, and significant quality of life impairment, deserving prompt diagnosis and management.[6] Current treatment regimens for LSC are often ineffective and may not lead to proper symptom resolution.[1] Our observation posits that nemolizumab may play a role in managing LSC and suggests that larger studies are needed to confirm our findings.

## DISCLOSURES

None of the authors have any relevant conflicts of interest to disclose.

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