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Retrospective Evaluation of Patients Diagnosed with Hidradenitis Suppurativa According to Hurley Stages

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ABSTRACT

Background: Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease with a prevalence ranging from less than 1% to 4% in the population. The disease affects the apocrine glands and is poorly understood. HS lesions are typically found in intertriginous areas. Genetic and environmental factors, such as high body mass index (BMI) and smoking, are believed to contribute to lesion development. The lesions are classified into three Hurley stages, and treatment varies according to the stage of the disease.

Materials and Methods: This study aimed to evaluate the factors that contribute to the development of HS and the treatments administered based on the Hurley stages. The purpose was to assess the factors associated with an increased risk of HS and examine the treatment approaches specific to each Hurley stage. Between the years 2018 and 2022, a retrospective evaluation was conducted on a total of 31 patients who were followed in our HS outpatient clinic at the Department of Dermatology and Venereology, Istanbul University-Cerrahpasa, Cerrahpasa Faculty of Medicine. The evaluation focused on gender distribution, smoking rates, BMI, and the treatments received, categorized according to the Hurley stages.

Results: When we retrospectively examined the data of 31 patients, 21 were male, and 10 were female. The mean age of male patients was 36, while the mean age of female patients was 30.9. Among the patients, 19% were classified as Hurley stage 1, 29% as Hurley stage 2, and 51% as Hurley stage 3. The smoking rates were 50% in Hurley stage 1, 55% in Hurley stage 2, and 62% in Hurley stage 3. When comparing BMI, the mean BMI was 26.16 kg/m^2 in Hurley stage 1, 27.66 kg/m^2 in Hurley stage 2, and 31.25 kg/m^2 in Hurley stage 3. In terms of treatment, 66% of Hurley stage 1 patients received systemic antibiotic treatment, while all patients in Hurley stage 2 and 3 received systemic antibiotic therapy. None of the Hurley stage 1 patients used adalimumab, while the rate of adalimumab use was 33% in Hurley stage 2 and 42% in Hurley stage 3.

Conclusion: When examining the patients who presented to our clinic, it was observed that HS disease is more prevalent among men, smokers, and individuals with a higher BMI. However, further studies with larger patient cohorts are still necessary to validate these findings.

Keywords: Hidradenitis suppurativa, Hurley stage, Smoking, Body mass index

Introduction

Hidradenitis suppurativa (HS) is a chronic and recurrent inflammatory skin disease with a prevalence ranging from less than 1% to 4% in the population [1,2]. Numerous studies have reported a higher prevalence of HS in women compared to men [3,4,5]. It is predominantly observed in individuals in their second and third decades of life [3,4,5]. HS affects the apocrine glands, and its etiology is believed to involve follicular occlusion, although it remains poorly understood [6]. The disease commonly manifests in intertriginous areas such as the axilla, inguinal, inframammary, perianal, and perineal regions, and less frequently in the scrotum, vulva, pubic area, and abdomen [7]. Lesions associated with HS may

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cause pain, discharge, and malodor, which can have significant psychosocial impacts on patients [8]. Typical HS lesions include nodules, abscesses, fistulas, skin tunnels, comedones, and scars [8,9]. HS lesions are classified into three Hurley stages [10,11]. Hurley stage 1 is characterized by the development of abscesses without scar or tunnel formation, while Hurley stage 2 involves abscesses frequently accompanied by tunnels and scars. Hurley stage 3 is characterized by diffuse involvement [10,11]. Genetic factors, as well as physical factors such as friction and pressure, are believed to contribute to lesion development [12,13,14,15]. Research has shown that HS is more prevalent in individuals with a high body mass index (BMI) and in smokers [16,17]. The management and treatment of HS patients vary according to the Hurley stage.

Materials and Methods

This retrospective study included patients who were diagnosed with HS and presented to the HS follow-up Clinic at the Department of Dermatology and Venereology, Istanbul University-Cerrahpasa, Cerrahpasa Faculty of Medicine between January 1, 2018, and June 15, 2022.

