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Epidural nerve block with lidocaine leads to clearance of psoriatic skin lesions

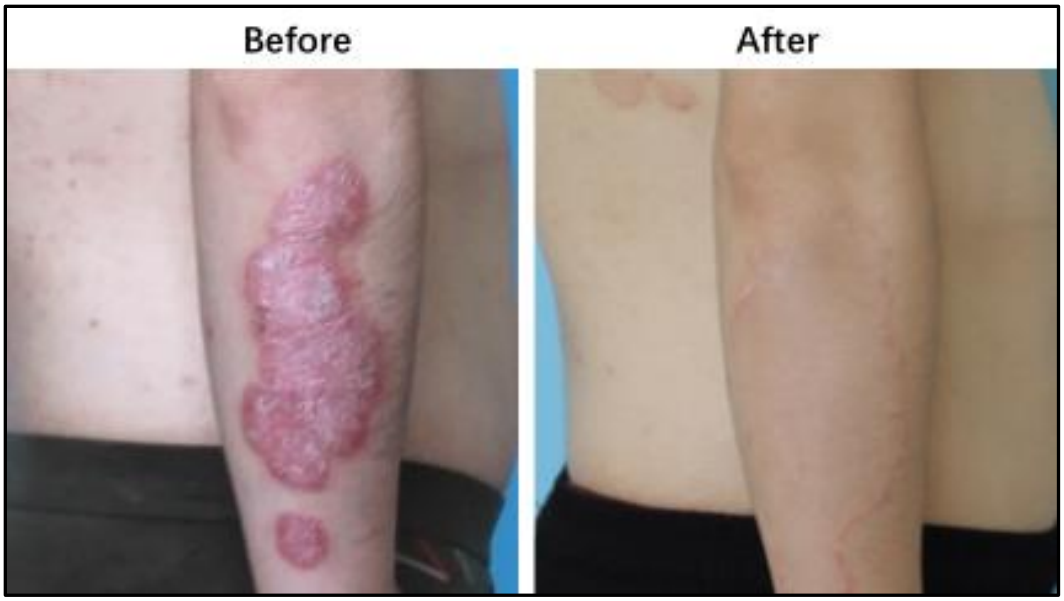
In this novel proof-of-concept study, investigators report in the Journal of Investigative Dermatology *on a new approach in treating psoriasis using an epidural nerve block with lidocaine*

Philadelphia, August 10, 2022 – Psoriasis is a chronic inflammatory, debilitating skin disorder. Although there is no cure for psoriasis, several treatment options can inhibit inflammation and relieve signs and symptoms of this disease. In this novel study in the *Journal of Investigative Dermatology*, published by Elsevier, investigators report surprising results for treating psoriasis using epidural lidocaine injections.

“Case studies have shown that psoriasis patients have experienced significant symptom relief after receiving epidural anesthesia during surgery, suggesting a pivotal role of the nervous system in psoriasis pathogenesis,” explained lead investigator Honglin Wang, PhD, Shanghai Institute of Immunology, Precision Research Center for Refractory Diseases, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China. “Additionally, there is increasing evidence linking the neuroimmune connection to psoriasis and other skin diseases. These factors inspired us to explore the possibility of directly targeting the nervous system for psoriasis treatment and the detailed mechanism of neuroimmune crosstalk in psoriasis.”

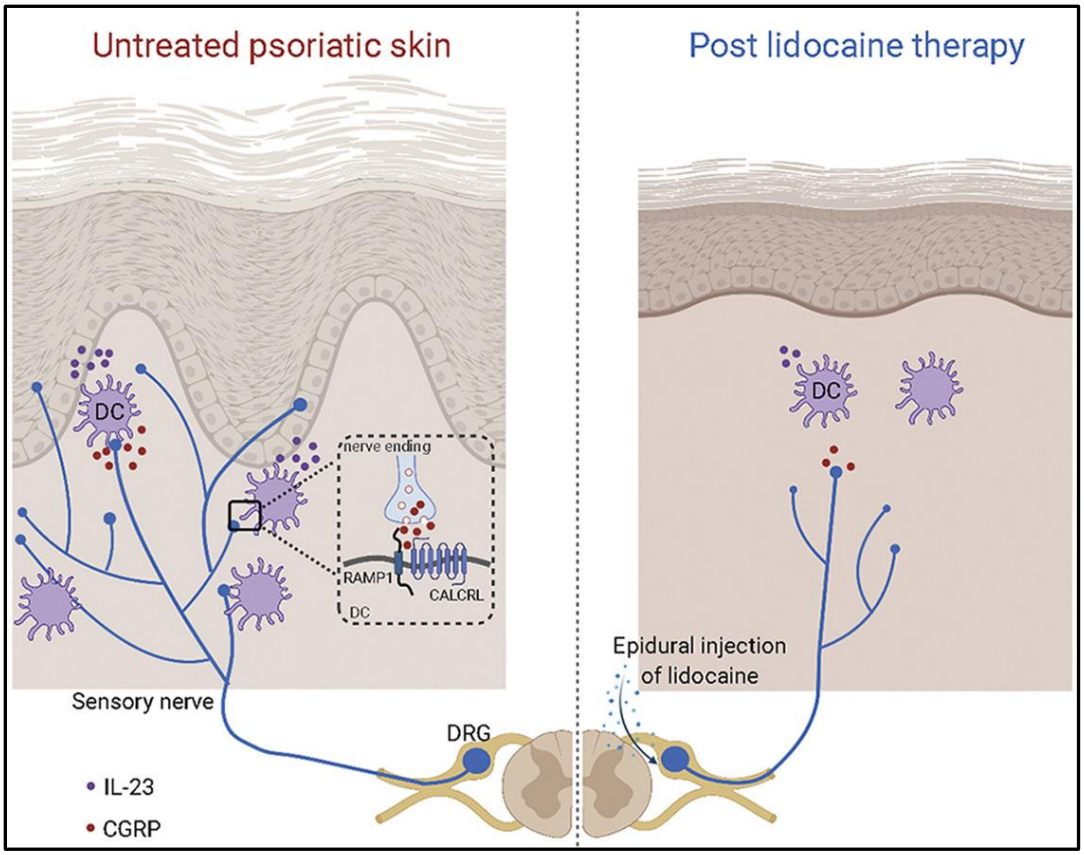
Investigators conducted a proof-of-concept study using an epidural injection of lidocaine to treat four patients with psoriasis. An epidural catheter was inserted between T12 (i.e., the 12th thoracic vertebra) and L1 (i.e., the first lumbar vertebra) of the spinal cord. Lidocaine solution was injected through the catheter. Each patient received three or four treatments in total. Two patients had psoriatic lesions throughout the whole body; two patients had psoriatic lesions mainly distributed on the legs.

