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The Frequency of Comorbidities and Their Effects on Disease Severity in Hidradenitis Suppurativa

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ABSTRACT

Background: Hidradenitis suppurativa (HS) is a chronic, inflammatory disease of the apocrine glands which may progress with remissions and attacks. Clinically lesions are frequently located in the axillary, perianal, and inguinal regions which may present with painful nodules, abscesses, sinuses, or scars. Metabolic syndrome, cardiovascular diseases, rheumatological diseases can be associated with HS and may cause impaired life quality and mortality risk. In this study, we aimed to determine the demographic data and accompanying comorbidities of patients diagnosed with HS, as well as to investigate whether is there any effect of comorbidities on disease severity.

Materials and Methods: Clinical findings of 120 patients, who were diagnosed as HS in our clinic or consulted to our clinic between 2017 and 2020 were evaluated retrospectively. Demographic and clinical data of the patients including age, gender, Hurley stage at presentation, smoking status, and comorbidities of the patients were obtained from medical records. The statistical analysis was performed with the Statistical Package for the Social Sciences 21.

Results: According to our study results, 49 (40.8%) patients were women and 71 (59.2%) were men. The average age of the patients was 35.23 ± 10.25 (17-59), the average age of our female patients was in female patients was 32.5 ± 9.47 , and the average age of our male patients was 37.1 ± 10.4 . The mean age of disease onset was 25.44 ± 9.03 (10-52). Thirteen patients were in Hurley stage 1, 80 patients were in Hurley 2 and 27 patients were in Hurley 3. Ninety-eight patients (81.7%) had a smoking history. Of 121 patients, 59 (49.2%) of our patients had comorbidity. Metabolic syndrome was the most common comorbid disease. The presence of comorbidity only makes a significant difference in terms of being in the first stage of the disease.

Conclusion: HS may be associated with various comorbidities, especially metabolic syndrome. Although we found no significant difference between having a comorbidity and disease stage systemic evaluation of the patients may be useful both in the early diagnosis and treatment of comorbidities and increasing the life quality of these patients.

Keywords: Apocrine glands, Dermatology, Inflammation, Hidradenitis suppurativa, Comorbidities, Metabolic syndrome

Introduction

Hidradenitis suppurativa (HS) is a chronic auto-inflammatory disease with exacerbation episodes observed in areas of skin rich in apocrine glands. The disease is characterized by painful nodules, abscesses, and scars [1]. It is more common in the postpubertal period and women are more affected than men. Its prevalence is between

0.05% and 4% [2,3]. Its etiology is not clear but it is considered a component of the follicular occlusion triad which is thought to begin with hair follicle hyperkeratinization and follicle occlusion [4,5]. Studies have shown that the incidence is higher in smokers [6]. It has been stated that cigarette content, especially nicotine, can increase follicle occlusion, inflammatory cell chemotaxis, and



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tumor necrosis factor- α release, which play a role in pathogenesis [4,5]. The diagnosis of the disease is made by clinical symptoms and signs. The typical appearance of the lesions, their distribution, and their progressive and chronic features with recurrences are important in diagnosis [7]. Histopathological evaluation can be used in cases where the differential diagnosis cannot be made [8]. Hurley staging is used in the severity evaluation of HS [9]. Physical and psychosocial problems are also commonly seen in patients with HS, and the disease may be accompanied by metabolic syndrome, cardiovascular diseases, psychiatric diseases, dermatological diseases, and other inflammatory diseases [10].

Materials and Methods

In this retrospective study, 120 patients who applied to Istanbul University Cerrahpasa-Cerrahpasa Faculty Medicine Dermatology and Venereal Diseases Department between January 2017 and August 2020 and were diagnosed with HS were evaluated. We conducted our research according to the World Medical Association Declaration of Helsinki and obtained the approval of the Istanbul University Cerrahpasa-Cerrahpasa Faculty Medicine Local Ethics Committee (ethical approval: 17.12.2020/164438). The age, gender, Hurley stage at presentation, smoking status, and comorbidities of the patients were retrospectively reviewed and noted.

Statistical Analysis

Statistical analysis was performed using Statistical Package for the Social Sciences version 21. Descriptive analyzes mean and standard deviation, median, 25-75 by data type. It is given as quartiles and percentages. The distribution of continuous data was evaluated with the Shapiro-Wilk and Kolmogorov-Smirnov test. Comparisons between groups were made with Fisher's Exact test (Fisher's exact test) when the chi-square test and chi-square test conditions were not met in categorical variables. The Kruskal-Wallis test was used for multiple comparison procedures for continuous data that did not meet the normality conditions. A p value below 0.05 was considered significant.

