

Cross-Sectional Study Evaluating Musculoskeletal Symptoms in Hidradenitis Suppurativa Patients: Prevalence and Associated Factors

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Abstract

Background: The prevalence and factors associated with musculoskeletal (MSK) symptoms in hidradenitis suppurativa (HS) patients have yet to be elucidated. Given the association between HS and inflammatory co-morbidities, understanding the burden of MSK symptoms in HS patients is crucial for patient-centered care.

Objective: Our objective was to describe the prevalence and factors associated with MSK symptoms in HS patients.

Methods: A cross-sectional study of 78 consecutive patients, recruited between November 2021 and February 2023, with a dermatology-confirmed diagnosis of HS, irrespective of MSK symptoms, was performed.

Results: The average age of participants was 37 years, and average age at symptom onset was 23 years. 54% of participants identified as women, and 46% men. The most common comorbidities included depression (22%, N=17) and pre-existing arthritis (16%, N=12). Approximately 24% of participants reported prolonged morning stiffness (N=18). In multivariate regression, depression was significantly associated with morning stiffness (OR: 6.10, P = 0.02; 95% CI: 1.43 to 26.12), while female sex was significantly associated with arthralgia (OR: 19.14; 95% CI: 1.56 to 235.24). Every patient with depression reported arthralgia.

Conclusion: We highlight the high prevalence of MSK symptoms among HS patients and note the interplay between depression and MSK symptoms, with each one potentially contributing to the other.

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Conflicts of Interest: LE has received educational and research grants and consulting fees from Janssen, AbbVie, Pfizer, Novartis, Eli Lilly, UCB, and Sandoz. VP has served as a consultant for Pfizer, AbbVie, Janssen, UCB, Novartis, Almirall, and Celgene; has received honoraria from Kyowa Kirin Co Ltd, AbbVie, and Novartis; has received grants from AbbVie, Bausch Health, Celgene, Janssen, LEO Pharma, Lilly, NAOS, Novartis, Pfizer, Pierre-Fabre, and Sanofi; and has received a donation of medical equipment from La Roche-Posay. RA has served as a consultant and received honoraria from AbbVie, Janssen, Novartis, Incyte, UCB, Pfizer, Amgen, Boehringer Ingelheim. All other authors declare no conflicts of interest.

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ABSTRACT

Background: The prevalence and factors associated with musculoskeletal (MSK) symptoms in hidradenitis suppurativa (HS) patients have yet to be elucidated. Given the association between HS and inflammatory co-morbidities, understanding the burden of MSK symptoms in HS patients is crucial for patient-centered care.

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Conclusion: We highlight the high prevalence of MSK symptoms among HS patients and note the interplay between depression and MSK symptoms, with each one potentially contributing to the other.

Introduction

Hidradenitis suppurativa (HS) is a chronic, suppurating inflammatory condition that characterises the potential link between cutaneous and systemic disease. At present, the underlying pathogenesis of HS is unclear, however a process of follicular occlusion of the folliculopilosebaceous unit, followed by follicular rupture and dysregulated immune response, has been widely proposed[1]. The worldwide prevalence of HS is 1-4% and presents more frequently in women[2].

The inflammatory nature of HS has lent to increasing evidence supporting a link between HS and systemic comorbidities, such as cardiovascular disease (CVD), inflammatory bowel disease (IBD), diabetes mellitus (DM), and depression[1]. Several studies, including a meta-analysis involving over 200,300 HS patients, report a higher prevalence of inflammatory arthritis, including spondyloarthritis and rheumatoid arthritis, in HS patients compared to the general population[3]. The purpose of this study was to investigate the prevalence and factors associated with presence of musculoskeletal (MSK) symptoms in HS patients.

Methods

Patients were recruited between November 2021-February 2023 from one dermatology clinic in a tertiary hospital. Study inclusion criteria was a dermatologist diagnosis of HS, irrespective of MSK symptoms. 106 patients were approached, 18 declined participation and 10 withdrew, for a total of 78 patients in the final analysis. Informed consent was obtained, and patient information was collected via standard questionnaires including age at symptoms, family history, lifestyle habits, length of morning stiffness (minutes), Hurley's stage, presence of arthralgia and comorbidities including depression, DM, IBD, hypertension (HTN) and CVD. A rheumatic disease was investigated with follow-up x-rays, bloodwork, and rheumatology assessment.

Continuous variables were summarized with mean, standard deviation, and minimums/maximums. Categorical variables were summarized using counts and percentages. Independent variables were identified *a-priori* and examined for collinearity with Pearson's rank. Multivariable logistic regression models were built for morning stiffness (defined as: stiffness and reduced mobility in the joints, lasting for more than 30 minutes after waking in the morning) and arthralgia (defined as: joint pain without necessarily implying an underlying inflammatory process). Confounding was assessed by $\geq 10\%$ change on variable removal. Odds ratios (OR) and 95% confidence intervals (CIs) are reported in final models, with statistical significance $p < 0.05$. Analyses were performed with STATA software version 17.0.

Results

Demographics

Seventy-eight patients with HS were included, with a mean age of 37 years at time of study, and 23 years at symptom onset. 54% (42/78) of participants were women, and 46% (36/78) men. Most participants identified as South Asian (N=23), White (N=19), or Black (N=14). Approximately 14% (11/78) had a family history of HS, while 53% (41/78) had a family history of rheumatic disease. The most common comorbidities in participants included depression (N=17) and arthritis (N=12)(Table 1).

