
Apremilast for moderate hidradenitis suppurativa: Results of a randomized controlled trial



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Background: Effective anti-inflammatory treatments for hidradenitis suppurativa (HS) are limited.

Objective: To evaluate the efficacy and short-term safety of apremilast in patients with moderate HS.

Methods: A total of 20 patients with moderate HS were randomized in a 3:1 ratio to receive blinded treatment with apremilast, 30 mg twice daily, or placebo for 16 weeks. The primary outcome was the Hidradenitis Suppurativa Clinical Response at week 16. Linear mixed effects modeling (analysis of covariance) was used to assess secondary clinical outcomes between treatment groups.

Results: The HS clinical response was met in 8 of 15 patients in the apremilast group (53.3%) and none of 5 patients in the placebo group (0%) ($P = .055$) at week 16. Moreover, the apremilast-treated patients showed a significantly lower abscess and nodule count (mean difference, -2.6 ; 95% confidence interval, -6.0 to -0.9 ; $P = .011$), NRS for pain (mean difference, -2.7 ; 95% -4.5 to -0.9 ; $P = .009$), and itch (mean difference, -2.8 ; 95% confidence interval, -5.0 to -0.6 ; $P = .015$) over 16 weeks compared with the placebo-treated patients. There was no significant difference in the Dermatology Life Quality Index over time between the 2 treatment groups (mean difference, -3.4 ; 95% confidence interval, -9.0 to 2.3 ; $P = .230$). The most frequently reported adverse events in the apremilast-treated patients were mild-to-moderate headache and gastrointestinal symptoms, which did not result in dropouts.

Limitations: Small number of patients, relatively short study duration.

Conclusion: Apremilast, at a dose of 30 mg twice daily, demonstrated clinically meaningful efficacy and was generally well tolerated in patients with moderate HS. (J Am Acad Dermatol 2019;80:80-8.)

Key words: acne inversa; efficacy; PDE4; phosphodiesterase 4 inhibitor; randomized controlled trial; safety; tolerability; treatment.

Hidradenitis suppurativa (HS) is a chronic, recurrent, autoinflammatory skin disorder with an estimated prevalence of approximately 1% of the general population.¹ The disease

occurs more frequently in females and usually presents during adolescence with painful, itchy, deep-seated, inflamed nodules, abscesses, and sinus tracts predominantly in the axillae and inguinal and

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anogenital regions.^{1,2} Disease severity can be categorized into 6 stages, ranging from clear (stage 0) to very severe (stage 6) according to the Hidradenitis Suppurativa Physician's Global Assessment (HS-PGA).³ HS may progress over time, supporting the need for early intervention.

Currently, first-line therapies for moderate HS include anti-inflammatory oral antibiotics such as the tetracyclines and the combination of clindamycin and rifampicin.⁴ Second-line treatment includes adalimumab, which is the only registered treatment for moderate-to-severe HS that provides clinically meaningful improvements.⁵ Other biologic therapies have not been extensively studied in patients who have HS or are currently in the early stages of its clinical development.⁶ Taken together, the high-quality evidence on HS treatment is limited, highlighting a significant unmet need for novel effective anti-inflammatory therapies.

Recently, in a small case series, 5 of 6 patients with moderate-to-severe HS treated with apremilast, 30 mg twice daily for 3 months, showed a promising response.⁷ In addition, the clinical efficacy of apremilast for patients with moderate-to-severe psoriasis and psoriatic arthritis has previously been proved in multiple clinical trials.⁸⁻¹⁰ Apremilast is an orally administered small molecule drug that specifically inhibits phosphodiesterase 4 and modulates the expression of a variety of proinflammatory and anti-inflammatory mediators.¹¹⁻¹³ As apremilast targets phosphodiesterase 4 in several inflammatory cell types involved in the pathogenesis of HS, such as T cells, natural killer cells, neutrophils, monocytes, and dendritic cells, we hypothesized that it might have a beneficial effect in patients with HS.

