Table I. Pooled multivariate analysis of association of atopic dermatitis with osteoporosis and osteopenia in 2006-2012 Nationwide Emergency Department Sample and 2002-2012 Nationwide Inpatient Sample

		Atopic dermatitis						
		National Emergency Department Sample				Nationwide Inpatient Sample			
Variable	Age, y	No, n (%)	Yes, n (%)	aOR (95% CI)	*P* value	No, n (%)	Yes, n (%)	aOR (95% CI)	*P* value
Osteoporosis	≥50	1,537,839 (2.52)	236 (2.57)	1.31 (1.12-1.54)	**.0008**	2,113,599 (5.05)	164,872 (6.38)	1.25 (1.24-1.26)	**<.0001**
Osteopenia	≥50	264,851 (0.43)	64 (0.70)	1.86 (1.36-2.55)	**.0001**	2255 (0.01)	133 (0.01)	0.86 (0.71-1.04)	.1121
Osteoporosis	≥70	1,173,036 (4.64)	163 (5.91)	1.37 (1.12-1.67)	**.0022**	1,644,675 (7.47)	106,765 (10.11)	1.24 (1.22-1.25)	**<.0001**
Osteopenia	≥70	172,510 (0.68)	33 (1.20)	1.84 (1.20-2.82)	**.0052**	992 (0.0045)	53 (0.005)	1.018 (0.75-1.38)	.9082

Values that are statistically significant are in bold.
aOR, Adjusted odds ratio; *CI*, confidence interval.

2. Garg NK, Silverberg JI. Eczema is associated with osteoporosis and fractures in adults: a US population-based study. *J Allergy Clin Immunol*. 2015;135:1085-1087.e2.
3. Wu CY, Lu YY, Lu CC, Su YF, Tsai TH, Wu CH. Osteoporosis in adult patients with atopic dermatitis: a nationwide population-based study. *PLoS One*. 2017;12:e0171667.
4. Aalto-Korte K, Turpeinen M. Bone mineral density in patients with atopic dermatitis. *Br J Dermatol*. 1997;136:172-175.
5. van Velsen SG, Haeck IM, Knol MJ, Lam MG, Bruijnzeel-Koomen CA. Two-year assessment of effect of topical corticosteroids on bone mineral density in adults with moderate to severe atopic dermatitis. *J Am Acad Dermatol*. 2012;66:691-693.

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High prevalence of clinical spondyloarthritis features in patients with hidradenitis suppurativa

To the Editor: Hidradenitis suppurativa (HS) is associated with several comorbidities, including possibly spondyloarthritis.[1] Spondyloarthritis is a group of interrelated chronic autoinflammatory rheumatic conditions.[2] A spondyloarthritis diagnosis is based mainly on the presence of spondyloarthritis features, which includes spinal (axial) features sacroiliitis and spondylitis, peripheral features, such as peripheral arthritis, enthesitis, and dactylitis; and the extra-articular manifestations uveitis, psoriasis, and inflammatory bowel disease.[2] The probability of spondyloarthritis increases with the presence of more spondyloarthritis features.[2]

Two recent studies showed a higher prevalence of spondyloarthritis in the HS population than in the general population (~1%), but the reported prevalence rates have a wide range of 2.3%-28.2%.[2-4]

A cross-sectional study was performed to investigate the prevalence of self-reported clinical spondyloarthritis features in HS patients and to identify patients' characteristics associated with the presence of spondyloarthritis features. A questionnaire was developed on the basis of the Assessment of SpondyloArthritis international Society axial (back pain for ≥3 months, age of onset <45 years) and peripheral (peripheral arthritis, enthesitis, or dactylitis) spondyloarthritis entry classification criteria and other clinical spondyloarthritis features (past or present). When applicable, the spondyloarthritis questions were illustrated with colored prototypical pictures. The questionnaire was sent to all adult patients with a billing code for HS assigned, between 2010 and 2016, by a dermatologist or dermatology resident of 2 Dutch tertiary HS referral centers.

