SKIN

RESEARCH LETTER

Trends of Metformin Use in Patients with Hidradenitis Suppurativa, 2016-2021

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ABSTRACT

Introduction: Hidradenitis Suppurativa (HS) is a dermatologic condition that is comorbid with diabetes mellitus (DM) and polycystic ovarian syndrome (PCOS). Metformin has been used as a therapy in DM and PCOS, but little research has been done to see if it is being used in patients with HS.
Methods: Using MarketScan, information on HS, DM, and PCOS diagnoses were collected from January 1, 2016 through December 31, 2021. Metformin prescription information was also collected on these patients.
Results: During the study, the percentage of HS patients with a metformin prescription increased ($Z = -9.6$, $p<0.001$). Metformin prescriptions in patients with HS but without DM or PCOS diagnoses also increased ($Z= -13.1$, $p<0.001$).
Discussion: Metformin offers promising therapeutic options for the treatment of patients with HS, even if they do not have comorbid conditions.

INTRODUCTION

Hidradenitis Suppurativa (HS) is a dermatologic condition characterized by recurrent and painful nodules in intertriginous areas.[1] Common comorbidities that occur with HS include Diabetes Mellitus (DM) and Polycystic Ovarian Syndrome (PCOS).[2] The drug metformin has been utilized in treating type II DM for decades. Metformin has anti-inflammatory properties; specifically reducing levels of TNF-α and IL-17, which have been implicated in the pathophysiology of HS.[3,4] The aim of this study was to analyze the use of metformin in patients with HS over time.

METHODS

A retrospective database analysis was completed with the MarketScan Commercial Claims and Encounters Data (IBM) from January 1, 2016 – December 31, 2021. International Classification of Diseases (ICD) codes, 9th and 10th editions, identified annual HS, PCOS, and DM diagnoses. Metformin prescriptions among these patients were identified with National Drug Codes. Trends of HS diagnoses and metformin use were analyzed in SAS version 9.4 using Cochrane-Armitage Trends tests for linear association with two-sided p-value significance defined as <0.05 (SAS Institute, Cary, NC, USA).

Table 1: Diagnoses per year, 2016-2021

Characteristic	Year					
	2016 (n=19070) n (%)	2017 (n=19136) n (%)	2018 (n=20929) n (%)	2019 (n=21041) n (%)	2020 (n=21062) n (%)	2021 (n=23728) n (%)
HS	19070	19136	20929	21041	21062	23728
Male	4507	4282	4816	4741	4468	4977
Female	14563	14854	16113	16300	16594	18751
Mean Age	35.0	35.0	34.9	34.8	34.7	35.0
Region						
Northeast	3117	2967	3554	3549	3286	2923
North Central	3854	3840	4267	4034	3977	4864
South	9811	10165	10580	11153	11280	12950
West	2209	2120	2479	2236	2472	2956
Unknown	79	44	49	69	47	35
HS & Metformin	1812 (9.5)	1820 (9.51)	2015 (9.63)	2151 (10.2)	2279 (10.82)	2818 (11.8)
HS & Metformin w/o DM	732 (3.84)	850 (4.44)	970 (3.95)	1055 (4.25)	1192 (4.86)	1504 (5.44)
HS & Metformin w/o DM & w/o PCOS	596 (3.13)	734 (3.84)	826 (3.95)	895 (4.25)	1023 (4.86)	1290 (5.44)

RESULTS

Between 2016 and 2021, 95,329 unique patients aged 10-65 years were diagnosed with HS, with a mean age of 34.9 years. Of those diagnosed with HS, 22% were male and 78% female. Overall, 10,296 (10.8%) patients with HS had at least one metformin prescription. Of these, 48.5% (n=4,996) did not have a concurrent diagnosis of DM, 89.9% (n=9,254) did not have a concurrent PCOS diagnosis, and 40.2% (n=4,136) did not have a concurrent DM or PCOS diagnosis (**Table 1**).

From 2016-2021, the percentage of HS patients with a metformin prescription increased ($Z = -9.6$, $p<0.001$). When patients with concomitant DM and/or PCOS were removed from the analysis, the percentage of HS patients with a metformin prescription remained increased ($Z = -13.3$, $p<0.001$ and $Z = -13.1$, $p<0.001$, respectively) (**Figure 1**).

DISCUSSION

From 2016-2021, the percentage of HS patients with a metformin prescription increased ($Z = -9.6$, $p<0.001$). Metformin prescriptions in patients with HS but without DM or PCOS diagnoses also increased ($Z= -13.1$, $p<0.001$). This increase in the proportion of HS patients with a metformin prescription equates to a 2.3% increase from 2016 (9.5%) to 2021 (11.8%). Similarly, when removing the comorbidities of DM and PCOS, there was a 2.3% increase from 2016 (3.1%) to 2021 (5.4%).