The objective of this double-blind randomized placebo-controlled trial was to investigate the clinical efficacy and short-term safety and tolerability of apremilast in patients with moderate HS and to evaluate the mode of action of apremilast in HS. We specifically chose a study population with moderate HS because the clinical efficacy of apremilast in psoriasis (as measured by reaching a 90% improvement in baseline Psoriasis Area Severity Index score) is lower than that of most anti-tumor necrosis factor- α agents and certainly lower than that of the recently

introduced anti-interleukin 17 agents and anti-interleukin 23p19 biologics.¹⁴

MATERIAL AND METHODS

Patients

Patients who were at least 18 years of age with moderate HS, defined as a HS-PGA score of 3, were enrolled. Additionally, patients were required to have at least 4 inflammatory lesions (ie, abscesses, draining sinuses/tunnels, or inflammatory nodules in at least 2 anatomic locations). Patients receiving systemic antibiotics or immunosuppressive/immunomodulating therapy were required to stop treatment at least 28 days before baseline and until the end of study. Patients were excluded if they had minimal, mild, severe, or very severe disease severity according to the HS-PGA scale; any clinically significant active systemic dis-

ease or infection; a diagnosis of or suspected Crohn's disease; a history of major psychiatric illness requiring hospitalization within the past 3 years; a malignancy or history of malignancy (except for treated basal or squamous cell skin carcinoma or early forms of cervical carcinoma with no recurrence in 5 years); open wounds remaining after surgical treatment; prior treatment with apremilast; or a contraindication for apremilast.

Screening

Once a patient was considered eligible for the study, the following screening procedures were performed: (1) medical history and physical examination; (2) chest radiograph; (3) serologic testing for HIV, hepatitis B and C virus, tuberculosis (QuantiFERON) and (in women) a serum pregnancy test; and (4) clinical laboratory analysis to determine hemoglobin level, white blood cell count, absolute neutrophil count, platelet count, serum creatinine level, alanine aminotransferase level, and alkaline phosphatase level.

Study design

This study was an investigator-initiated clinical trial (EudraCT 2016-000859-27; NCT03238469) that was conducted in the department of Dermatology of the Erasmus University Medical Center Rotterdam, The Netherlands, approved by the local medical

CAPSULE SUMMARY

- Apremilast is a small molecule drug that inhibits phosphodiesterase 4 in important inflammatory cells and modulates the expression of several inflammatory cytokines.
- Apremilast, 30 mg twice daily for 16 weeks, improves moderate hidradenitis suppurativa with a good short-term safety profile.
- Apremilast is a promising new treatment modality for hidradenitis suppurativa; larger clinical studies are warranted.

Abbreviations used:

AE:	adverse event
AN:	abscess and inflammatory nodule
DLQI:	Dermatology Life Quality Index
HiSCR:	Hidradenitis Suppurativa Clinical Response
HS:	hidradenitis suppurativa
HS-PGA:	Hidradenitis Suppurativa Physician's Global Assessment
NRS:	numeric rating scale

ethics committee (NL.57003.078.16), and implemented according to the Declaration of Helsinki principles. All patients provided written informed consent before enrollment.

Eligible patients were randomly assigned to treatment with apremilast at a dose of 30 mg twice daily ($n = 15$) or placebo tablets with an appearance, packaging, and labeling identical to that of apremilast ($n = 5$). An independent statistician generated the randomization scheme on the basis of the anticipated group size with a ratio of 3 to 1 by using R Statistical Software (R Foundation for Statistical Computing, Vienna, Austria). Treatment was allocated by using the sequential randomization code provided and guarded by the trial pharmacist. Patients, care providers, and those assessing the outcomes were blinded to treatment allocation. Apremilast was dose-escalated over the first week of treatment (10 mg on day 1, with increases of 10 mg/d) until the target dose of 30 mg twice daily had been reached. The duration of the treatment period was 16 weeks. Study visits were scheduled for screening and at week 0 (baseline), week 2, week 4

(early response), week 8, week 12, and week 16 (end of study).

Outcome measures

The primary outcome was the percentage of patients reaching the Hidradenitis Suppurativa Clinical Response (HiSCR) at week 16, which was defined as at least a 50% reduction in total abscess and inflammatory nodule (AN) count, with no increase in abscess count and no increase in draining sinus count relative to baseline.^{15,16} At every visit, a physical examination (including a lesion count) was performed.

Secondary clinical outcomes included the HiSCR at week 4, total lesion count, AN count, and Dermatology Life Quality Index (DLQI) score¹⁷; the patient's assessment of pain, itch, and disease burden on a numeric rating scale (NRS) ranging from 0 (no itch, pain, or burden) to 10 (unbearable/extreme itch, pain, and/or burden); and clinical photographs. Both physician-reported outcomes and patient-reported outcomes were collected at all visits. Safety assessments were conducted from screening until the end of the study. Adverse events (AEs) and vital signs were evaluated at each visit, and clinical laboratory measurements were evaluated at weeks 2, 8, and 16.

