Descriptive Epidemiology of Hidradenitis Suppurativa in Greece: A Study of 152 Cases

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Keywords

Hidradenitis suppurativa · Epidemiology · Greece · Hurley stage · Smoking · Family history

Abstract

Background/Objective: Hidradenitis suppurativa (HS) is a chronic, inflammatory skin disease that remarkably affects the patients' quality of life. A prospective study of 152 HS patients was conducted in order to depict the clinico-epidemiological characteristics of HS patients in Greece. **Materials and Methods:** From February 2015 to August 2016, 152 patients attended the Hidradenitis Suppurativa Outpatient Clinic of our department. The most important clinico-epidemiological data of the patients were registered. Descriptive statistics and an ordered logistic regression analysis were performed. **Results:** Of the 152 patients, 60.5% were females. Their median age was 37 years. A total of 26.3% of the patients suffered from Hurley stage I, 44.7% from Hurley stage II, and 29.0% from Hurley stage III. The median duration of disease was 9 years. The most common site of involvement was the groins. The mean Dermatology Life Quality Index (DLQI) was higher for Hurley stage III. In multivariable analysis, only the body mass index was found to independently predict the disease severity. **Conclusion:** Among the factors

examined, the body mass index appears to independently predict the disease severity. Quality of life evaluation revealed a stronger impact compared to the international experience. To our knowledge, this is the first descriptive epidemiological study among HS patients in Greece.

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Introduction

Hidradenitis suppurativa (HS) is a chronic, recurrent inflammatory skin disease that affects apocrine gland-bearing sites, such as the axillae, as well as the inguinal and perianal areas [1]. HS is characterized by inflammation of the hair follicles, most often manifested by painful nodules or boils that progress to abscesses, sinus tract formation, and scarring [2, 3]. Smoking, obesity, and family history are considered to be important risk factors. Severity is typically assessed by Hurley staging, with Hurley stage I representing mild disease, stage II moderate disease, and stage III severe HS [4–6]. HS has been described in association with several other inflammatory conditions, such as inflammatory bowel diseases, spondyloarthropathies, epithelial cancers, such as squamous cell carcinoma, and pyoderma gangrenosum [7–9]. Other re-

ported associations, including anemia and amyloidosis, better qualify as complications rather than as comorbid disorders [10, 11].

The quality of life of HS patients has been found to be severely impaired, with a stronger impact than in other debilitating skin diseases, such as psoriasis and urticaria [12, 13]. The condition is often accompanied by embarrassment, low self-esteem, social stigma, and influence on interpersonal relationships because of the pain, the malodorous discharge, and the cloth staining [14, 15].

We conducted a prospective clinico-epidemiological study among patients visiting the Hidradenitis Suppurativa Outpatient Clinic of our department. The aim of our study was to depict the clinico-epidemiological characteristics of HS patients in Greece and to assess the impact of the disease on patients' quality of life.

Materials and Methods

From February 2015 to August 2016, 152 patients attended the Hidradenitis Suppurativa Outpatient Clinic of the 2nd Department of Dermatology and Venereology at the “Attikon” General University Hospital, Athens, Greece. The diagnosis of HS was made on clinical grounds, based on the diagnostic criteria described in the European guidelines [16]. In all patients, clinical and epidemiological data were recorded, including age, gender, body mass index (BMI), smoking status, family history, Hurley stage, and duration of disease. The quality of life of the patients was assessed during the first visit at the clinic, using a validated version of the Dermatology Life Quality Index (DLQI), translated into Greek.

All patients have given their informed consent, and the study protocol has been approved by the Ethics Committee of our hospital.

Statistical Analysis

Descriptive statistics are presented as means ± standard deviations (SD), medians and ranges, or percentages when appropriate. To compare the quality of life (as assessed with DLQI) among the 3 patient groups with a different disease severity (Hurley stage), we used the nonparametric Kruskal-Wallis (equality-of-populations) rank test. Then, in order to gain an insight into the variables that are associated with an individual's likelihood of being classified into a higher Hurley stage of disease, ordered logistic regression analysis was performed. Covariates included in the univariable and the multivariable models were either binomial (family history, smoking status, and gender) or continuous variables (age, BMI, number of cigarettes smoked per day, age at disease onset, and duration of disease). In univariable analyses, a criterion of *p* ≤ 0.10 was used to identify candidate predictors. After that, we fitted a multivariable model and used the backwards selection procedure to eliminate those variables not significant in the multivariable framework. We used a criterion of *p* ≥ 0.05 for determining which variables to eliminate. The proportional odds ratios (OR) derived from the ordered logistic regression models refer to the odds of being in a higher, rather than lower, Hurley stage of HS, with Hurley stage III as the highest category of severity, and are shown with

Table 1. Characteristics of the study population (n = 152)