Table 1. Baseline Characteristics of 78 Study Participants with Hidradenitis Suppurativa

Variable	N	Proportion (%)	Mean	Standard Deviation	Min	Max
Current Age	78	100.0%	36.949	12.2	19	67
Age at Symptoms	77	98.7%	23.442	12.1	7	60
Age at Diagnosis	78	100.0%	29.603	12.7	12	64
Women	42	53.9%				
Men	36	46.2%				
Ethnicity						

South Asian	23	29.5%
White	19	24.4%
Black	14	18.0%
Other	22	28.2%
Employment Status		
Not working b/c of disability	10	12.8%
Working Full-time	44	56.4%
Other	24	30.8%
Social History		
Current Smoker	16	20.8%
Previous Smoker	6	7.7%
Never Smoked	55	71.4%
Alcohol	77	98.7%
Yes	26	33.8%
No	51	66.2%
Family history of HS		
Yes	11	14.1%
No	67	85.9%
Family History of Rheumatic Disease		
Yes	41	52.56%
No	37	47.44%
Biologic Treatment		
Yes	21	32.8%
No	43	67.2%
Co-morbidities		
Arthritis	12	15.6%
Irritable Bowel Disease	8	10.4%
Diabetes Mellitus	9	11.7%
Hypertension	9	11.7%
Cardiovascular Disease	4	5.2%
Dyslipidemia	1	1.3%
Depression	17	22.1%
HS Disease Severity		
Hurley Stage 1 or 2 (mild, moderate)	60	78.9%
Hurley Stage 3 (severe)	16	21.1%
MSK Symptoms		
>30 min morning stiffness	18	24.0%
<=30 min morning stiffness	57	76.0%
Arthralgia present	41	83.7%
Arthralgia absent	8	16.3%

Inflammatory and MSK Symptoms

Prolonged morning stiffness was reported by 24% of participants (18/78), while majority of

participants reported arthralgia (N=41). In multivariate regression, depression was significantly associated with prolonged morning stiffness (OR:6.1, $P=.015$;CI:1.4-26.1), while female sex was significantly associated with arthralgia (OR:19.1, $P=.02$;CI:1.6-235.2). Every patient with depression reported arthralgia (Table 2).

Table 2. Multivariate Logistic Regressions on 78 participants with Hidradenitis Suppurativa for Symptoms of Prolonged Morning Stiffness >30min and Arthralgia

Multivariate Logistic Regression for Morning Stiffness >30 minutes based on IBD, Biologic Therapy, Hurley Stage Disease, Depression, and Age at Symptoms				
Predictor	Odds Ratio (OR)	Standard Error	p-value	95% CI
Depression	6.10	4.53	.015	1.43-26.12
Inflammatory Bowel Disease	1.08	1.16	.94	0.13-8.86
Biologic Treatment	0.71	0.55	.66	0.16-3.23
Hurley's Stage <3	0.84	0.67	.83	0.17-4.09
Age >25 at Symptom Onset	0.84	0.62	.81	0.20-3.52
Multivariate Logistic Regression for Arthralgia based on IBD^a, Sex, Biologic Therapy, Hurley Stage Disease, Depression^a, and Age at Symptoms				
Female sex	19.14	24.51	.02	1.56-235.24
Biologic Treatment	0.30	0.35	.31	0.30-3.04
Hurley's Stage <3	0.33	0.51	.47	0.17-6.60
Age >25 at Symptom Onset	6.06	8.37	.19	0.41-90.57

^aDepression and IBD were omitted from the table given perfect correlation with predictor.

Discussion

This cross-sectional study including 78 patients with HS demonstrates a significant association between severity of MSK symptoms, depression and female sex. In multivariate analysis, patients with depression had a 6-fold odds of prolonged morning stiffness, while females had 19-fold odds of reporting arthralgia. All patients with depression reported arthralgia.

A correlation between depression and HS has been previously elucidated[4]. The prevalence of depression in our study was 19.2%, comparable to a meta-analysis of 40,307 HS patients reporting a 16.9% prevalence of depression[4]. A large study based on WHO survey data reported 69% of patients with depression present primarily with somatic symptoms, such as joint pain and back

pain[5]. Pro-inflammatory cytokines TNF- α , IL-1 β and IL-10 are elevated in major depressive disorder[6] and HS[7], suggesting a possible pathophysiological process for increased inflammatory symptoms in co-morbid patients. Alternatively, prolonged morning stiffness may contribute to limitations in activities of daily living, such as dressing and getting out of bed, leading to feelings of loss of independence and co-morbid depression[8].

Females were more likely to report arthralgia, which is consistent with population-based research which reports a higher prevalence of chronic MSK pain and pain associated with inflammatory arthritis[9] in females. Still, studies identify that men are more likely to have severe HS disease[10]. Further research into sex-based experiences of MSK symptoms in HS is recommended.

As a cross-sectional study, we cannot conclude causality. Patients were recruited from a single center, introducing possible selection bias. Associations between depression and arthralgia could not be assessed in regression due to perfect correlation.

We highlight the importance of managing depression in HS patients to lessen its potential effects on pain processing and worsened MSK symptoms. Larger cohort studies exploring the impacts of sex and depression on MSK symptoms are recommended.

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