Statistical analyses

No statistical sample size was calculated.¹⁸ Sample size estimations were based on previous exploratory clinical trials in HS.^{19,20} Clinical efficacy and safety outcomes were analyzed in the intention-to-treat population according to the randomized group assignments. The proportion of patients achieving

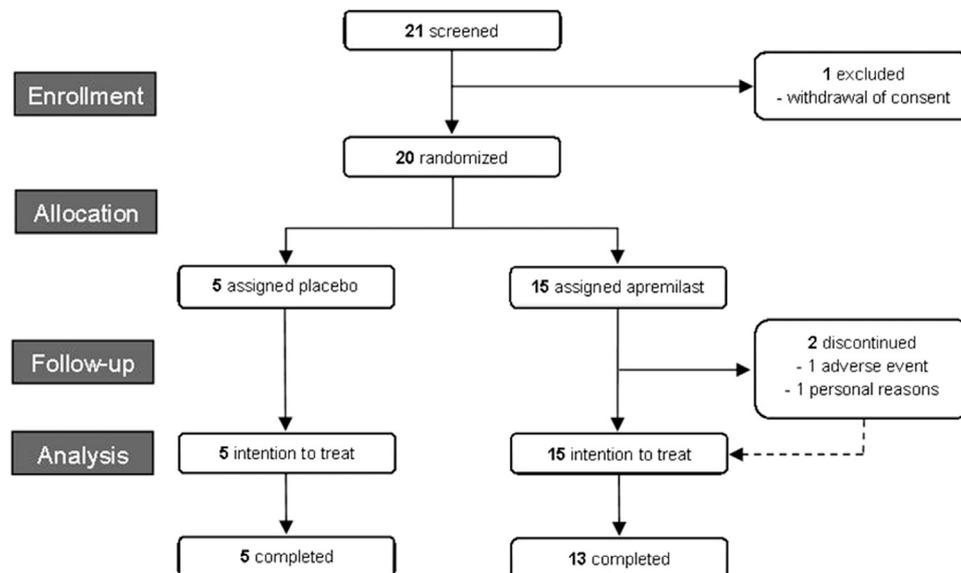


Fig 1. Flowchart of patient enrollment and the study procedure.

Table I. Baseline characteristics

Characteristic	Apremilast (n = 15)	Placebo (n = 5)
Mean age ± SD, y	35.7 ± 13.0	33.4 ± 8.2
Women, n (%)	12 (80)	5 (100%)
Race, white, n (%)	15 (100)	4 (80)
Mean history of HS ± SD, y	21.6 ± 13.0	16.0 ± 7.1
Prior treatment of HS with an antibiotic, n (%)	13 (87)	4 (80)
Prior treatment of HS with a biologic, n (%)	4 (27)	2 (40)
Mean BMI ± SD, kg/m ²	32.7 ± 6.7	32.8 ± 5.3
Current smokers, n (%)	11 (73)	5 (100)
Mean current daily cigarette consumption ± SD	17.7 ± 8.2	19.6 ± 11.4
Mean total lesion count ± SD*	6.9 ± 2.3	7.2 ± 2.6
Mean AN count ± SD [†]	6.1 ± 1.7	5.8 ± 2.4
Mean DLQI score ± SD (0-30)	14.6 ± 7.6	11.8 ± 5.9
Mean NRS score for pain ± SD (0-10)	6.4 ± 2.4	5.8 ± 2.2
Mean NRS score for itch ± SD (0-10)	5.0 ± 2.9	6.8 ± 3.0
Mean NRS score for disease burden ± SD (0-10)	6.2 ± 2.1	7.0 ± 3.0

AN, Abscess and inflammatory nodule; BMI, body mass index; DLQI, Dermatology Life Quality Index; HS, hidradenitis suppurativa; NRS, numeric rating scale; SD, standard deviation.

*Total number of abscesses, draining sinuses/tunnels, and inflammatory nodules.

[†]Total number of abscesses and inflammatory nodules.