Age, years	37.4±13.5; 37 (13–96)
Age at disease onset, years	26.7±12.7; 24 (5–81)
Disease duration, years	10.6±8.7; 9 (1–48)
Male gender, %	60 (39.5)
Family history, %	49 (32.2)
BMI	30.4±6.7; 30.4 (18.4–54.9)
Active smoker, %	110 (72.4)
Quality of life, DLQI score	11.9±7.7; 11 (1–30)
Hurley stage of HS	
Hurley stage I	40 (26.3)
Hurley stage II	68 (44.7)
Hurley stage III	44 (29.0)
Localization of disease	
Groin	94 (61.8)
Axillae	84 (55.3)
Buttock	30 (19.7)
Breast	25 (16.4)
Abdominal	22 (14.5)
Pilonidal sinus	43 (28.3)
Other	24 (15.8)

Values are mean ± SD with median (range) or *n* (%).

their 95% confidence intervals (CI) and the respective *p* values. For hypothesis testing, a probability level of <0.05 was considered as statistically significant. All statistical tests are two-sided. Stata software was used for all statistical analyses (Stata Corp., College Station, TX, USA).

Results

Gender and Age

This cross-sectional study included 152 consecutive patients with HS. Of these, 60 were males (39.5%) and 92 females (60.5%). Their age ranged from 13 to 96 years (median, 37).

Hurley Stage, Localization, and Disease Duration

At the time of diagnosis, 40 patients (26.3%) were classified as Hurley stage I, while 68 (44.7%) as Hurley stage II, and 44 (29.0%) as Hurley stage III. The duration of disease ranged from 1 to 48 years (median, 9). As far as the localization is concerned, groins were involved in 94 patients (61.8%), axillae in 84 (55.3%), buttocks in 30 (19.7%), breasts in 25 (16.4%), and abdominal fold in 22 patients (14.5%). Forty-three patients suffered from or had a history of pilonidal sinus (28.3%).

Table 2. Ordered logistic regression analysis using Hurley stage as the outcome variable

Covariates	Univariable analysis			Multivariable analysis		
	OR ³	95% CI	<i>p</i> value	OR ³	95% CI	<i>p</i> value
Age ¹	1.01	0.99–1.03	0.39	–	–	–
Gender	0.90	0.49–1.64	0.72	–	–	–
Family history	0.61	0.32–1.17	0.14	–	–	–
BMI ²	1.08	1.03–1.13	0.002	1.08	1.03–1.13	0.002
Smoking status	1.10	0.57–2.10	0.78	–	–	–
Cigarettes smoked per day ²	1.00	0.98–1.03	0.77	–	–	–
Age at disease onset ¹	0.99	0.97–1.01	0.39	–	–	–
Disease duration ¹	1.04	1.01–1.08	0.025	–	–	–

OR, odds ratio; CI, confidence interval.

¹ Per 1-year increase. ² Per 1-unit increase. ³ The proportional ORs refer to the odds of being in a higher, rather than lower, Hurley stage of HS, with Hurley stage III as the highest category of disease severity.

Family History

Of the 152 patients, 49 patients had a positive family history of HS (32.2%) and 103 patients had a negative family history (67.8%). Of the 49 patients with a positive family history, 37 (75.5%) had 1, 8 (16.3%) had 2, and 4 (8.2%) had 3 family members affected.

Smoking Status

Regarding the smoking status, 110 patients were active smokers (72.4%), 31 were nonsmokers (20.4%), and 11 were ex-smokers (7.2%).

Body Mass Index

Three patients had a BMI <20 (underweight); 35 patients had a BMI ≥20–<25 (normal weight); 35 patients ≥25–<30 (overweight); 44 patients ≥30–<35 (moderately obese); 22 patients ≥35–<40 (severely obese); and 13 patients ≥40 (very severely obese). The mean BMI was 30.4 (SD 6.7), and the median value was 30.4 (range, 18.4–54.9).

Occupation

Thirteen patients (8.5%) were employed in the public sector, 29 (19.0%) were freelancers, 55 (36.2%) were employed in the private sector, 15 (9.9%) were housewives, 16 (10.6%) were students, 5 (3.3%) were pupils, 4 (2.6%) were retired, and 15 (9.9%) were unemployed.

Dermatology Life Quality Index

Quality of life was evaluated in all patients using DLQI. The mean DLQI score was 11.9 ± 7.7 and the median 11

(1–30). Among our patients, the DLQI score was 0–1 (no effect on quality of life) in 8 patients (5.3%), 2–5 (small effect on quality of life) in 35 patients (23.0%), 6–10 (moderate effect on quality of life) in 30 patients (19.7%), 11–20 (very large effect on quality of life) in 53 patients (34.9%), and 21–30 (extremely large effect on quality of life) in 26 patients (17.1%). Descriptive characteristics of the study population are summarized in Table 1.

