doi:10.36849/JDD8725

Exploring the Therapeutic Potential of GLP-1 Agonists in Hidradenitis Suppurativa

Aarthi Parvathaneni BA BS,[a*] Emelie N. McQuitty MD,[a*] Bailey Slawin BA,[a] Sanjana Likki BS,[a] T. Austin Black BS,[a] Nadeen Gonna MD,[c] Rashid M. Rashid MD PhD[b]

[a]University of Texas Health Science Center at Houston McGovern Medical School, Houston, TX
[b]Mosaic Dermatology, Houston, TX
[c]HCA Houston Healthcare Kingwood, Kingwood, TX

[*]co-first authors

INTRODUCTION

Hidradenitis suppurativa (HS) is a notoriously difficult-to-treat inflammatory skin condition characterized by the presence of deep, painful nodules, abscesses, tracts, and fibrotic scars, often occurring in intertriginous and apocrine gland-rich areas.[1] HS is associated with various comorbid conditions, including polycystic ovarian syndrome (PCOS), metabolic syndrome, and obesity, all of which share a lack of glycemic control.[2] With the emergence of GLP-1 agonists, and their increased use to achieve glycemic control, exploring their potential advantages for patients with HS is warranted. This letter examines the application of GLP-1 agonists in the treatment of HS to date.

MATERIALS AND METHODS

To identify case reports examining the use of GLP-1 agonists in the treatment of HS, a literature review of PubMed, Web of Science, and Embase using the search terms "hidradenitis suppurativa" and "GLP-1", was conducted on August 27th, 2024. Two authors (AP and ENM) screened all articles for inclusion and extracted data for the variables in Table 1.

RESULTS

Seventeen articles were identified, with two meeting inclusion criteria following review. For further details, see the PRISMA diagram in Figure 1. Both included articles showed initial weight loss and a reduction of disease severity following treatment with the GLP-1 agonist, Liraglutide (Table 1).[3,4]

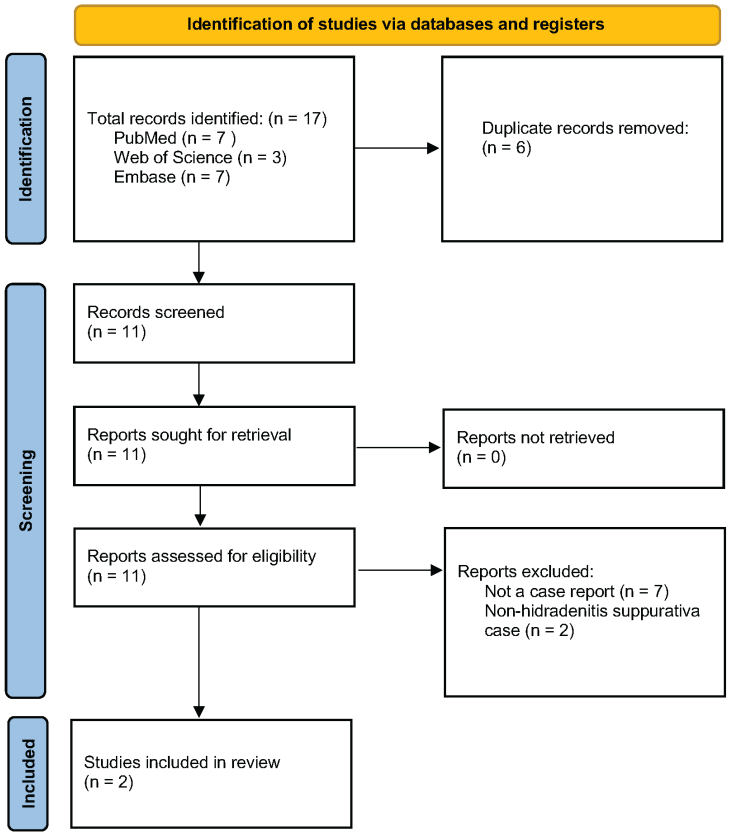
TABLE 1.