Statistical Analysis

The registered data of the patients in the HS clinic were retrospectively analyzed. Patient characteristics such as age, gender, Hurley stages, smoking status corresponding to these stages, treatments received, and BMI were assessed retrospectively.

The approval of Istanbul Univeristy-Cerrahpasa, Cerrahpasa Faculty of Medicine Ethics Committee was taken before initiating the study (number: E-83045809-604.01.01-649573, date: 21.03.2023).

Results

In this study, 31 patients diagnosed with HS whose data were accessible followed at HS clinic between 2018 and 2022 were included. Of the total 31 patients included in the study, 21 were male (67.74%) and 10 were female (32.25%). The mean age of male patients included in the study was 36, while the mean age of female patients was 30.9. At the time of diagnosis, 19.35% of all patients included in the study were Hurley stage 1, 29.03% were Hurley stage 2, and 51.61% were Hurley stage 3. The patients we followed in our HS outpatient clinic were predominantly hurley stage 3. Of the Hurley stage 1 patients, 50% had a history of smoking, while 55.55% of Hurley stage 2 patients and 62.5% of Hurley stage 3 patients had a smoking history. The mean BMI was 26.16 kg/m^2 for Hurley stage 1 patients, 27.66 kg/m^2 for Hurley stage 2 patients, and 31.25 kg/m^2 for hurley stage 3 patients. The smoking rates and BMI of the patients included in the study according to hurley stages are shown in Table 1. While 66% of Hurley stage 1 patients had a history of using systemic antibiotics, all Hurley stage 2 and 3 patients had a history of systemic antibiotic use. None of the Hurley stage 1 patients had a history of using adalimumab, whereas the rate of adalimumab use was 33.33% in Hurley stage 2 and 43.75% in Hurley stage 3. The treatments received by the patients are shown in Table 2.

Discussion

According to research and studies, factors contributing to the pathogenesis of HS and the reasons for its increased incidence have been identified. A study conducted in the United Kingdom, which included undiagnosed patients, reported an incidence rate of 0.77 [18]. Studies conducted in North America and Europe have shown that HS is more common in women [19,20,21]. In a study conducted in France, it was found that the incidence of HS disease in women was approximately 3.6 times higher than in men [22]. However, in our clinic, we observed a higher incidence in men than in women among the patients who sought medical care. Similarly, another study conducted in Korea found a higher incidence rate of HS in men [23]. The difference in HS incidence rates between genders among European and Asian countries is associated with smoking habits [24]. In our study, the number of male smokers was higher than that of female smokers (55.5% male, 44.5% female).

Studies have observed a positive correlation between smoking and the development of HS. Patients with HS were found to smoke or have a smoking history at the time of diagnosis [25]. A retrospective study conducted in the United States found a higher incidence rate of HS in smokers compared to non-smokers [26]. Nicotine and other tobacco components have been identified as potential contributing factors to follicular occlusion, neutrophil chemotaxis, TNF-alpha production by keratinocytes, and stimulatory effects on Th17 cells [27,28]. In our study, the number of smokers and non-smokers was equal in Hurley stage 1, but the ratio of smokers to non-smokers was higher in Hurley stages 2 and 3. Furthermore, some studies have shown that a smoking history increases disease severity [29,30]. A multicenter study conducted in Turkey and published in 2021 revealed that the incidence rate in men is higher than in women and that it leads to more severe disease in smokers [31]. In

Table 1. Smoking rates and body mass index of the patients

Hurley stage	Smokers	Body mass index
1	50%	26.16 kg/m^2
2	55.55%	27.66 kg/m^2
3	62.5%	31.25 kg/m^2

Table 2. Treatments administered

Hurley stage	Systemic antibiotic	Adalimumab
1	66%	-
2	100%	33.33%
3	100%	43.75%

our study, the highest proportion of heavy smokers was observed in Hurley stage 3, and we observed that smoking increases disease severity.