Results

According to our study results, 49 (40.8%) of our patients were women and 71 (59.2%) were men. The mean age of the patients was 35.23 ± 10.25 (minimum-maximum: 17-59), 32.5 ± 9.47 (minimum-maximum: 17-58) in females, and 37.1 ± 10.4 (minimum-maximum: 18-59) in males. The mean age at disease onset age was 25.44 ± 9.03 (19-30.75). The median age distribution according to the stage of the patients is given in Table 1. No significant correlation was found between the age of onset and the Hurley stage ($p=0.136$). According to the Hurley classification, 13 patients were in stage 1 (10.8%), 80 were in stage 2 (66.6%), and 27 were in stage 3 (22.5%)

(Table 2). Ninety-eight (81.7%) patients had a smoking history, but no significant relationship was found between smoking and disease stage (Fisher's Exact test, $p=0.441$) (Table 3). Among the smokers, 9 (9.2%) were in stage 1, 66 (67.3%) were in stage 2 and 23 (23.5%) were in stage 3, and among the non-smokers, 4 (18.2%) patients were in stage 1, 14 (63.6%) patients were in stage 2 and 4 (18.2%) patients were in stage 3. While 59 (49.2%) of our patients had comorbidity, 61 (50.8%) had no accompanying disease. The distribution of comorbidities is shown in Table 4. In 3.4% ($n=2$) of the patients with comorbidity, the disease is in the first stage, and in 18% ($n=11$) of the patients without comorbidity, the disease is in the first stage. The presence of comorbidity makes a significant difference in terms of being in the first stage of the disease (Pearson's chi-square test, $p=0.03$). There was no difference in the presence of comorbidity in patients in stages 2 and 3 (Table 5).

Discussion

Although the prevalence of HS is not fully known, it is estimated that it occurs in approximately one in 300 adults. The usual onset is in the second or third decade of life and rarely occurs before puberty and after the age of 40 [11]. In our study, HS was more common in young adults. It was reported that women are more likely to develop HS than men in United States-based studies [12].

Table 1. Demographic characteristics of the patients

Clinical findings of the patients			
Characteristics	Female	Male	Total
Mean age	32.51 ± 9.47	37.11 ± 10.41	35.23 ± 10.25
Disease onset	23.53 ± 7.98	26.76 ± 9.52	25.44 ± 9.03
Smoking	37	61	98
Metabolic syndrome	14	18	32
Rheumatologic diseases	2	1	3
Psychiatric disorder	4	2	6
Coronary artery disease	2	4	6
Dermatologic diseases	4	2	6
Inflammatory bowel disease	1	1	2
Respiratory tract disease	2	2	4

Table 2. The median age distribution according to the stage of the patients

Hurley	Median (IQR)
Stage 1 (13 patients)	20 (15.5-24.5)
Stage 2 (80 patients)	25 (19.25-30)
Stage 3 (27 patients)	24 (18-35)
IQR: Interquartile range	

Table 3. Correlation between smoking and disease severity

			Stage 1	Stage 2	Stage 3	Total
Smoking	No smoking	No	4	14	4	22
		% within smoking	18.2%	63.6%	18.2%	100.0%
	Smoking	No	9	66	23	98
		% within smoking	9.2%	67.3%	23.5%	100.0%
Total		No	13	80	27	120
% within smoking		10.8%	66.7%	22.5%	100.0%	

Fisher's Exact test p=0.441

Table 4. Distribution of comorbidities

Comorbidity		Frequency	Percent
No comorbidity	Stage 1	11	18.0
	Stage 2	36	59.0
	Stage 3	14	23.0
	Total	61	100.0
Metabolic syndrome	Stage 2	25	78.1
	Stage 3	7	21.9
	Total	32	100.0
Rheumatologic disorder	Stage 1	1	33.3
	Stage 2	2	66.7
	Total	3	100.0
Psychiatric disorder	Stage 2	4	66.7
	Stage 3	2	33.3
	Total	6	100.0
Coronary artery disease	Stage 2	6	100.0
Dermatologic diseases	Stage 2	5	83.3
	Stage 3	1	16.7
	Total	6	100.0
Inflammatory bowel disease	Stage 2	1	50.0
	Stage 3	1	50.0
	Total	2	100.0
Respiratory tract disorder	Stage 1	1	25.0
	Stage 2	1	25.0
	Stage 3	2	50.0
	Total	4	100.0

In another study which was conducted in Korea HS was found more be more frequent in men [13]. In two studies published in Turkey, HS was reported to be more common in men [14,15]. In our study, male patients were also in the majority. Gender differences in HS in studies conducted in Europe and Asia may be related to hormonal factors, smoking habits, genetic background, geographical and ethnic differences [16].