Included Case Studies and Their Respective Details

Case Report	Drug(s) Utilized	Demographic	Treatment Length	Treatment Results
Jennings et al (2017)	Liraglutide (0.6 mg -> titrated to 1.8 mg due to extensive disease)	31-year-old female, concurrent smoker, obesity	8 weeks	After 4 weeks of treatment, the patient had mild residual disease, and their DLQI improved from 24 to 14; after 8 weeks, they had lost 14 pounds
Khandalavala (2017)	Combination of Liraglutide Metformin, Levonorgestrel-ethinyl estradiol, dapsone, and finasteride	19-year-old female, concurrent polycystic ovarian syndrome (PCOS), fatty liver disease, obesity	3 years	Flares decreased in intensity and duration with no instances being reported in the 6 month period between treatment and case report publication. Liver enzymes normalized within one year of treatment, ESR reduced from 120 to 34 mm/hr, and an initial weight loss of 40 pounds

Dermatology Quality Life Index - DLQI: Maximum score of 30, with a larger number indicating a great impairment in quality of life.

FIGURE 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only.



DISCUSSION

While the pathogenesis of HS is incompletely understood and likely multifactorial, dysregulation of inflammatory pathways is known to be implicated. Specifically, the upregulation of numerous pro-inflammatory cytokines, including TNF-α, IL-1, IL-17, IL-23, and Th1 and Th17 lymphocytes, have been associated with HS. Liraglutide has been shown to exert its therapeutic effect among psoriasis patients by decreasing IL-17 and TNF-α induced cytokines. As such, Liraglutide may confer benefits to patients with HS in a similar matter.[3]

Additionally, patients with HS demonstrate high rates of obesity. Adipose tissue in obese patients actively triggers a state of chronic low-grade systemic inflammation. Adipocyte hypertrophy drives the release of adipocytokines (TNF-α, IL-1β, and IL-6) and other pro-inflammatory mediators.[5] Body mass index (BMI), as well as increased levels of cytokines, has been associated with worse skin disease severity in psoriasis patients, which makes it likely that these same adipocytokines may contribute to other inflammatory skin diseases like HS.[3]The presence of adipose tissue in obese individuals results in the release of pro-inflammatory cytokines. Thus, weight loss likely contributes to decreased pro-inflammatory cytokines associated with inflammatory skin conditions like HS.

CONCLUSION

The interrelation between GLP-1 agonists and the treatment of HS lacks sufficient investigation within the current medical literature. This letter critically assesses all reported cases of GLP-1 agonists in the treatment of HS to date for etiology and clinical characteristics, with the ultimate goal of urging future clinical trials to determine the drug's wide-scale benefits.

DISCLOSURES

All authors have no conflicts of interest to declare.

REFERENCES

1. Ballard K, Shuman VL. Hidradenitis Suppurativa. In: StatPearls. Treasure Island (FL): StatPearls Publishing; April 17, 2023.
2. Tzellos T, Zouboulis CC. Review of comorbidities of hidradenitis suppurativa: implications for daily clinical practice [published correction appears in *Dermatol Ther (Heidelb).* 2020;10(3):523. doi: 10.1007/s13555-020-00366-y]. *Dermatol Ther (Heidelb).* 2020;10(1):63-71. doi:10.1007/s13555-020-00354-2
3. Jennings L, Nestor L, Molloy O, et al. The treatment of hidradenitis suppurativa with the glucagon-like peptide-1 agonist liraglutide. *Br J Dermatol.* 2017;177(3):858-859. doi:10.1111/bjd.15233
4. Khandalavala BN. A disease-modifying approach for advanced hidradenitis suppurativa (regimen with metformin, liraglutide, dapsone, and finasteride): a case report. *Case Rep Dermatol.* 2017;9(2):70-78. doi:10.1159/000473873
5. Guo Z, Yang Y, Liao Y, et al. Emerging roles of adipose tissue in the pathogenesis of psoriasis and atopic dermatitis in obesity. *JID Innov.* 2021;2(1):100064. doi:10.1016/j.xjidi.2021.100064

AUTHOR CORRESPONDENCE

Rashid. M Rashid MD PhD

E-mail:..... rashidmdphd@gmail.com