The relationship between HS and BMI has been investigated in numerous studies. Although the results are conflicting, many studies have found a positive correlation between HS and BMI [32]. Our study also yielded similar results. The average BMI of Hurley stage 1 patients was 26.16 kg/m^2, stage 2 patients had 27.66 kg/m^2, and stage 3 patients had 31.25 kg/m^2. BMI was found to be above the normal range in all stages, and the average BMI increased with higher stages. Our study also supports the positive correlation between HS and BMI. However, it is important to note that both factors are influenced by many other factors, and the causes of HS are still not fully understood.

When the data of the patients followed in our hospital's HS clinic were examined according to Hurley stages and the treatments administered, it was observed that 66% of Hurley stage 1 patients received systemic antibiotic treatment, while all patients in Hurley stages 2 and 3 were treated with systemic antibiotics. In a study of 154 patients who did not respond to oral antibiotic therapy, the efficacy of adalimumab treatment was evaluated. The study included patients with moderate and severe HS. The results showed that patients with high BMI had more severe HS symptoms, and adalimumab treatment resulted in better outcomes for these patients [33].

More studies with larger sample sizes are needed to obtain clearer data on HS.

Study Limitations

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

Conclusion

It is important to conduct a thorough physical examination and gather a detailed medical history when patients with a diagnosis of HS seek care at the outpatient clinic. HS is a disease that has a higher prevalence in individuals who are obese and smoke. Our study yielded similar results, however, further research with a larger sample size is necessary to enhance our understanding of the epidemiological characteristics of patients and to establish appropriate treatment strategies.

Ethics

Ethics Committee Approval: The approval of Istanbul Univeristy-Cerrahpasa, Cerrahpasa Faculty of Medicine Ethics Committee was taken before initiating the study (number: E-83045809-604.01.01-649573, date: 21.03.2023).

Informed Consent: Retrospective study.

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Authorship Contributions

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References

1. Ingram JR. The epidemiology of hidradenitis suppurativa. Br J Dermatol 2020;183:990-998.
2. Prens LM, Bouwman K, Troelstra LD, Prens EP, Alizadeh BZ, Horváth B. New insights in hidradenitis suppurativa from a population-based Dutch cohort: prevalence, smoking behaviour, socioeconomic status and comorbidities. Br J Dermatol 2022;186:814-822.
3. Garg A, Lavian J, Lin G, Strunk A, Alloo A. Incidence of hidradenitis suppurativa in the United States: A sex- and age-adjusted population analysis. J Am Acad Dermatol 2017;77:118-122.
4. Canoui-Poitrine F, Le Thuaut A, Revuz JE, Viallette C, Gabison G, Poli F, Pouget F, Wolkenstein P, Bastuji-Garin S. Identification of three hidradenitis suppurativa phenotypes: latent class analysis of a cross-sectional study. J Invest Dermatol 2013;133:1506-1511.
5. Liy-Wong C, Kim M, Kirkorian AY, Eichenfield LF, Diaz LZ, Horev A, Tollefson M, Oranges T, Philips R, Chiu YE, Ghafari G, Arnold JD, Sprague J, Nguyen H, Wan S, Atenafu EG, Pope E, Hamilton J, Naik HB, Lara-Corrales I. Hidradenitis Suppurativa in the Pediatric Population: An International, Multicenter, Retrospective, Cross-sectional Study of 481 Pediatric Patients. JAMA Dermatol 2021;157:385-391.
6. von Laffert M, Stadie V, Wohlrab J, Marsch WC. Hidradenitis suppurativa/acne inversa: bilocated epithelial hyperplasia with very different sequelae. Br J Dermatol 2011;164:367-371.
7. Slade DE, Powell BW, Mortimer PS. Hidradenitis suppurativa: pathogenesis and management. Br J Plast Surg 2003;56:451-461.
8. Kouris A, Platsidaki E, Christodoulou C, Efstathiou V, Dessinioti C, Tzanetakou V, Korkoliakou P, Zisimou C, Antoniou C, Kontochristopoulos G. Quality of Life and Psychosocial Implications in Patients with Hidradenitis Suppurativa. Dermatology 2016;232:687-691.
9. Poli F, Jemec GB, Revuz J. Clinical presentation. In: Hidradenitis Suppurativa, Jemec GB, Revuz J, Leyden JJ (Eds). Springer; 2006. p. 11.
10. Alikhan A, Sayed C, Alavi A, Alhusayen R, Brassard A, Burkhart C, Crowell K, Eisen DB, Gottlieb AB, Hamzavi I, Hazen PG, Jaleel T, Kimball AB, Kirby J, Lowes MA, Micheletti R, Miller A, Naik HB, Orgill D, Poulin Y. North American clinical management guidelines for hidradenitis suppurativa: A publication from the United States and Canadian Hidradenitis Suppurativa Foundations: Part I: Diagnosis, evaluation, and the use of complementary and procedural management. J Am Acad Dermatol 2019;81:76-90.
11. Roenigk RK, Roenigk HH, Jr. Axillary hyperhidrosis, apocrine bromhidrosis, hidradenitis suppurativa, and familial benign pemphigus: surgical approach. In: Hurley HJ: eds. Dermatologic Surgery: principles and practice. New York: Marcel Dekker; 1989. p.729.
12. van Straalen KR, Prens EP, Willemsen G, Boomsma DI, van der Zee HH. Contribution of Genetics to the Susceptibility to Hidradenitis Suppurativa in a Large, Cross-sectional Dutch Twin Cohort. JAMA Dermatol 2020;156:1359-1362.

