In total, 27 patients with HS and 9 control individuals were included. There were no statistical differences between the cohorts based on sex, age, race, or body mass index. The HS cohort was majority female (92.6%), African American race (59.3%), with an average age of 37.3 ± 14.5 years and average body mass index (BMI) in the obese range of 35.5 ± 8.2 kg/m^2. The control group was also majority female (88.9%) and of African American race (66.7%), with an average age of 37.1 ± 13.3 years and average BMI in the obese range (32.9 ± 6.8 kg/m^2).

No statistically significant differences were found in cytokine levels for patients with HS versus control individuals. Additionally, multivariate analysis of variance failed to show variation based on BMI, smoking status, disease severity, or duration. Upon subgroup analysis by race, the following 6 cytokines were lower in African American patients with HS (n = 16) compared to other races (n = 11): TNF-α ($P = .01$), IL-22 ($P = .05$), IL-23 ($P = .01$), IL-17F ($P = .01$), IL-27 ($P = .05$), and IL-10 ($P = .03$) (see Fig 1).

African American race has been associated with increased HS prevalence, treatment resistance,[4] and increased risk of other fibroproliferative disorders. This risk is thought to be due to evolutionary gene selection protecting against helminth infections. Previously demonstrated racial variation in inflammatory genes may in part explain differences in susceptibility and outcomes.[5] Further genetic studies are needed to evaluate this relationship.

A limitation of this study includes the small sample size. Larger studies evaluating the immunopathogenesis of HS are needed. Furthermore, whether variation in cytokine levels among races in patients with HS contributes to treatment outcomes is yet to be determined. At the least, race should be reported in studies evaluating the etiology and treatment of HS. Whenever possible, efforts should be made to include a racially diverse cohort in HS research so that results can be translated to real-world clinical practice.

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Real-world experience of adalimumab in the treatment of hidradenitis suppurativa

To the Editor: Adalimumab, a fully human IgG monoclonal antibody that targets tumor necrosis factor-α, is the only approved drug to treat moderate-severe hidradenitis suppurativa (HS).[1,2]

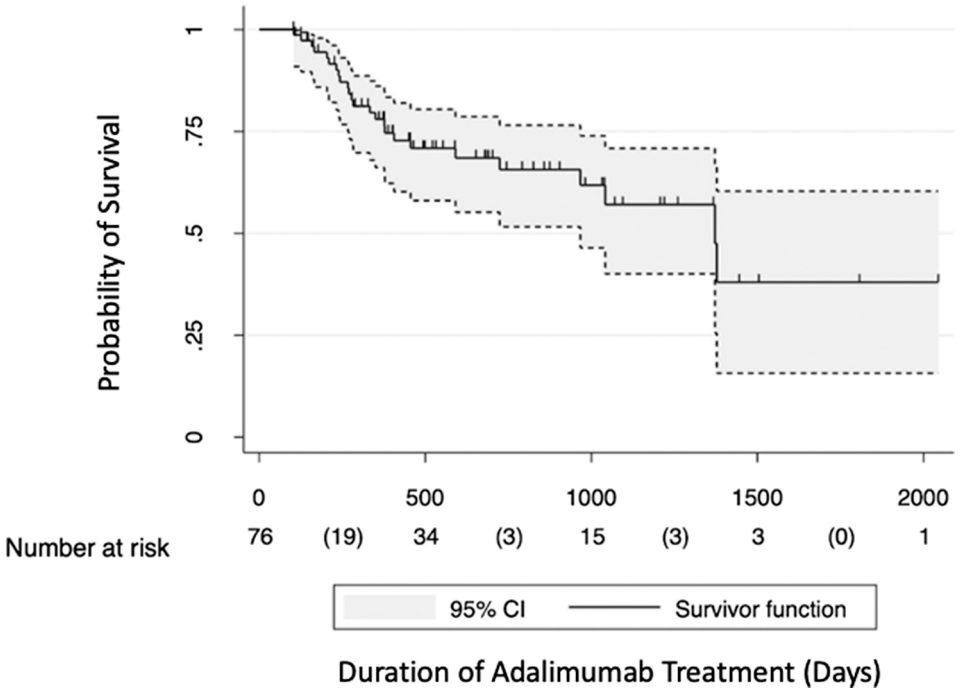

Fig 1. Cumulative survival function of patients on adalimumab. Graph shows discontinuation due to any cause, with the number at risk for each 500 days, and the number indicating the number who discontinued during the respective time interval. Tick marks indicate patients that have been censored, and censoring occurred primarily due to limited duration of follow-up without treatment discontinuation. *CI*, Confidence interval.

