SHORT COMMUNICATION

Retrospective Cohort Study on Asian Patients with Hidradenitis Suppurativa: Factors Associated with the Efficacy of Antibiotic Treatment

Yun Kyung JANG[1#], Sujin MOON[2#], Jung U SHIN[1], Dong Hyun KIM[1] and Hee Jung LEE[1]*
[1]*Department of Dermatology, CHA Bundang Medical Center, CHA University, Seongnam 13496 and* [2]*School of Medicine, CHA University, Seongnam, Korea. *E-mail: derma97@gmail.com*
[#]*These authors contributed equally.*
Accepted Sep 29, 2022; Epub ahead of print Sep 29, 2022
Acta Derm Venereol 2022; 102: adv00797. DOI: 10.2340/actadv.v102.2282

Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease characterized by inflammatory nodules, abscesses, and draining fistulas affecting intertriginous areas (1). There are various treatment guidelines for HS, but it is unclear which type of patients respond well to the treatments. In addition, HS demonstrates racial differences: Asian populations have lower prevalence of HS, less family history of HS, more male individuals, and higher rates of lesion development on the gluteal area than do Western populations (2, 3). The aim of this study was to investigate the clinical characteristics and efficacy of tetracycline and clindamycin monotherapies in Asian patients with HS and to analyse the effects of various factors on the patients' response to first-line antibiotic treatment.

MATERIALS AND METHODS

Patients with HS, treated with systemic antibiotics at CHA Bundang Medical Center, Seongnam, Korea from August 2018 to December 2020 were reviewed retrospectively. Tetracycline, 100 mg/day, was prescribed for patients with Hurley stage 1 and those with Hurley stage 2 (4) with frequent gastrointestinal symptoms ($n=13$) or with side-effects on clindamycin ($n=10$), or having scarring folliculitis phenotype without any active draining fistula lesion ($n=18$). Clindamycin, 600 mg/day, was prescribed for patients with Hurley stages 2 and 3. The treatment response was evaluated using HS Clinical Response (HiSCR) (4) based on medical records and clinical photographs before and after 12 ± 2 weeks. Collected demographics and clinical characteristics of patients were analysed by IBM SPSS Statistics version 26.0 (IBM Co., Armonk, NY, USA). Categorical variables were assessed by Pearson χ^2 test or Fisher's exact test and continuous variables were assessed by Student's *t*-test or Wilcoxon–Mann–Whitney *U* test. The association between treatment response and variables was assessed by logistic regression analysis. $p<0.05$ was considered significant.

RESULTS

A total of 189 patients (115 males, 74 females) were analysed (**Fig. 1**). Of these patients, 49.7% ($n=94$) and 50.3% ($n=95$) were treated with oral tetracycline and clindamycin monotherapies, and 84.0% ($n=79$) and 61.1% ($n=58$) achieved HiSCR, respectively (Table SI).

Patients who did not achieve HiSCR were more likely to have a family history of HS, active smoking history, obesity, diabetes mellitus (DM), a higher number of anatomical regions, higher International HS Severity Score System (IHS4) (5) score, higher Hurley stage, and inflammatory phenotype (Table SII). These factors were also significantly associated with failure to achieve HiSCR in the univariate analysis. In the multivariate analysis, IHS4 score and inflammatory phenotype were still significantly related to HiSCR achievement (Table SIII).

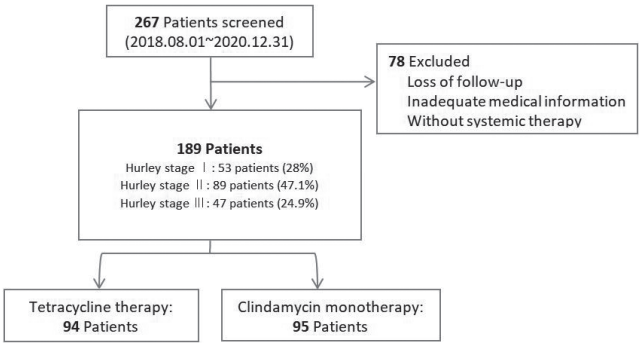

Fig. 1. Study design and patient disposition.

