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# Increased utilization of emergency department and inpatient care by patients with hidradenitis suppurativa

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**Background:** Hidradenitis suppurativa (HS) is a chronic cutaneous disease with acutely painful flares. In a prior study of all-cause utilization, patients with HS had higher utilization of emergency department (ED) and inpatient care.

**Objective:** We sought to assess utilization of medical care specifically related to HS, especially high-cost settings.

**Methods:** The MarketScan medical claims database was examined for participants with either HS or psoriasis based on *International Classification of Diseases, Ninth Revision* codes, during the study period, January 2008 to December 2012. This was a cohort cost-identification study with analyses of utilization measures and direct costs.

**Results:** The proportion of the HS cohort hospitalized was 5.1% and was higher than the psoriasis cohort (1.6%) ( $P < .0001$ ). The proportion of patients who used the ED was also higher in the HS cohort (7.4% vs 2.6%,  $P < .0001$ ). When compared with a subset of patients with severe psoriasis, the proportions of patients with HS who used the ED (7.4% vs 4.2%,  $P < .0001$ ) or inpatient care (5.1% vs 2.5%,  $P < .0001$ ) remained elevated.

**Limitations:** The study sample may not be generalizable to other patient populations and may represent those with more severe disease. Pharmaceutical costs were not included and confounding factors such as race, socioeconomic status, and insurance type were not investigated.

**Conclusion:** Patients with HS had increased utilization of high-cost settings, such as the ED and inpatient care, compared with patients with psoriasis, another chronic inflammatory disease. Both patients and providers should be aware of this finding and further work is needed to incorporate assessment of patient outcomes. (J Am Acad Dermatol 2015;73:609-14.)

**Key words:** acne inversa; direct cost; emergency department; health services research; hidradenitis suppurativa; high-cost venue; hospitalization; inpatient; psoriasis.

**H**idradenitis suppurativa (HS), also referred to as acne inversa, is a chronic, recurrent inflammatory skin condition resulting in abscesses, fistula formation, and scarring in apocrine gland-bearing regions such as the axilla, groin, and inframammary areas.<sup>1,2</sup> Acutely painful abscesses may lead to the use of high-cost services such as

#### Abbreviations used:

ED: emergency department  
HS: hidradenitis suppurativa  
ICD-9: *International Classification of Diseases, Ninth Revision*  
LOS: length of stay

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Funding sources: None.

Conflicts of interest: None declared.

Accepted for publication June 23, 2015.

Reprints not available from the authors.

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Published online July 16, 2015.

0190-9622/\$36.00

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<http://dx.doi.org/10.1016/j.jaad.2015.06.053>

inpatient and emergency department (ED) for care that could be delivered capably in the outpatient setting.<sup>3</sup> A prior study showed that patients with HS have a higher utilization of inpatient and ED services compared with patients who have psoriasis, another chronic skin condition.<sup>4</sup> These areas have been labeled “high-cost settings,”<sup>5,6</sup> so are a target for investigation and intervention as health care systems and providers aim to increase clinical value. Value has been defined as a combination of the patient’s perspective or outcome and the quality/quantity of health outcomes for the resources spent.<sup>7</sup> The prior study assessed all-cause resource utilization and was not able to investigate resource utilization specifically for HS. Thus, the objective of this study is to assess health care utilization and cost related to HS and compare this to patients with psoriasis, another chronic inflammatory skin disease.

## METHODS

The Milton S. Hershey Medical Center Institutional Review Board considered the study exempt. A retrospective cohort method was used to perform a cost-identification study. Patients with HS were compared with those with psoriasis, because both are chronic, inflammatory conditions with intermittent flares and associated with higher rates of obesity, tobacco use, and depression.<sup>8-10</sup>

## Data source and variables

A retrospective analysis of the Truven Health MarketScan Commercial Claims and Encounters Database (Truven Health Analytics, King of Prussia, PA) was performed. The MarketScan database contains health insurance claims that are voluntarily submitted by approximately 100 payers for over 120 million insured individuals in the United States, making the database representative of the commercially insured population in the United States. As a claims database, clinical outcomes are not included, and validation studies of the variables have not been performed.

Patient characteristics including age, gender, and comorbid conditions based on *International Classification of Diseases, Ninth Revision (ICD-9)* documentation on claims were extracted. HS was

defined by *ICD-9* code 705.83 and psoriasis by code 696.1. Diabetes mellitus was defined as *ICD-9* codes 250.00 to 250.99, cardiovascular disease as codes 401.00 to 449.99, tobacco use or abuse as codes 305.00 to 305.03 and 305.1, major depression as codes 296.20 to 296.36, and essential hypertension as codes 401.00, 401.10, and 401.90.

The utilization and cost variables included inpatient, outpatient, ED, and total expenditures along with the inpatient length of stay (LOS) in days and number of outpatient physician and ED visits. The cost of care was calculated from the health system perspective and was the sum of payments by the insurer and the patient. Only claims with the *ICD-9* code for HS or psoriasis were included. Costs were adjusted for inflation based on the medical care component of the Consumer Price Index and are reported in 2012 US dollars.<sup>11</sup>

## CAPSULE SUMMARY

- In a previous study, patients with hidradenitis suppurativa were shown to have increased all-cause utilization of health care services.
- We show that patients with hidradenitis suppurativa are more likely to receive care for their skin condition in the hospital or emergency department.
- The value, encompassing outcomes, and cost for hidradenitis suppurativa management need to be investigated because of the increased use of high-cost venues.

## Study population

A 5-year study period was used (January 2008–December 2012). The study sample included only continuously enrolled individuals. Patients with 2 or more claims for either HS or psoriasis (and no claims for the other condition) at any time during the 5-year study period were included. The requirement for 2 or more claims was added because validation studies have not been performed on this data set. A similar study on a large claims database demonstrated that the rate of HS was similar to that seen in cohort studies.<sup>12</sup> A severe psoriasis cohort was derived from the psoriasis cohort similar to methods in other studies.<sup>13-16</sup> The patients included in this subcohort were patients from the psoriasis cohort with a claim at any time during the study period for phototherapy, acitretin, azathioprine, methotrexate, mycophenolate mofetil, or cyclosporine.

## Statistical analysis

Descriptive statistics were used to describe the age and sex distributions of the cohorts and the health care utilization and cost data. Calculations included only those members with claims. Differences between cohorts were explored; comparisons of categorical outcomes were made using the  $\chi^2$  test. Comparisons of continuous outcome variables were made using the *t* test. Multivariate analyses of costs

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