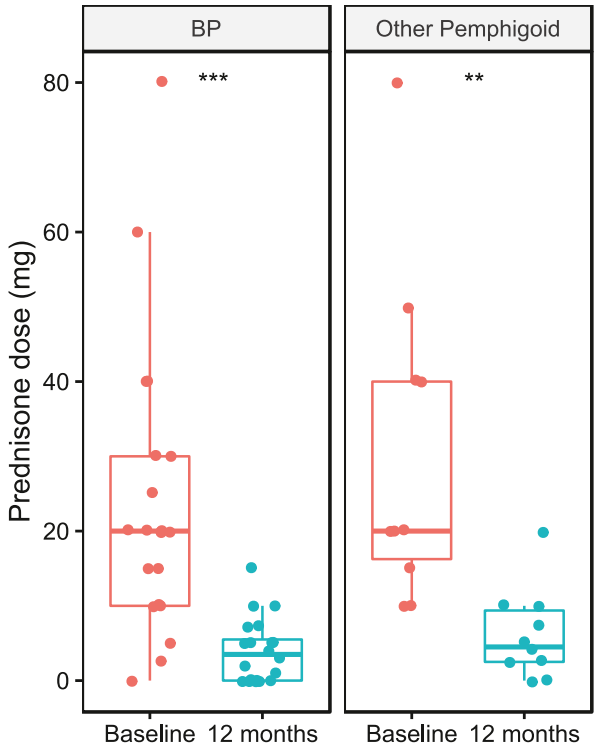

Fig 1. Rituximab is an effective steroid-sparing therapy in pemphigoid. Significant reduction in daily prednisone dose 12 months after the first cycle of rituximab in patients with bullous pemphigoid (BP) and other pemphigoid diseases. $^{*}P \leq .05$; $^{**}P \leq .01$; $^{***}P \leq .001$; ns, not significant compared with baseline values.

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REFERENCES

1. Murrell DF, Daniel BS, Joly P, et al. Definitions and outcome measures for bullous pemphigoid: recommendations by an international panel of experts. *J Am Acad Dermatol*. 2012;66(3):479-485.
2. Murrell DF, Marinovic B, Caux F, et al. Definitions and outcome measures for mucous membrane pemphigoid: recommendations of an international panel of experts. *J Am Acad Dermatol*. 2015;72(1):168-174.

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Hidradenitis suppurativa encounters in a national electronic health record database notable for low dermatology utilization, infrequent biologic prescriptions, and frequent opiate prescriptions

To the Editor: Hidradenitis suppurativa (HS) is an understudied disease. Our objective was to characterize HS encounters, including providers seen, medications prescribed, and procedures performed, which to our knowledge have not previously been reported.

We performed a cross-sectional study of encounters using a random sample of the OptumInsights Electronic Health Record Database (previously Humedica[1-3]; Optum Inc, Eden Prairie, MN) from January 2007 to June 2017. Eligible encounters had an HS diagnosis code (*International Classification of Diseases* [ICD] Ninth Clinical Modification [ICD-9] 705.83, and Tenth Clinical Modification [ICD-10] L73.2) and specified a setting (eg, outpatient, inpatient) or had a prescription written. We compared nonantibiotic systemics (listed in Table I) before and after United States Food and Drug Administration approval of adalimumab and compared provider specialty and opiate prescriptions in HS vs psoriasis (defined by ICD-9 696.1, ICD-10 L40.0-40.4, L40.8, or L40.9) using χ^2 tests.

In outpatient visits without procedures, we tested whether a dermatology encounter was associated with a nonantibiotic systemic or opiate prescription using multivariable logistic regression, adjusted for age, sex, race, and region, and using generalized estimating equations to account for patients with multiple encounters. To further address potential within-patient correlations, we performed bootstrapped sensitivity analyses with 100 replications. Finally, we performed a sensitivity analysis of patients with 2 or more HS diagnoses, as the positive predictive value of a single diagnosis is 77% to 79%.[4,5]

In our data set of approximately 7.7 million patients, 22,331 encounters in 8539 patients met inclusion criteria. Patient demographics are reported in Table II. Encounter characteristics (setting, provider, medications, and procedures) are reported in Table I. In HS, 20.3% of encounters were with a dermatology provider compared with 49.0% of psoriasis encounters ($P < .001$).