Few studies have evaluated real-world adalimumab experiences since United States Food and Drug Administration approval in March 2015.[3,4] In this study, we evaluated 95 patients with HS treated with adalimumab at the University of Pittsburgh Medical Center to characterize drug survival, treatment failures, and secondary treatments.

This retrospective review characterizes patients with HS aged 18 years and older prescribed adalimumab for at least 3 months at University of Pittsburgh Medical Center from August 2015 to January 2020. Medical records were reviewed at the start of adalimumab therapy for demographic data, body mass index, smoking status, history of inflammatory bowel disease (IBD), Hurley stage, affected anatomic area, fistula presence, history of surgical therapy, and prior medical therapies. In addition, we recorded adalimumab treatment duration, therapy delay, dosing regimen, insurance status, and secondary treatments once adalimumab was discontinued. Patients with weekly dosing of 40 mg adalimumab were included because we assumed that patients with or without a loading dose would have a steady state of adalimumab given its half-life of 2 weeks. The *t* test, Wilcoxon signed rank test, and Pearson χ^2 test were used to compare between groups in normally, nonparametric, and categorical variables, respectively.

In this review, 95 patients with HS were treated with adalimumab, and only 76 patients were treated with maintenance dosing of 40 mg weekly for an average of 581 days. Excluded from the study were 19 patients who were treated with maintenance dosing of every other week because the appropriate dosing regimen for patients with HS is once weekly. Of 76 patients, 25 discontinued adalimumab (Supplemental Table I, available via Mendeley at https://doi.org/10.17632/pfz95dbvgm.1) due to lack of therapeutic improvement (16 of 25 [64.0%]) and adverse effects (7 of 25 [28%]).

Fig 1 demonstrates the probability of drug survival over time, with a median probability of 74.1% at 454 days. Patients with history of IBD were more likely to experience treatment success (10 of 10 [100%]) compared with treatment cessation (0 of 10 [0%]; $P = .018$) (Table I). In addition, scalp and/or face involvement, with concomitant intertriginous lesions supportive of HS, were associated with treatment cessation (6 of 7 [85.7%]) as opposed to treatment success (1 of 7 [14.3%]; $P = .002$).

No significant associations were found between adalimumab continuation and demographic data, presence of fistulas, body mass index, smoking

Table I. Baseline characteristics and adalimumab survival

Variable*	Study cohort (N = 76)			*P* value
	Overall (N = 76)	Drug survival (n = 51)	Drug cessation (n = 25)	
Baseline characteristics				
Age, y	32.8 ± 14.3	32.6 ± 14.2	33.1 ± 15.0	.885
Sex				.091
Female	55 (72.4)	40 (78.4)	15 (60.0)	
Male	21 (27.6)	11 (21.6)	10 (40.0)	
Race/ethnicity				.083
White	51 (67.1)	38 (74.5)	13 (52.0)	
Black or African American	20 (26.3)	9 (17.6)	11 (44.0)	
Hispanic	3 (4.0)	2 (3.9)	1 (4.0)	
Unknown	2 (2.6)	2 (3.9)	0 (0)	
Insurance status				
Medicare	14 (18.4)			
Medicaid	32 (42.1)			
Commercial	30 (39.5)			
Duration, d	613.8 ± 449.2	670.4 ± 452.6	498.4 ± 428.1	.05
Range	96-2033	96-2033	104-1574	
Delay in therapy, d	946.1 ± 915.4	967.6 ± 892.2	904.1 ± 976.8	.427
Body mass index, kg/m^2	35.0 ± 10.2	35.5 ± 7.7	34.2 ± 10.2	.542
Smoking status				
Yes	43 (56.6)	26 (51.0)	17 (68.0)	.164
No	33 (43.4)	25 (49.0)	8 (32.0)	
History of IBD				
Yes	10 (13.2)	10 (19.6)	0 (0)	.018
No	66 (86.8)	41 (80.4)	25 (100)	
Hurley stage				.493
Stage 1	2 (2.6)	2 (3.9)	0 (0)	
Stage 2	9 (11.8)	6 (11.8)	3 (12.0)	
Stage 3	10 (13.2)	5 (9.8)	5 (20.0)	
Unknown	55 (72.4)	38 (74.5)	17 (68.0)	
Anatomic area affected				
Scalp/face	7 (9.2)	1 (2.0)	6 (24.0)	.002
Chest/back/abdomen	32 (42.1)	22 (43.1)	10 (40.0)	.795
Buttock/perianal/groin	61 (81.3)	42 (82.4)	19 (76.0)	.513
Lower extremities	15 (19.7)	9 (17.6)	6 (24.0)	.513
Axilla	53 (69.7)	35 (68.6)	18 (72.0)	.764
Presence of fistula				.248
Yes	51 (67.1)	32 (62.8)	19 (76.0)	
No	25 (32.9)	19 (37.2)	6 (24.0)	
History of surgical therapy				
Yes	17 (22.4)	11 (21.2)	6 (24.0)	.811
No	59 (77.6)	40 (78.4)	19 (76.0)	
Adalimumab dosing†				.232
Regimen 1	52 (68.4)	38 (74.5)	14 (56.0)	
Regimen 2	14 (18.4)	7 (13.7)	7 (28.0)	
Regimen 3	10 (13.2)	6 (11.8)	4 (16.0)	