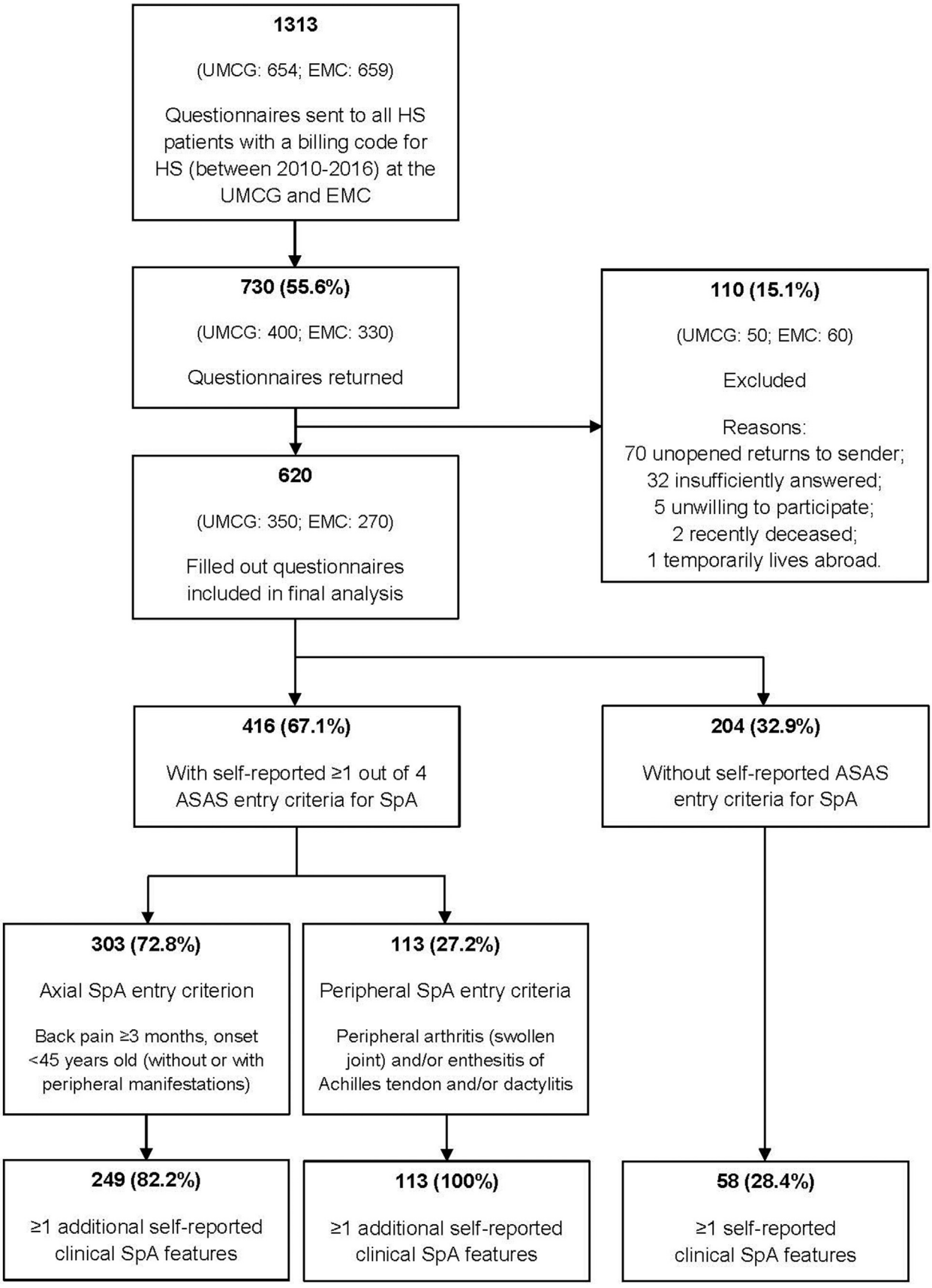

Fig 1. Flowchart showing inclusion and exclusion of questionnaires and self-reported ASAS classification entry criteria for spondyloarthritis in patients with HS. *ASAS*, Assessment of SpondyloArthritis international Society; *EMC*, Erasmus Medical Center; *HS*, hidradenitis suppurativa; *SpA*, spondyloarthritis; *UMCG*, University Medical Center Groningen.

Table I. Prevalence of self-reported spondyloarthritis entry criteria and features in patients with hidradenitis suppurativa

Self-reported spondyloarthritis entry criteria and features	Patients with ≥1 of 4 self-reported ASAS entry criteria for axial and peripheral spondyloarthritis combined,* N = 416, n (%)
No. features in addition to entry criteria†	
0	54 (13.0)
1	137 (32.9)
2	121 (29.1)
3	67 (16.1)
≥4	37 (8.9)
Features	
Inflammatory back pain‡	84 (20.2)
Effect of NSAIDs on back pain	
Good response, ≥50% response	63 (22.0)
No response or <50% response	93 (32.5)
No NSAIDs used	30 (45.5)
Peripheral arthritis, swollen joints	248 (59.6)
Enthesitis, Achilles tendon	66 (15.9)
Dactylitis	83 (20.0)
Uveitis§	13 (3.2)
Psoriasis, including pustulosis palmoplantaris§	39 (9.4)
Inflammatory bowel disease§	31 (7.6)
Crohn's disease	19 (4.7)
Ulcerative colitis	12 (2.9)
Family history of spondyloarthritis in 1st and 2nd degree relatives‖	125 (30.0)

ASAS, Assessment of SpondyloArthritis international Society; *NSAIDs*, nonsteroidal anti-inflammatory drugs.