The 10 most common prescriptions written were doxycycline, topical clindamycin, sulfamethoxazole-trimethoprim, hydrocodone-acetaminophen, cephalexin, oral clindamycin, oxycodone-acetaminophen, minocycline, amoxicillin-potassium clavulanate, and topical mupirocin. Use of nonantibiotic systemic medications was low (2.7%) but increased after United States Food and Drug Administration approval of adalimumab ($P = .001$). In total, 18.1% of patients received an opiate prescription during an HS encounter compared with 8.5% of psoriasis patients ($P < .001$). In outpatient visits without skin procedures, seeing a dermatology provider had an odds ratio of 0.23 (95% confidence interval, 0.17-0.31) for opiates and an odds ratio of 6.44 (95% confidence interval, 4.87-8.52) for nonantibiotic systemic medications. When we performed bootstrapped sensitivity analyses, the odds ratios were similar.

Table I. Setting, provider, medications, and procedures in hidradenitis suppurativa encounters

Hidradenitis suppurativa encounters	No.	No. (%)
Setting*	22,019	
Outpatient		15,928 (72.3)
Inpatient		1602 (7.3)
Emergency department		1133 (5.2)
Home health or skilled nursing		547 (2.5)
Prescription-only		2809 (12.8)
Provider†	20,752	
Dermatology		4207 (20.3)
Surgery		4652 (22.4)
Family or internal medicine		10,765 (51.9)
Emergency medicine		2176 (10.5)
Pediatrics		1012 (4.9)
Obstetrics/gynecology		1361 (6.6)
Prescription medications	22,331	
Oral antibiotics		8207 (36.8)
Topical antibiotics		2847 (12.7)
Nonantibiotic systemic medications‡		594 (2.7)
Pre-FDA adalimumab approval	14,009	334 (2.4)§
Post-FDA adalimumab approval	8322	260 (3.1)§
Biologics¶		183 (0.8)
Nonbiologic systemics‖		420 (1.9)
Opiates (all encounters)		2993 (13.4)
Opiates (nonprocedural encounters)#	20,473	2659 (13.0)
Dermatology	3392	84 (2.5)
Surgery	4237	798 (18.8)
Family or internal medicine	10,151	1259 (12.4)
Emergency medicine	1745	482 (27.6)
Pediatrics	962	89 (9.3)
Obstetrics/gynecology	1307	87 (6.7)
Procedures**	19,522	
Any skin procedure		1858 (9.5)
Incision and drainage		931 (4.8)
Surgery (deroofing, biopsy, excision, reconstruction)		248 (1.3)
Injection		675 (3.5)

CPT, Current Procedural Terminology (American Medical Association, Chicago, IL), *FDA*, Food and Drug Administration; *No.*, number.

*312 encounters had >1 setting recorded (eg, emergency and inpatient) and are not included.

†Percentages may add up to >100% because >1 provider could be associated with each encounter, and 1 provider could list >1 specialty.

‡Nonantibiotic systemic medications included adalimumab, infliximab, anakinra, ustekinumab, cyclosporine, acitretin, isotretinoin, finasteride, and spironolactone.

§The χ^2 test was used to compare nonantibiotic systemic medications before and after FDA approval of adalimumab ($P = .001$)

¶Biologic medications included adalimumab, infliximab, anakinra, and ustekinumab.

‖Nonbiologic systemic medications included cyclosporine, acitretin, isotretinoin, finasteride, and spironolactone.

#Percentages may add up to >100% because >1 provider could be associated with each encounter, and 1 provider could list >1 specialty. Displayed are the percentages of specialty encounters (excluding encounters with skin procedures) that had opiate prescriptions.