Mechanical stresses on the skin, obesity, genetic susceptibility, smoking, diet, and hormonal factors are cited as factors that may be associated with the development or exacerbation of

Table 5. Distribuion of comorbidities according to stage

	Frequency	Percent	Valid percent
No	61	50.8	50.8
Metabolic syndrome	32	26.7	26.7
Rheumatologic diseases	3	2.5	2.5
Psychiatric disorder	6	5.0	5.0
Coronary artery disease	6	5.0	5.0
Dermatologic diseases	6	5.0	5.0
Inflammatory bowel disease	2	1.7	1.7
Respiratory tract disease	4	3.3	3.3
Total	120	100.0	100.0

HS [17]. There is a strong relationship between smoking and HS [18]. The nicotine released with sweat is thought to induce epithelial hyperplasia in surrounding cells, causing occlusion and hyperkeratosis in the follicle [19]. In a French case-control study of 302 clinically assessed patients with HS and 906 controls, 76% of the patients with HS versus 25% of the controls were current smokers [20]. In another study which was conducted by Kromann et al. [21], tobacco smoking was reported in 92.2% of the patients with HS. In our study, 81.7% of our patients were smoking. Our study results support the high smoking rate in patients with HS. In the Scandinavian study, disease severity was found to be higher in smoking patients [22]. Another study reported that smoking was correlated with disease severity [18]. However, there are also studies reporting that there is no relationship between smoking and disease severity [23]. In our study, the majority of our patients also had smoked, but no significant relationship was found between smoking and disease stage. The results of studies investigating the relationship between smoking and disease severity in HS are contradictory.

In recent years the comorbid diseases accompanying HS have been investigated in several studies. Both inflammatory disorders and autoimmune disorders may be associated with HS. Metabolic syndrome and cardiac diseases were reported as the most common comorbidities in patients with HS [24]. In our study 32 (26.7%) patients had accompanying comorbidity and half of the patients

who have an accompanying disease had metabolic syndrome. Egeberg et al. [25] reported that Crohn's disease and ulcerative colitis may be associated with HS. There are some studies about the relationship between rheumatological diseases, especially axial spondyloarthritis, and HS [26,27]. HS can also cause serious psychosocial problems due to its clinical findings [28]. Therefore, patients with HS should be evaluated and supported in terms of quality of life and psychiatry. In our study, 10% of the comorbidities were psychiatric disorders.

There are few studies in the literature regarding the effect of comorbidities on disease severity in patients with HS [29,30]. In a recent study published by Liakou et al. [29], thyroid disease and active smoking were found to be associated with more severe HS. Özkur et al. [15] also reported that presence of comorbidity and having a delayed diagnosis were associated with disease severity. In our study, we found no significant correlation between disease severity and having comorbidity.

Study Limitation

The main limitation of our study is being a retrospective study that was conducted from a single center with a limited patient number.

Conclusion

In conclusion, HS may be associated with various comorbidities, especially metabolic syndrome. Although we found no significant difference between comorbidities and HS severity, the most common disorders should be questioned and consulted with appropriate clinics. Further investigation of HS disease in larger prospective studies is needed to clarify its clinical-epidemiological characteristics and to better understand its etiology and management.

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Ethics

Ethics Committee Approval: We conducted our research according to the World Medical Association Declaration of Helsinki and obtained the approval of the Istanbul University Cerrahpasa-Cerrahpasa Faculty Medicine Local Ethics Committee (ethical approval: 17.12.2020/164438).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: T.K.U., E.C.Ö., Concept: T.K.U., Ö.A., B.E., Design: T.K.U., Ö.A., B.E., Data Collection or Processing: E.C.Ö., Ö.A., Analysis or Interpretation: T.K.U., E.C.Ö., Ö.A., B.E., Literature Search: T.K.U., E.C.Ö., Writing: T.K.U., E.C.Ö.

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