HiSCR was analyzed by Fisher's exact test at week 4 and week 16 (primary outcome). Missing outcomes in terms of the HiSCR of 2 patients at week 16 were imputed by last observation carried forward. To assess response over 16 weeks of treatment, the total lesion count, AN count, and DLQI score, as well as the patient's global assessment on pain, itch, and disease burden, were analyzed by linear mixed effects modeling using analysis of covariance with the fixed factor treatment*time, the baseline value as covariate, and first-order autoregressive as best fitting covariance structure. Exactly the same model was subsequently used to separately evaluate the treatment arms relative to baseline for an impression of the short-term (week 4) and final response to treatment (end of the study [week 16]). Secondary outcomes were not statistically compared at time points to increase the power. Missing data for the analysis of covariance modeling were not imputed, nor were they carried forward. Post hoc analysis did not show significant differences between the approach of no data imputation and the approach of last observation carried forward. Safety data were analyzed by descriptive statistics for all patients who received at least 1 dose of the study drug. Statistical analyses were conducted with SPSS Statistics 24.0 (IBM Corporation, Armonk, NY). A 2-sided *P* value less than .05 was considered significant.

RESULTS

Patients

Enrollment occurred between February and August 2017, and a 16-week follow-up was

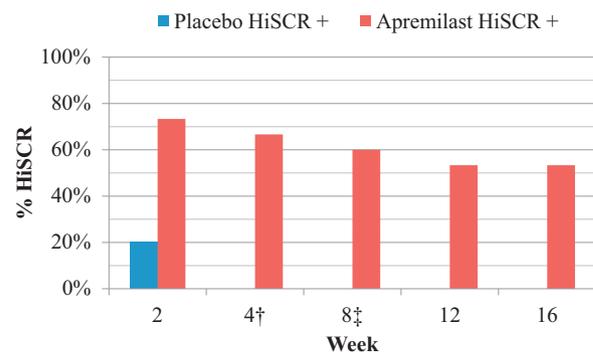


Fig 2. Percentage of patients in both treatment groups reaching the Hidradenitis Suppurativa Clinical Response (HiSCR) relative to baseline during the treatment period. Fisher's exact test was performed at week 4 (*P* = .033) and at week 16 (*P* = .055). [†]Last observation carried forward for 1 HiSCR nonachiever as a result of dropping out. [‡]Last observation carried forward for 1 HiSCR achiever as a result of dropping out.

completed in December 2017. In total, 21 patients were randomized, of whom 20 received at least 1 dose of study medication and were included in the intention-to-treat population. Of these, 18 (90%) completed the week 16 follow-up visit (Fig 1). Of the 15 patients receiving apremilast, 2 (13%) discontinued the study: 1 patient discontinued between week 4 and week 8 because of personal circumstances (travel distance in combination with divorced parents), and the other discontinued at week 8 on account of adverse effects. None of the 5 patients in the placebo arm dropped out. The



Fig 3. Example of a patient in the apremilast treatment group: baseline (*left*), at week 4 (early response) (*middle*), and at week 16 (end of study) (*right*). Arrows indicate index lesions (ie, inflammatory nodules that were larger than 10 mm in diameter and painful by palpation at baseline). Note that all the deep-seated lesions have resolved. Erythematous lesions seen at week 16 are scars and superficial folliculitis.

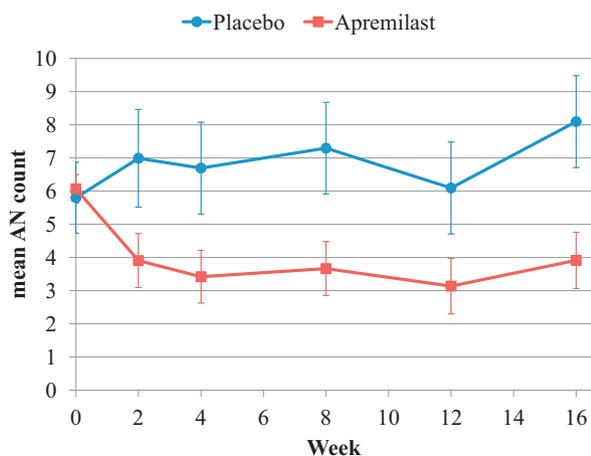


Fig 4. Mean estimated abscess and inflammatory nodule (AN) count from baseline until week 16 according to linear mixed effects modeling (analysis of covariance). (Mean estimated difference for apremilast vs placebo, -2.6 ; 95% confidence interval, -6.0 to -0.9 ; $P = .011$.) AN count is the total number of abscesses and inflammatory nodules. Bars display standard errors of the mean.

baseline characteristics for the intervention groups are depicted in [Table I](#).

