doi:10.36849/JDD.8880

Exploring the Potential Dermatological Benefits of CGRP Inhibition: A Case Report

Olivia M. Burke BS,[a] Alexandra Cocores MD,[b] Jacob Beer MD,[a,c] Jonette E. Keri MD PhD[a,d]

[a]Dr. Phillip Frost Department of Dermatology & Cutaneous Surgery, University of Miami Miller School of Medicine, Miami, FL
[b]Department of Neurology, Headache Division, University of Miami Miller School of Medicine, Miami, FL
[c]Beer Dermatology, West Palm Beach, FL
[d]Miami VA Medical Center, Miami, FL

ABSTRACT

Calcitonin gene-related peptide (CGRP) is a neuropeptide involved in neurogenic inflammation and vasodilation, playing a key role in the pathophysiology of both migraines and inflammatory skin conditions, including acne and rosacea. This case report presents a 30-year-old woman with a long-standing history of cystic acne, which persisted despite numerous treatments, including antibiotics and hormonal therapy for polycystic ovary syndrome (PCOS). The patient was prescribed rimegepant, a CGRP receptor antagonist, for migraine management. Within four weeks of starting rimegepant, the patient experienced significant improvement in her cystic acne, particularly on her chin, which had been the most affected area. The painful lesions cleared almost entirely, and the patient reported a reduction in both cosmetic and physical discomfort. The cystic acne did not recur, except for a minor episode during a period of high stress. This case suggests that CGRP inhibition may have potential therapeutic benefits for inflammatory skin conditions such as cystic acne. The mechanism may involve modulation of neurogenic inflammation, which plays a role in the development of acne. CGRP's involvement in sebaceous gland activity and its inflammatory effects make it a promising target for acne treatment. Further studies are needed to explore the potential dermatological applications of CGRP antagonists like rimegepant in patients with acne and other inflammatory skin disorders. This case contributes to the growing body of evidence suggesting that CGRP inhibitors could offer benefits beyond migraine treatment, highlighting a novel therapeutic avenue for skin health management.

J Drugs Dermatol. 2025;24(6):636-637. doi:10.36849/JDD.8880

INTRODUCTION

Calcitonin gene-related peptide (CGRP) is a neuropeptide widely recognized for its role in vasodilation and neurogenic inflammation.[1] In acne, CGRP receptors are found in sebaceous glands, where the peptide contributes to the inflammatory response triggered by *Cutibacterium acnes*. Blocking CGRP may mitigate this inflammation, which is key in exacerbating conditions like cystic acne.[2] Recent studies have highlighted CGRP's significance in the pathophysiology of migraines and various inflammatory skin disorders, including rosacea and acne.[3] CGRP's involvement in skin health is particularly intriguing, as it modulates inflammation through its action on cutaneous immune cells, including keratinocytes, fibroblasts, and mast cells.[2] While CGRP antagonists like rimegepant are primarily used for migraine management, there is emerging evidence suggesting that these inhibitors may also offer benefits for skin conditions such as acne and rosacea.[3]

This case report details a patient who experienced an unexpected resolution of cystic acne after initiating rimegepant for migraine treatment. The potential role of CGRP inhibition in improving skin health offers a novel therapeutic perspective, warranting further investigation into the broader dermatological applications of CGRP antagonists.

CASE REPORT

The patient is a 30-year-old woman with a long-standing history of cystic acne and migraines. Diagnosed with cystic acne at the age of 14 by her pediatrician and dermatologist, she reported that her acne primarily affected her chin and perioral areas. In her twenties, she was diagnosed with polycystic ovary syndrome (PCOS), which her endocrinologist and gynecologist believed contributed to her persistent acne.

Over the years, the patient tried various treatments, including over-the-counter acne products and prescription medications such as sulfamethoxazole/trimethoprim, oral doxycycline, topical clindamycin, and tretinoin cream. Each treatment was used intermittently for approximately one year, but none produced significant or lasting improvements. The patient had also been on oral contraceptives, norethindrone, ethinyl estradiol, and ferrous fumarate, for nearly 10 years to manage

her PCOS, but this did not resolve her acne. Despite dietary changes, including the elimination of dairy, red meat, and sugar, her cystic acne remained unaffected.

The patient was prescribed rimegepant for migraine management, and within four weeks of starting the medication, she noticed a marked improvement in her cystic acne. The painful lesions on her chin cleared significantly, and she reported relief not only from the cosmetic aspect but also from the discomfort associated with the acne. Although she occasionally experienced few closed comedones, her cystic acne has not recurred.

DISCUSSION

This case provides an intriguing insight into the potential for CGRP inhibitors to benefit skin conditions such as cystic acne. While CGRP antagonists, like rimegepant, are primarily prescribed for migraines, the unexpected improvement in this patient's long-standing acne suggests a broader therapeutic application. Acne, particularly the cystic type, involves complex inflammatory processes, where the activation of sebaceous glands and immune responses play pivotal roles. The improvement observed in this patient supports the hypothesis that CGRP inhibition might reduce inflammation by directly impacting neurogenic pathways that exacerbate acne.

A noteworthy aspect of this case is the patient's lack of response to conventional treatments, including antibiotics and hormonal therapy, despite extensive attempts to control her acne. Rimegepant's ability to improve her skin condition within weeks suggests it might interrupt inflammation more effectively than traditional approaches. This improvement aligns with CGRP's known role in vasodilation and inflammation, particularly in sebaceous glands. By inhibiting CGRP, rimegepant may limit the pro-inflammatory environment that fuels severe acne. This case suggests that CGRP inhibitors like rimegepant may be an ideal therapeutic option for patients suffering from both cystic acne and migraines.

Further research is needed to determine whether CGRP inhibitors could serve as a targeted treatment for acne or other inflammatory skin diseases. Future studies might explore the duration and consistency of these effects and their applicability in broader populations. Additionally, assessing CGRP antagonists as part of a therapeutic regimen for patients with conditions like polycystic ovary syndrome (PCOS), where hormonal imbalance complicates treatment, could offer new avenues for management.

CONCLUSION

In conclusion, this case demonstrates the potential dermatological benefits of CGRP inhibition. Although more evidence is required to establish its role, the positive outcome in this patient highlights a promising area for further exploration in treating inflammatory skin disorders.

DISCLOSURES

No funding was received for this research. There are no conflicts of interest for this study.

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AUTHOR CORRESPONDENCE

Jonette E. Keri MD PhD
E-mail:..... jkeri@med.miami.edu