IBD, Inflammatory bowel disease.
*Categorical data are presented as n (%) and continuous data as mean ± standard deviation.
†Adalimumab dosing regimens: 1 = 160 mg, 80 mg week 2, 40 mg weekly; 2 = 80 mg, then 40 mg weekly; 3 = 40 mg weekly.

status, Hurley stage, prior surgical therapy, prior oral or systemic therapies, or treatment with a loading dose. Lastly, 5 of 24 patients who discontinued adalimumab had improvement of their HS, as documented by the treating provider, with therapies including secukinumab with oral metronidazole and topical clindamycin/chlorhexidine, infliximab with prednisone and doxycycline, infliximab, abatacept

with prednisone and methotrexate, and prednisone (Supplemental Table II).

Limitations of this study include the retrospective design as well as limited sample size at a single institution.

In summary, our study characterizes adalimumab drug survival in HS and shows that a history of IBD is associated with treatment continuation, whereas scalp and/or face involvement are more likely to result in discontinuation. Of the 95 patients, 19 (20.0%) were treated without weekly dosing of adalimumab. Future studies should evaluate whether the pathogenesis of IBD allows for increased adalimumab efficacy or whether patients stay on the medication longer due to better IBD control.

We hope this study will help in selecting patients with HS who will respond to adalimumab, increase awareness of proper HS adalimumab dosing, and assist physicians in choosing secondary treatments.

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Conflicts of interest

None disclosed.

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Seroconversion of severe acute respiratory syndrome coronavirus 2–infected patients on immunosuppression: A retrospective analysis

To the Editor: Patients who are taking immunosuppressive drugs are at an increased risk of coronavirus disease 2019 (COVID-19) complications, in part because of the propensity for immunosuppressive medications to interfere with pathogen-specific antibody seroconversion.[1,2] In addition, immunosuppression can theoretically inhibit severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)–specific antibody production, reducing viral clearance and vaccine efficacy. Patients and physicians alike are concerned about balancing the risks and benefits of immunosuppression in the setting of the COVID-19 pandemic. However, there is little evidence to provide guidance regarding seroconversion of patients taking immunosuppressive drugs after SARS-CoV-2 infection. We conducted a retrospective analysis of patients within our institution with polymerase chain reaction (PCR)–confirmed SARS-CoV-2 infection and overlapping immunosuppression to examine the rate of immunoglobulin M (IgM) and immunoglobulin G (IgG) antibody seroconversion.

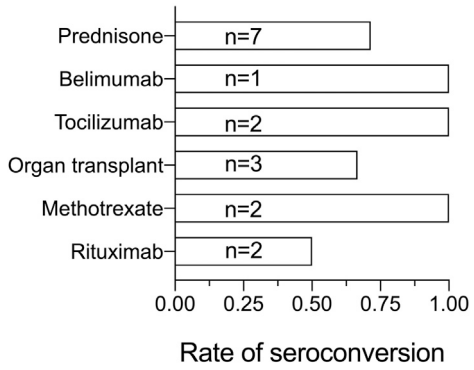

Fig 1. Rate of seroconversion of patients on immunosuppressive therapy. Patients with a polymerase chain reaction–confirmed diagnosis of severe acute respiratory syndrome coronavirus 2 infection, with immunosuppression during a defined 7-day seroconversion window, and with an available serology study ≥7 days after diagnosis are graphed. For patients taking multiple medications, a rank order of immunosuppressant was applied (in descending order: rituximab, belimumab, tocilizumab, prednisone, and methotrexate; see text for details). Solid organ transplant patients received a combination of mycophenolate mofetil and tacrolimus with or without prednisone and are graphed as a separate subgroup. Note that n refers to the number of patients in each category.