Primary efficacy outcome

Of the 15 patients allocated to treatment with apremilast, 8 (53.3%) achieved a positive HiSCR at week 16 compared with none of the patients in the placebo group ($P = .055$) ([Fig 2](#)). The last observation was carried forward for the dropout after week 4

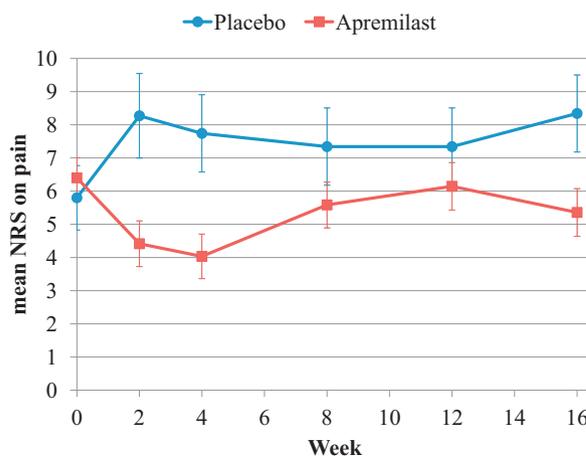


Fig 5. Mean estimated level of pain from baseline until week 16 according to linear mixed effects modeling (analysis of covariance). (Mean estimated difference for apremilast vs placebo, -2.7 ; 95% confidence interval, -4.5 to -0.9 ; $P = .009$.) NRS, Numeric rating scale. Bars display standard errors of the mean.

(negative HiSCR) and the dropout at week 8 (positive HiSCR). At week 4, 10 of 15 patients receiving apremilast (66.7%) achieved a positive HiSCR versus none of the patients in the placebo group ($P = .033$). A decrease in the proportion of patients treated with apremilast who achieved an HiSCR was observed from week 2 (an HiSCR in 11 of 15 patients) with a stabilization between week 12 and 16 (an HiSCR in 8 of 15 patients). A characteristic example of the

Table II. Mean estimated change from baseline for treatment outcomes at week 4 and week 16

Characteristic	Apremilast* (n = 15)	Placebo* (n = 5)
Week 4		
Total lesion count [†]	-2.8 (-4.6 to -1.1)	-0.4 (-3.5 to 2.6)
AN count [‡]	-2.7 (-4.3 to -1.1)	+0.6 (-2.2 to 3.4)
DLQI (0-30)	-3.8 (-7.2 to -0.4)	+0.8 (-5.1 to 6.7)
NRS for pain (0-10)	-2.1 (-3.5 to -0.8)	+1.6 (-0.7 to 3.9)
NRS for itch (0-10)	-0.7 (-2.0 to 0.6)	+2.0 (-0.3 to 4.3)
NRS for disease burden (0-10)	-1.8 (-3.0 to -0.6)	+1.1 (-1.0 to 3.2)
Week 16		
Total lesion count [†]	-2.0 (-3.9 to -0.2)	+1.4 (-1.7 to 4.4)
AN count [‡]	-2.2 (-3.9 to -0.5)	+2.0 (-0.8 to 4.8)
DLQI (0-30)	-2.3 (-5.9 to 1.3)	+4.2 (-1.7 to 10.1)
NRS for pain (0-10)	-0.8 (-2.2 to 0.6)	+2.2 (-0.1 to 4.5)
NRS for itch (0-10)	-1.1 (-2.5 to 0.3)	+2.4 (0.1 to 4.7)
NRS for disease burden (0-10)	-1.0 (-2.3 to 0.3)	+0.9 (-1.2 to 3.0)

AN, Abscess and inflammatory nodule; DLQI, Dermatology Life Quality Index; NRS, numeric rating scale.

*Mean estimated change from baseline at week 4 and week 16 for with corresponding 95% confidence intervals for outcome values according to linear mixed effects modeling (analysis of covariance).

[†]Total number of abscesses, draining sinuses/tunnels, and inflammatory nodules.

[‡]Total number of abscesses and inflammatory nodules.

clinical response of a patient treated with apremilast is provided in Fig 3.