**Any skin procedure includes all of the following: incision and drainage codes Current Procedural Terminology (CPT; American Medical Association, Chicago, IL) 10060, 10061, 10080, 10140, 10160, 19020, 46040, 46050, and *International Classification of Diseases, Ninth Clinical Modification* (ICD-9) 86.04; surgery codes CPT 10040, 11100, 11450-11471, ICD-9 86.11, 86.24; injection codes CPT 11900, 11901, Healthcare Common Procedure Coding System (HCPCS) J3301.

A sensitivity analysis of patients with 2 or more HS diagnoses yielded similar results, except the percentage of patients who received opiate prescriptions was higher (29.0%).

Our findings show that HS encounters occur most commonly with family or internal medicine providers and that opiates are frequently prescribed, while nonantibiotic systemic treatments are

Table II. Demographics of patients with hidradenitis suppurativa

Variable	Data set value
Demographic	
Sex, No. (%)	
Female	6438 (75.4)
Male	2091 (24.5)
Missing	10 (0.1)
Age at first HS encounter, No. (%)	
0-17 y	657 (7.7)
18-29 y	2494 (29.2)
30-39 y	2000 (23.4)
40-49 y	1521 (17.8)
50-59 y	1186 (13.9)
≥60 y	681 (8)
Race, No. (%)	
White	5082 (59.5)
African American	2278 (26.7)
Asian	125 (1.5)
Other/unknown	1054 (12.3)
Ethnicity, No. (%)	
Hispanic	499 (5.8)
Not Hispanic	7172 (84)
Unknown	868 (10.2)
Census region	
Midwest	4082 (47.8)
South	2361 (27.7)
Northeast	863 (10.1)
West	805 (9.4)
Other/unknown	428 (5)
Follow-up in the data set, mean (SD) y	6.8 (3.5)
HS encounters, No. (%)	
1	5168 (60.5)
≥2	3371 (39.5)

HS, Hidradenitis suppurativa; *No.*, number; *SD*, standard deviation.

infrequently prescribed. Outpatient nonprocedural encounters with dermatology providers were less likely to have opiate and more likely to have nonantibiotic systemic prescriptions.

Among the study limitations are that it is retrospective and cross-sectional. HS diagnoses cannot be validated in this data set (although they have been previously[4,5]), and undiagnosed HS cannot be captured. In addition, HS encounters may have included other medical problems besides HS, which we did not evaluate, although the 10 most common prescriptions in these encounters were all HS treatments.

Low use of dermatology providers and infrequent nonantibiotic systemic therapy highlight the need for improved dermatology access, and the substantial opiate prescriptions highlight the need for more effective management strategies in HS.

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REFERENCES

1. Nunes AP, Yang J, Radican L, et al. Assessing occurrence of hypoglycemia and its severity from electronic health records of patients with type 2 diabetes mellitus. *Diabetes Res Clin Pract*. 2016;121:192-203.
2. Walker AM, Zhou X, Ananthakrishnan AN, et al. Computer--assisted expert case definition in electronic health records. *Int J Med Inform*. 2016;86:62-70.
3. Bae JP, Lage MJ, Mo D, Nelson DR, Hoogwerf BJ. Obesity and glycemic control in patients with diabetes mellitus: analysis of physician electronic health records in the US from 2009-2011. *J Diabetes Complications*. 2016;30(2):212-220.
4. Garg A, Kirby JS, Lavian J, Lin G, Strunk A. Sex- and age-adjusted population analysis of prevalence estimates for hidradenitis suppurativa in the United States. *JAMA Dermatol*. 2017;153(8):760-764.
5. Shlyankevich J, Chen AJ, Kim GE, Kimball AB. Hidradenitis suppurativa is a systemic disease with substantial comorbidity burden: a chart-verified case-control analysis. *J Am Acad Dermatol*. 2014;71(6):1144-1150.

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