13. Kjaersgaard Andersen R, Clemmensen SB, Larsen LA, Hjelmborg JVB, Ødum N, Jemec GBE, Christensen K. Evidence of gene-gene interaction in hidradenitis suppurativa: a nationwide registry study of Danish twins. Br J Dermatol 2022;186:78-85.

14. Nazary M, van der Zee HH, Prens EP, Folkerts G, Boer J. Pathogenesis and pharmacotherapy of Hidradenitis suppurativa. Eur J Pharmacol 2011;672:1-8.

15. Alikhan A, Lynch PJ, Eisen DB. Hidradenitis suppurativa: a comprehensive review. J Am Acad Dermatol 2009;60:539-561.

16. Sartorius K, Emtestam L, Jemec GB, Lapins J. Objective scoring of hidradenitis suppurativa reflecting the role of tobacco smoking and obesity. Br J Dermatol 2009;161:831-839.

17. Bettoli V, Naldi L, Cazzaniga S, Zauli S, Atzori L, Borghi A, Capezzera R, Caproni M, Cardinali C, De Vita V, Donini M, Fabbrocini G, Gimma A, Pasquinucci S, Patrizi A, Pinna AL, Raone B, Ricci M, Virgili A, Balestri R. Overweight, diabetes and disease duration influence clinical severity in hidradenitis suppurativa-acne inversa: evidence from the national Italian registry. Br J Dermatol 2016;174:195-197.

18. Ingram JR, Jenkins-Jones S, Knipe DW, Morgan CLI, Cannings-John R, Piguet V. Population-based Clinical Practice Research Datalink study using algorithm modelling to identify the true burden of hidradenitis suppurativa. Br J Dermatol 2018;178:917-924.

19. Garg A, Lavian J, Lin G, Strunk A, Alloo A. Incidence of hidradenitis suppurativa in the United States: A sex- and age-adjusted population analysis. J Am Acad Dermatol 2017;77:118-122.

20. Canoui-Poitrine F, Le Thuaut A, Revuz JE, Viallette C, Gabison G, Poli F, Pouget F, Wolkenstein P, Bastuji-Garin S. Identification of three hidradenitis suppurativa phenotypes: latent class analysis of a cross-sectional study. J Invest Dermatol 2013;133:1506-1511.

21. Liy-Wong C, Kim M, Kirkorian AY, Eichenfield LF, Diaz LZ, Horev A, Tollefson M, Oranges T, Philips R, Chiu YE, Ghafari G, Arnold JD, Sprague J, Nguyen H, Wan S, Atenafu EG, Pope E, Hamilton J, Naik HB, Lara-Corrales I. Hidradenitis Suppurativa in the Pediatric Population: An International, Multicenter, Retrospective, Cross-sectional Study of 481 Pediatric Patients. JAMA Dermatol 2021;157:385-391.