*ASAS entry criteria for axial spondyloarthritis is back pain for ≥3 months with age of onset <45 years, and criteria for peripheral spondyloarthritis is peripheral arthritis, enthesitis, or dactylitis.

†Inflammatory back pain, inflammatory bowel syndrome, uveitis, psoriasis, good effect of nonsteroidal drugs on back pain, family history of spondyloarthritis, dactylitis, enthesitis of the Achilles tendon, and peripheral arthritis (swollen joint).

‡At least 4 of 5 ASAS criteria for inflammatory back pain needed to be fulfilled: insidious onset, pain at night (with improvement upon getting up), age at onset <40 years, improvement with exercise, and no improvement with rest.

§Self-reported that spondyloarthritis feature was diagnosed by a physician.

‖Family history for spondyloarthritis (ankylosing spondylitis, psoriatic arthritis, psoriasis, uveitis, and inflammatory bowel disease) in 1st and 2nd degree relatives.

No formal informed consent was needed for this type of observational study according to Dutch law, verified at the ethical committee of the University Medical Center Groningen.

Overall, 47.2% (620/1313) of questionnaires were eligible for analysis (Fig 1). Of these, 416 (67.1%) patients self-reported ≥1 of the 4 SpondyloArthritis international Society entry criteria. Entry criteria for axial and peripheral spondyloarthritis were reported by 72.8% and 27.2%, respectively (Fig 1). The large majority (87%) reported ≥1 additional spondyloarthritis feature: 32.9% reported 1 feature, 29.1% 2 features, 16.1% 3 features, and 8.9% ≥4 features (Table I). In comparison with patients without self-reported entry criteria (n = 204), patients with self-reported entry criteria for spondyloarthritis were significantly more frequently female (60.9% vs 74.8%, respectively), had a higher mean body mass index ± standard deviation (26.7 ± 5.3 kg/m^2 vs 28.6 ± 5.9 kg/m^2, respectively), were more often former or current smokers (76.2% vs 87.9%, respectively), had a longer mean HS disease duration ± standard deviation (17.0 ± 12.4 years vs 19.9 ± 12.8 years, respectively), and reported more active HS symptoms at time of the survey (Supplemental Table I; available at http://www.jaad.org).

Based on these results, we argue that HS and spondyloarthritis seem associated, which is in line with previous studies.[3,4] Since >50% of the HS patients reported multiple spondyloarthritis features, the probability of a spondyloarthritis diagnosis is increased. Radiologic signs of spondyloarthritis and the presence of human leukocyte antigen B27 could help to confirm spondyloarthritis.

An association between HS and spondyloarthritis could be explained by a similar pathogenic mechanism: dysregulation of the tumor necrosis factor α, interleukin 1, interleukin 12, interleukin 23, and interleukin 17 immune response pathways.[1,2] Our results contribute to the hypothesis that HS might be an immune-mediated inflammatory disease. This group of seemingly unrelated conditions, including spondyloarthritis and inflammatory bowel disease, might in fact share common inflammatory pathways.[5] Study limitations include the risk for nonresponder bias and recall bias and the self-reporting design.

In summary, self-reported clinical spondyloarthritis features are common in HS patients, especially in the classic HS patient, with active HS symptoms and longer HS disease duration. Physicians should be aware of spondyloarthritis features and the possibility of spondyloarthritis in HS patients.

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REFERENCES

1. Miller IM, McAndrew RJ, Hamzavi I. Prevalence, risk factors, and comorbidities of hidradenitis suppurativa. *Dermatol Clin*. 2016;34(1):7-16.
2. Dougados M, Baeten D. Spondyloarthritis. *Lancet*. 2011; 377(9783):2127-2137.
3. Richette P, Molto A, Viguier M, et al. Hidradenitis suppurativa associated with spondyloarthritis—results from a multicenter national prospective study. *J Rheumatol*. 2014; 41(3):490-494.
4. Fauconier M, Reguiai Z, Barbe C, et al. Association between hidradenitis suppurativa and spondyloarthritis. *Joint Bone Spine*. 2017. pii: S1297-S1319X(17)30164-1.
5. Blandizzi C, Gionchetti P, Armuzzi A, et al. The role of tumour necrosis factor in the pathogenesis of immune-mediated diseases. *Int J Immunopathol Pharmacol*. 2014;27(1_suppl): 1-10.