By the end of the study period, all patients achieved remarkable improvements in almost all lesions, showing a 35%–70% reduction in Psoriasis Area and Severity Index (PASI) scores. Furthermore, skin improvements were maintained for at least 24 weeks after discontinuation of lidocaine treatment. No adverse effects occurred. This research provides the first clinical evidence that sensory nerves are potential targets for psoriasis treatment.



Caption: Photographs of a patient with psoriasis before (left) and after (right) epidural lidocaine treatment (Credit: Dr. Honglin Wang).

To evaluate the neuroimmune communication signaling in psoriasis and the mechanism for lidocaine therapy, investigators also conducted a number of experiments on rats in which a psoriasis-like skin inflammation had been induced. They found that lidocaine acts on sensory neurons by downregulating disordered neurite growth and proinflammatory CGRP (calcium gene-related peptide) release. Concomitantly, restricted $CGRP^{+}$ nerve density leads to reduced IL-23 production from dendritic cells, which express excessive CGRP receptors.



Caption: Epidural lidocaine treatment has a beneficial therapeutic effect on patients with moderate-to-severe psoriasis (Credit: *Journal of Investigative Dermatology*).

In summary, this proof-of-concept pilot study highlights the potential for epidural lidocaine injection as an effective and safe therapeutic strategy for psoriasis treatment and expands understanding of the role of the peripheral nerve system in

psoriasis and possibly other skin diseases. Manipulating the neuroimmune interplay puts a brake on neurogenic inflammation and downstream key inflammatory cytokine production, providing therapeutic prospects for sensory neuron–orchestrated inflammatory skin diseases.

“Epidural lidocaine therapy provides a novel choice for patients who respond poorly to the current treatment modalities for psoriasis,” added lead author Qianqian Yin, PhD, Shanghai Institute of Immunology, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China.

“Although these findings are promising, this was a small pilot study that lacks a placebo-controlled arm and controls to prevent interference by environmental changes. We next need to conduct large-scale clinical studies,” commented co-investigator Libo Sun, PhD, Shanghai Institute of Immunology, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China.

Psoriasis affects more than 3% of the US adult population. It is a chronic immune-mediated skin disorder with the peripheral sensory nervous system taking an active part in its pathogenesis. The most common type of psoriasis is plaque psoriasis. Symptoms are patches of skin that are dry, red and covered in silver scales that usually appear on the elbows, knees, lower back and scalp. There is no cure for psoriasis, but a range of systemic and topical treatments can relieve symptoms and signs and improve the appearance of skin patches.

Notes for editors

The article is “Lidocaine Ameliorates Psoriasis by Obstructing Pathogenic CGRP Signaling–Mediated Sensory Neuron–Dendritic Cell Communication,” by Qianqian Yin, Libo Sun, Xiaojie Cai, Fangzhou Lou, Yang Sun, Bin Wang, Bowen Jiang, Lan Bao, Xia Li, Ningjing Song, Sibei Tang, Jing Bai, Zhikai Wang, Yue Wu, Hong Zhou, Hong Wang, Buwei Yu, Qifang Li, and Honglin Wang (https://doi.org/10.1016/j.jid.2022.01.002). It appears online in volume 142, Issue 8 (August 2022) in the *Journal of Investigative Dermatology,* published by Elsevier.

The article is openly available at https://www.jidonline.org/article/S0022-202X(22)00007-0/fulltext.

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Full text of this publication is also available to credentialed journalists upon request; contact Theresa Monturano, Senior Publisher, Elsevier, at +1 215 239 3711 or hmsmedia@elsevier.com. Journalists wishing to interview the authors should contact Honglin Wang, PhD, at honglin.wang@sjtu.edu.cn.

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