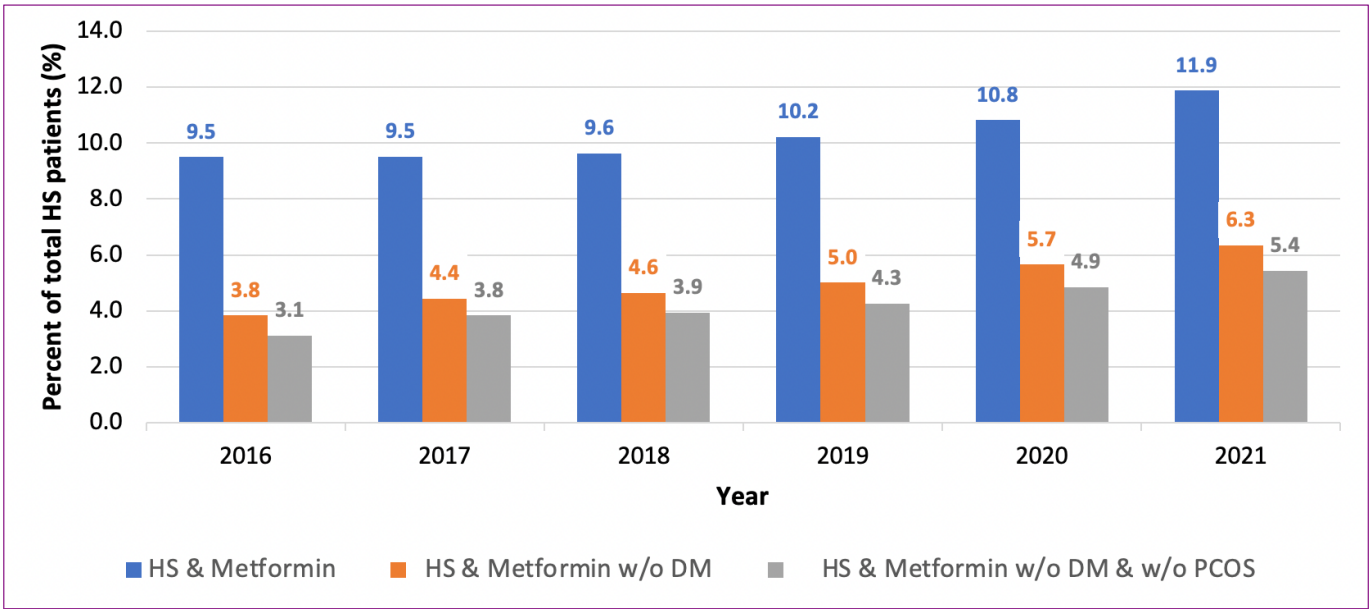

Figure 1: Percentage of HS individuals with metformin prescriptions, 2016-2021

It is known that DM is more common in HS patients compared to the average population. The prevalence of DM in HS patients is 10.6% compared to 3.8% in non-HS patients.[5] Prior studies have shown that DM diagnoses in HS patients have increased over recent years, so it is expected that metformin use in these patients is also increasing, which is a not surprising result of this study. However, it is interesting that when DM is removed from the analysis, metformin prescriptions are still increasing in HS patients. Recent studies have shown that metformin is efficacious for HS patients, including pediatric patients.[3]

Limitations of this study include the utilization of a private commercial claims database, therefore excluding patients with public insurance or other types of insurance. Furthermore, the exact clinical indication reason for the metformin prescription could not be determined from the dataset. Additionally, without clinical data, this study could not evaluate HS, PCOS, or DM severity or treatment response.

In closing, this study shows an increase in metformin prescriptions among HS patients which may represent an increased comfort level of prescribing metformin among dermatologists. Metformin is a possible therapy for HS patients, even if they do not have comorbid DM or PCOS diagnoses. A current clinical trial (NCT04649502) is comparing therapeutic efficacy of doxycycline and metformin vs. doxycycline and placebo.[6] Positive results of this trial would be encouraging for adding metformin to the treatment landscape.

Conflict of Interest Disclosures:
Joslyn S Kirby: Employee of Incyte Corporation; Advisory Board: AbbVie, Incyte, Novartis, UCB; Consultant: AbbVie, Alumis, DermTech, Guidepoint, Incyte, Insmed, Janssen, Moonlake, Novartis, UCB

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