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Chronic nonmelanoma skin cancers and health-related impairment: A case-control study

To the Editor: Nonmelanoma skin cancer (NMSC) has become an epidemic. The annual incidence of NMSC is estimated to be 5 million, and we spend more than $4.8 billion annually on treatment.[1,2] Our group has proposed that NMSC be considered a chronic disease in a subset of patients, with the goal of developing chronic disease management strategies that focus on prevention.[3] By definition, an illness meets the criteria for a chronic disease if it lasts longer than 1 year, requires ongoing medical care, and/or limits activities of daily living.[4] The purpose of this study was to determine whether patients with 5 or more NMSCs meet the criteria for having a chronic disease.

A 2:1 matched case control study was designed to compare patients with 5 or more NMSCs (excluding genetic cancer syndromes) with patients who have had 1 to 4 NMSCs in their lifetime. A power analysis based on sample variance from the pilot data revealed that 20 patients were needed to detect a significant difference of 15 points in their 20-Item Short Form Health Survey scores.

The cutoff of 5 or more NMSCs was selected on the basis of the clinical experience of our dermatologic surgeon, according to which patients meeting this threshold often continue to develop NMSCs and use our system more extensively, as measured by clinic visits and procedures required to manage their NMSCs. Patients were recruited sequentially from the dermatologic surgery clinics at Keck Medicine of the University of Southern California. Approximately 3% of patients seen for Mohs micrographic surgery in our clinic had 5 or more NMSCs in their lifetime.

In all, 73 patients agreed to participate in the study (survey response rate, 96%); 4 patients had incomplete surveys and could not be used in the analysis. The mean age of the analytic cohort was 69 years, 71% were male, and 96% identified as white (Table I). There were no statistically significant differences in age, sex, or ethnicity. Of the patients with 1 to 4 NMSCs, 27% were immunosuppressed; in contrast, 50% of those with 5 or more NMSCs were immunosuppressed ($P = .08$).

Supplemental Table I. Characteristics of HS patients included in analysis and comparison of patients with and without self-reported spondyloarthritis ASAS classification entry criteria

Characteristic	All analyzed questionnaires, N = 620	With ≥1 of 4 self-reported ASAS classification entry criteria for spondyloarthritis, N = 416	Without self-reported ASAS classification entry criteria for spondyloarthritis, N = 204	*P* value*
Age, years, mean ± SD	43.4 ± 13.9	43.8 ± 13.2	42.5 ± 15.2	.29
Female sex, n (%)	434 (70.2)	311 (74.8)	123 (60.9)	<.001
Age of HS onset, years, mean ± SD	24.0 ± 12.5	23.4 ± 12.2	25.0 ± 13.1	.15
Disease duration of HS, years, mean ± SD	18.9 ± 12.7	19.9 ± 12.8	17.0 ± 12.4	.012
BMI, kg/m^2, n (%)	98 (15.9)	28.6 ± 5.9	26.7 ± 5.3	<.001
Smoking status, n (%)				.001
Nonsmoker	98 (15.9)	50 (12.1)	48 (23.8)	
Former smoker	199 (32.3)	138 (33.3)	61 (30.2)	
Current smoker	319 (51.8)	226 (54.6)	93 (46.0)	
Hurley classification, stage, n (%)				<.001
Not active	146 (24.8)	78 (20.1)	68 (34)	
Hurley I	121 (20.6)	72 (18.6)	47 (12.1)	
Hurley II	271 (46.1)	198 (51.0)	73 (36.5)	
Hurley III	50 (8.5)	38 (9.8)	12 (6.1)	
Refined Hurley classification, stage, n (%)				<.001
Not active	146 (25.0)	78 (20.2)	68 (34.5)	
Refined Hurley IA	33 (5.7)	18 (4.7)	15 (7.6)	
Refined Hurley IB	14 (2.4)	7 (1.8)	7 (3.6)	
Refined Hurley IC	74 (12.7)	49 (12.7)	25 (12.7)	
Refined Hurley IIA	45 (7.7)	29 (7.5)	16 (8.1)	
Refined Hurley IIB	68 (11.7)	45 (11.7)	23 (11.7)	
Refined Hurley IIC	153 (26.2)	122 (31.6)	31 (15.7)	
Refined Hurley III	50 (8.6)	38 (9.8)	12 (6.1)	

Missing data ≥5%: BMI (6.8%), age of HS onset (6.6%), disease duration of HS (6.5%), Hurley classifications stage (5.2%), and refined Hurley classification stage (6.0%).

ASAS, Assessment of SpondyloArthritis international Society; *BMI*, body mass index; *HS*, hidradenitis suppurativa; *SD*, standard deviation.

*With versus without self-reported ASAS classification entry criteria.