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Improvement of Rosacea With Tirzepatide: A Case Report

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INTRODUCTION

Tirzepatide is a dual glucagon-like pedtide-1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP) agonist and is primarily used to improve glycemic control along with weight reduction. It has also demonstrated anti-inflammatory effects via downregulating proinflammatory cytokines, including C-reactive protein (CRP) and interleukin-6 (IL-6).[1] Rosacea is chronic inflammatory disorder marked by recurrent flushing, erythema, telangiectasias, papules and pustules over the face resulting from the overexpression of Th1/Th17, toll-like receptor-2 (TLR-2), transient receptor protentional vanilloid-1 and ankyrin-1.[2] Demodex mite infestation on the skin is another trigger for the development of rosacea likely due to an immune reaction between the mites and the immune system resulting in chronic inflammation;however the full mechanism of action is not completely understood.[3] It has also been associated with other medical conditions, including cardiovascular disease, anxiety, diabetes mellitus, migraine, rheumatoid arthritis, and ulcerative colitis.[4] Disease control is usually achieved via a multipronged approach; however, GLP-1 receptor agonists may be a novel therapeutic option in this cohort of patients due to their anti-inflammatory effects.

We present a case of papulopustular rosacea that resulted in significant improvement following the initiation of tirzepatide, highlighting its potential as an adjunctive therapeutic option in obesity and metabolic dysfunction to achieve and maintain disease control.

CASE PRESENTATION

A 36-year-old woman presented with a past medical history of type 2 diabetes, obesity, asthma, premature ovarian failure, metabolic dysfunction associated with steatotic liver disease, hyperlipidemia, and papulopustular rosacea treated with twice daily sodium sulfacetamide 9% and sulfur 4% wash and 0.75% topical metronidazole cream with minimal improvement over the course of a year (Figures 1 and 2). She was then found to have uncontrolled diabetes with a hemoglobin A1c (HbA1c) of 11.6% and was started on tirzepatide injections weekly for diabetic control and weight loss. One month after initiating treatment with tirzepatide, the patient's rosacea markedly improved (Figure 3), and the patient was able to cut down on her treatment regimen to twice weekly.

FIGURE 1. Patient with papulopustular rosacea prior to initiation of tirzepatide.

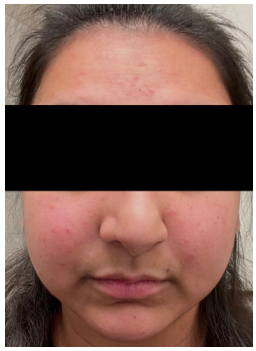


FIGURE 2. Patient with papulopustular rosacea prior to initiation of tirzepatide.

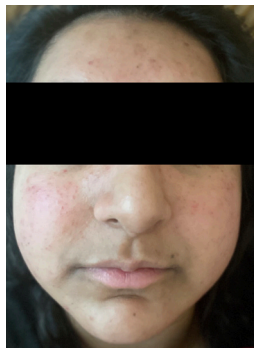
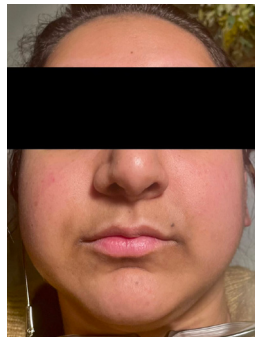


FIGURE 3. Improvement of rosacea one month after starting tirzepatide.



DISCUSSION

Obesity results in a proinflammatory state due to elevated levels of inflammatory cytokines and adipokines, including tumor necrosis factor-alpha (TNF-α), IL-6, IL-18, and leptin.[5] This chronic inflammation can lead to the development of insulin resistance, cardiovascular disease, liver diseases, cancer, and dermatologic changes including venous stasis, acanthosis nigricans, and skin tags.[6] Mechanical changes from obesity result in increased friction and moisture accumulation, leading to impaired skin barrier function, delayed wound healing, and proliferation of a vast microbiome consisting of bacteria, mites, and yeast. In patients with rosacea, obesity is an independent risk factor for development and is associated with an increased prevalence of a Demodex infestation contributing to the incidence of the disease.[7,8]

GLP-1 receptor agonists have been found to downregulate proinflammatory cytokines with significant reductions in TNF-α, CRP, IL-6, IL-1β, and leptin, along with regulating immune cell activity.[9] The overexpression of the TLR-2 receptor pathway, as seen in rosacea, results in immune cells secreting these proinflammatory cytokines, likely triggering its development and disease flare.[2,10] Given this pathogenesis, GLP-1 receptor agonists can reduce these proinflammatory cytokines and restore proper immune responses, resulting in a decrease in disease severity.

Due to these anti-inflammatory effects, GLP-1 agonists have shown efficacy as an adjunctive therapeutic measure in other inflammatory skin conditions like atopic dermatitis, hidradenitis suppurativa, and psoriasis. Patients treated with this medication class have shown decreased rates of usage of both topical and systemic corticosteroid usage consistent with diminished disease flare and significant improvement in disease severity demonstrated by reduction in Hurley scores, dermatology life quality index scores, and psoriasis area severity score.[11-15] Additionally, in psoriasis, GLP-agonists have demonstrated stroke reduction, incidence of atherosclerotic cardiovascular disease, and cardiovascular mortality.[16,17] With this pathogenesis in mind, assessment of rosacea severity is important in this cohort of patients, along with further studies clarifying its role in concomitant cardiovascular, gastrointestinal, neurological, psychiatric, and autoimmune diseases.

There are currently no reports of GLP-1 agonists used in the treatment of rosacea, and this case demonstrates improvement in the disease severity of rosacea after the initiation of tirzepatide. This case further suggests that the addition of GLP-1 agonists or dual GLP-1/GIP agonists in patients with rosacea may be an additional avenue of treatment for this condition. Further studies are needed to investigate the relationship between rosacea and GLP-1 agonists and dual GLP-1/GIP agonists, and whether or not there are differing outcomes in the development or severity of associated medical conditions.

DISCLOSURES

The authors have no financial relationships, conflicts of interest, or sponsorships to disclose.

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MNM. had full access to the data related to the case and takes responsibility for the integrity of the data and the accuracy of the information presented in the manuscript. All authors contributed substantially to the case report, data analysis and interpretation, and the drafting and clinical revision of the manuscript.

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