Evaluation of the Association between Hurley Stage of Disease and Quality of Life

Quality of life, as assessed with DLQI, was significantly different among patients in different Hurley stage groups ($p = 0.024$). The mean DLQI (± SD) and the median DLQI (range) for Hurley stage I were: 10.7 (±7.5) and 11 (1–21), respectively; for Hurley stage II: 10.0 (±6.5) and 10 (1–27), respectively; and for Hurley stage III: 16.8 (±8.3) and 16 (4–30), respectively. Apparently, the quality of life in patients classified as Hurley stage III was most significantly impaired (i.e., they demonstrated higher DLQI scores; $p = 0.024$).

Variables Predicting an Individual's Likelihood of Being Classified into a Higher Hurley Stage of Disease

We performed an ordered logistic regression analysis using the Hurley stage as outcome variable. In the univariable analyses, the BMI ($p = 0.002$) and disease duration ($p = 0.025$) were found to predict a higher Hurley stage of disease. However, in multivariable analysis, only the BMI ($p = 0.002$) was found to independently predict the disease severity (Table 2).

Discussion

According to our results, HS was more prevalent among females (60.5%). The median age of our patients was 37 years, ranging between 13 and 96 years. Almost 45% of our patients suffered from Hurley stage II disease. The inguinal region (61.8%) was the most common site of involvement, followed by the axillary region (55.3%) and the buttocks (19.7%). The duration of the disease ranged from 1–48 years, with a median duration of 9 years. The vast majority (72.4%) of our patients were active smokers, and 7.2% were ex-smokers. Seventy-five percent of our patients were either overweight or obese. Among these patients, the majority were moderately obese (28.9%). Almost 1 out of 3 patients had a family history of HS. In most of our patients, the disease was found to have a very large (34.9%) or an extremely large (17.1%) effect on quality of life. Higher DLQI scores were associated with a higher Hurley stage disease. Among the variables tested, only the BMI was found to independently predict the disease severity. We had suggestive evidence that also disease duration predicts disease severity (the longer the duration, the higher the disease severity). However, the rather limited sample size (i.e., low statistical power) may have not allowed this variable to enter the multivariable model.

Several studies have attempted to assess the frequency of HS. European studies estimated the prevalence of HS to be 1% in the general population [17, 18] and 4% in young adult women [19]. In contrast, American surveys reported a prevalence between 0.05 and 0.20% [20, 21]. A low socio-cultural level among HS patients is frequently found [22]. According to the international experience, female sex appears to be affected more frequently, with the reported female to male ratio ranging from 3:1 to 4:1 [23, 24]. Women are more often affected in axillary, submammary, and inguinal regions, while perianal, perineal, and gluteal involvement is more common among men [25–27]. Pilonidal sinus is frequently associated with HS, in about 30% of the patients [7].

Smoking and obesity are well known risk factors for HS [16]. The percentage of active or ex-smokers among HS patients ranges between 70 and 88.9% in different studies [25, 28]. Furthermore, the percentage of overweight patients is reported to be over 50% [26, 29]. There is also a positive correlation between the level of BMI and the severity of the disease, as well as a strong connection between BMI and insulin resistance [25, 30].

The role of genetic predisposition in HS has not been clarified yet. In a study by von der Werth and Williams

[25], about 40% of HS patients report to have other family members also affected. In some families, an autosomal dominant mode of inheritance was suggested [31]. Patients with familial HS often show an early onset and a more severe disease course [32, 33].

Several studies have confirmed an impaired quality of life among HS patients [34, 35]. A Canadian study performed among 55 HS patients, revealed a mean DLQI score of 10 ± 8.8 , indicating a moderate effect on patients' lives. The severity of disease, as measured by Hurley staging, the number of lesions, and patient-reported quality of life were significantly correlated with the DLQI score [34, 36].

Onderdijk et al. [15] showed that patients with more severe disease, as assessed by Hurley stage or number of flares during the last month, had markedly higher DLQI scores. A recent Greek study revealed a mean DLQI score of 11.43 ± 6.61 among HS patients. Anxiety, depression, loneliness, and social isolation scores were statistically significantly higher ($p < 0.001$) among HS patients compared to healthy controls [37].

To our knowledge, this is the first descriptive epidemiological study among HS patients in Greece. Our results were in accordance with the published international experience. Among factors examined, only the BMI appears to independently predict the disease severity. Quality of life assessment among our patients revealed a stronger impact compared to the previous experience. There is an increasing number of HS patients seeking detailed and in-depth medical assistance in Greece. There is certainly a lot of work to be done, in the direction of a high-level multidisciplinary approach that those patients deserve.

Statement of Ethics

All patients have given their informed consent and the study protocol has been approved by the Ethics Committee of our hospital.

Disclosure Statement

The authors do not have any conflicts of interest concerning this study.

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