Secondary efficacy outcomes

Over 16 weeks of treatment, the patients receiving apremilast showed a significantly lower AN count (mean difference, -2.6; 95% confidence interval, -6.0 to -0.9; $P = .011$) (Fig 4) and significantly lower NRS scores for pain (mean difference, -2.7; 95% confidence interval, -4.5 to -0.9; $P = .009$) (Fig 5), itch (mean difference, -2.8; 95% confidence interval, -5.0 to -0.6; $P = .015$), and disease burden (mean difference, -1.8; 95% confidence interval, -3.7 to -0.01; $P = .049$) than did patients in the placebo group. The total lesion count demonstrated a trend toward significant improvement in the apremilast group (mean difference, -2.6; 95% confidence interval, -5.5 to 0.2; $P = .064$). There were no differences in DLQI score over time between the treatment groups (mean difference, -3.4; 95% confidence interval, -9.0 to 2.3; $P = .230$).

The mean changes from baseline by treatment group for the secondary clinical outcomes at week 4 (early response) and week 16 (end of study) are summarized in Table II. In the apremilast group the treatment outcomes observed at week 16 did not further improve as compared with those at week 4 except for itch. In the placebo group all outcomes except the NRS for disease burden deteriorated at the end of study relative to week 4.

Safety and tolerability

In total, 38 AEs were reported in the apremilast group versus 11 AEs in the placebo group ($P = .514$). An overview of the AEs is shown in Table III. Most of the AEs were mild to moderate, and none was classified as a serious AE. One patient in the apremilast group discontinued study participation because of unbearable muscle and joint pain that occurred a few days after the first dose of study medication. A poststudy exploratory genetic analysis of cytochrome P450 family 3 subfamily A member 4 gene (*CYP3A4*) and cytochrome P450 family 1 subfamily A member 2 (*CYP1A2*) polymorphisms, which are important for the metabolism of apremilast, showed normal expression in this patient, implying that differential metabolism could not explain the AE. In all, 6 patients in the apremilast group versus 2 patients in the placebo group had ongoing AEs at the end of the study. The ongoing AEs in the patients receiving apremilast after 16 weeks were diarrhea ($n = 2$), headache, nonspecific rash, increased fatigue, and a depressed feeling. At telephone follow-up 8 weeks after the end of study, these events were resolved without sequelae. There were no clinically significant changes in laboratory parameters.

DISCUSSION

The main finding from this study was a clinically meaningful improvement of moderate HS after treatment with apremilast at a dose of 30 mg twice

Table III. Adverse events

Characteristic	Apremilast, n (%) E* (n = 15)	Placebo, n (%) E* (n = 5)
Headache	7 (47) 8	1 (20) 2
Diarrhea	7 (47) 7	1 (20) 1
Nausea	4 (36) 4	1 (20) 1
Common cold	4 (36) 4	1 (20) 1
Vomiting	2 (13) 2	0 (0) 0
Nonspecific rash	2 (13) 2	0 (0) 0
Excessive joint and muscle pain	1 (7) 1 [†]	0 (0) 0
Back pain	1 (7) 1	0 (0) 0
Increased fatigue	1 (7) 1	0 (0) 0
Depressed feeling	1 (7) 1	0 (0) 0
Pyelonephritis	1 (7) 1	0 (0) 0
Mycosis of the vulva	1 (7) 1	0 (0) 0
Increased itch	1 (7) 1	0 (0) 0
Sore throat	1 (7) 1	0 (0) 0
Elevation in serum ALT level [‡]	1 (7) 1	0 (0) 0
Decrease in serum hemoglobin level [§]	1 (7) 1	1 (20) 1
Nonspecific gastrointestinal symptoms	1 (7) 1	1 (20) 1
Dry mouth	0 (0) 0	1 (20) 1
Hair loss	0 (0) 0	1 (20) 1
Self-reported fever of unknown origin	0 (0) 0	1 (20) 1
Flare of herpes labialis	0 (0) 0	1 (20) 1

ALT, Alanine transaminase.

*Number of patients with at least 1 adverse event (n), percentage of patients with at least 1 adverse event (%), and number of adverse events (E).

[†]Reason for dropping out.

[‡]Self-limiting elevation equal to 2 to 3 times the upper limit.