22. Canoui-Poitrine F, Le Thuaut A, Revuz JE, Viallette C, Gabison G, Poli F, Pouget F, Wolkenstein P, Bastuji-Garin S. Identification of three hidradenitis suppurativa phenotypes: latent class analysis of a cross-sectional study. J Invest Dermatol 2013;133:1506-1511.

23. Lee JH, Kwon HS, Jung HM, Kim GM, Bae JM. Prevalence and comorbidities associated with hidradenitis suppurativa in Korea: a nationwide population-based study. J Eur Acad Dermatol Venereol 2018;32:1784-1790.

24. Happle R. Korean gender differences in hidradenitis suppuratva: nature or nurture? J Eur Acad Dermatol Venereol 2019;33:e256.

25. Revuz JE, Canoui-Poitrine F, Wolkenstein P, Viallette C, Gabison G, Pouget F, Poli F, Faye O, Roujeau JC, Bonnelye G, Grob JJ, Bastuji-Garin S. Prevalence and factors associated with hidradenitis suppurativa: results from two case-control studies. J Am Acad Dermatol 2008;59:596-601.

26. Garg A, Papagermanos V, Midura M, Strunk A. Incidence of hidradenitis suppurativa among tobacco smokers: a population-based retrospective analysis in the U.S.A. Br J Dermatol 2018;178:709-714.

27. van der Zee HH, Laman JD, Boer J, Prens EP. Hidradenitis suppurativa: viewpoint on clinical phenotyping, pathogenesis and novel treatments. Exp Dermatol 2012;21:735-739.

28. Mortaz E, Adcock IM, Ito K, Kraneveld AD, Nijkamp FP, Folkerts G. Cigarette smoke induces CXCL8 production by human neutrophils via activation of TLR9 receptor. Eur Respir J 2010;36:1143-1154.

29. Sartorius K, Emtestam L, Jemec GB, Lapins J. Objective scoring of hidradenitis suppurativa reflecting the role of tobacco smoking and obesity. Br J Dermatol 2009;161:831-839.

30. Vazquez BG, Alikhan A, Weaver AL, Wetter DA, Davis MD. Incidence of hidradenitis suppurativa and associated factors: a population-based study of Olmsted County, Minnesota. J Invest Dermatol 2013;133:97-103.

31. Özkur E, Karadağ AS, Üstüner P, Aksoy B, Eşme P, Çalışkan E, Akoğlu G, Kalkan G, Demirseren DD, Polat M, Ozden MG, Kılınç F, Yalçınkaya İyidal A, Kıvanç Altunay İ, Türkmen M, Uğurer E, Baysak S, Fettahlıoğlu Karaman B, Mammadlı K, Baykal Selçuk L, Türkoğlu Z, Atcı T, Didar Balcı D, Adışen E, Temel B, Aktan Ş, Kaçar N, Gündüz K, Türel Ermertcan A, Özdemir M, Ünal Çakıter A, Çölgeçen E, Uçmak D, Kelekçi H, Ataseven A, Durmaz K, Kaya Özden H, Engin B, Yazıcı S, Alpsoy E. Clinical and demographic features of hidradenitis suppurativa: a multicentre study of 1221 patients with an analysis of risk factors associated with disease severity. Clin Exp Dermatol 2021;46:532-540.

32. van Straalen KR, Vanlaerhoven AMJD, Ardon CB, van der Zee HH. Body mass index at the onset of hidradenitis suppurativa. J Dtsch Dermatol Ges 2021;19:437-439.

33. Kimball AB, Kerdel F, Adams D, Mrowietz U, Gelfand JM, Gniadecki R, Prens EP, Schlessinger J, Zouboulis CC, van der Zee HH, Rosenfeld M, Mulani P, Gu Y, Paulson S, Okun M, Jemec GB. Adalimumab for the treatment of moderate to severe Hidradenitis suppurativa: a parallel randomized trial. Ann Intern Med 2012;157:846-855.