[§]Below the lower limit according to the local laboratory threshold.

per day for 16 weeks. Apremilast significantly decreased disease activity as measured by the AN count, and 53.3% of patients receiving apremilast achieved the HiSCR in comparison with none of the patients receiving placebo. In addition, apremilast for 16 weeks was well tolerated by patients with moderate HS. According to the study protocol, the objective was to also evaluate the mode of action of apremilast in HS by measuring the expression of inflammatory cytokines in the lesional skin at weeks 4 and 16. However, the data are still being analyzed, and the translational results will therefore be published separately.

The response to treatment in this study was evaluated primarily by the HiSCR.¹⁵ This validated efficacy end point has previously been used in 4 randomized controlled trials in HS.^{5,16,21} The proportion of HiSCR responders in our study is within the range of HiSCR achievers in these previous studies: consecutively, 54.5% (adalimumab every week during 16 weeks of treatment [N = 147, of

whom 43 received placebo]), 41.8% ([PIONEER I] adalimumab every week during 12 weeks of treatment (N = 307, of whom 154 received placebo)), 58.9% ([PIONEER II] adalimumab every week during 12 weeks of treatment [N = 326, of whom 163 received placebo]), and 60.0% (the monoclonal antibody MABp1 every other week during 12 weeks of treatment [N = 20, of whom 10 received placebo]). Of note, in these trials patients with moderate-to-severe HS were enrolled and 3 of 4 studies were larger. Although a 1-to-1 comparison is inappropriate, the aforementioned results demonstrate that our findings are in line with the currently reported response rates.

Interestingly, the time to clinical response was much faster than that with apremilast in psoriasis, in which case an increasing proportion of patients achieving a 75% improvement in baseline Psoriasis Area Severity Index score has been observed up to 52 weeks after start of treatment.²² This might potentially be explained by differences in underlying pharmacodynamic patterns, as HS autoinflammatory pathology is initiated by an aberrant innate immune response followed by participation of the adaptive immune system that involves a broader array of cell types than in psoriasis pathophysiology.

Patients' assessment of HS-related pain and itch fluctuated during treatment, possibly reflecting the natural course of the disease, as the AN count does not take into account the size or severity of individual lesions. The DLQI score improved in the apremilast-treated patients but exhibited even larger variability during the study. An explanation might be the small number of patients studied and the fact that quality of life could have been affected by other (personal) circumstances in addition to the HS disease activity.

Treatment with apremilast at a dose of 30 mg twice daily was generally well tolerated, with the majority of the AEs rated mild to moderate. In summary, the safety profile of apremilast observed in this study is consistent with previous findings from larger trials in patients with psoriasis and psoriatic arthritis.^{23,24} However, the number of patients included in our study was small, and the current safety results may not be representative for a larger population.

The evidence-based literature available on non-biologic therapies in HS is limited and largely restricted to retrospective studies or expert opinion.⁴ Therefore, recommendations for optimal medical management of HS are challenging. Although the efficacy of apremilast in HS must still be confirmed in larger studies, we believe that apremilast could be considered as a new treatment option for moderate HS after failure of conventional

treatments, such as the combination of clindamycin and rifampicin. Currently, adalimumab is the first-choice agent in moderate-to-severe HS after failure of conventional treatments.⁵ However, there may be advantages of apremilast over oral antibiotics and biologic therapies. It is well established that continuous antibiotic treatment can induce bacterial resistance, limiting its use for chronic purposes, whereas subcutaneous administration and relatively frequent laboratory monitoring can pose an additional burden for patients who are treated with adalimumab. Another problem with the use of tumor necrosis factor- α antagonists such as adalimumab and infliximab is the risk of formation of antidrug antibodies, with neutralization of the therapeutic effect over time.²⁵

The major strength of this study is its randomized, double-blind, placebo-controlled design. In addition, the risk of inter-rater variability for the physician-reported outcomes was minimized by using only 2 clinical assessors. Limitations of our study are the small number of included patients, the study's relatively short duration, and the lack of data beyond the end of treatment. Missing HiSCR data were handled by using last observation carried forward in 2 patients taking apremilast, which potentially increased the effect of attrition bias. Furthermore, the AEs headache, diarrhea, nausea, and vomiting were common in the apremilast group, which could have partially unblinded the observers.

In conclusion, the results from this study indicate that oral apremilast is a promising treatment option with good short-term safety and tolerability and that it could be a valuable addition to the armamentarium for the treatment of HS. Studies with larger populations and longer follow-up are needed to further elucidate the efficacy and safety profile of apremilast in HS.

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