Severe HS group ($n=57$, 30%) based on IHS4 score showed significantly low achievement of HiSCR (13/57, 22.8%) (**Fig. 2**). Obesity, active smoking, and a family history of HS were more prevalent in severe HS group than those with mild to moderate HS (Table SIV). Treatment response was significantly associated with factors such as smoking, number of anatomical regions, number of abscesses, number of draining fistulas, Hurley stage, and clinical lesion types (Table SV). In the univariate and multivariate analysis, active smokers and inflammatory type group had significantly lower treatment responses in the severe HS group (Table SVI).

DISCUSSION

Asian patients with HS significantly achieved HiSCR after 12 weeks of treatment with tetracycline and clindamycin monotherapies. As an alternative to rifampicin–clindamycin combination, clindamycin monotherapy is a useful treatment that could reduce side-effects, such as bacterial resistance, and increase patient compliance (6–8).

Smoking is a known risk factor that doubles the incidence of HS (9). Denny et al. (10) conducted a retrospective cohort study with patients with HS to investigate

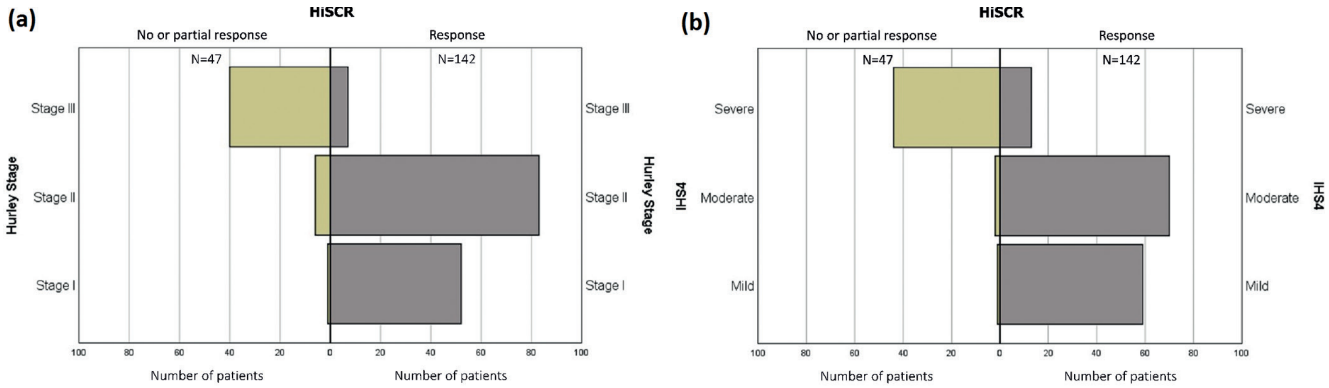

Fig. 2. Pyramid histogram charts of (a) Hurley Stage and (b) International HS Severity Score System (IHS4) by Hidradenitis Suppurativa Clinical Response (HiSCR) HiSCR (>50% response).

the relationship between risk factors and the outcome of first-line treatment, and found a comparable result with our study: non-/former smokers had a better treatment response than active smokers. Our study showed that the severe HS group had a higher proportion of active smokers, and active smoking was significantly associated with a poor treatment response. Therefore, education on smoking cessation is important, especially in patients with severe HS.

Obesity and DM are more prevalent in patients with HS than in those without HS (9). A retrospective study of 36 patients with HS by Iannone et al. (11) stated that high body mass index (BMI) and smoking seemed to be predictive factors for poor treatment response to antibiotics. However, according to the multivariate analysis demonstrated in our study, obesity was not significantly associated with treatment response. In line with previous study (3), wherein the obesity rate (BMI $\geq$30 kg/m^2) of patients with HS was significantly lower in East Asia (15.1%) than in Western countries (37.8%), the number of patients with a BMI of $\geq$30 kg/m^2 in our study was too small to conduct analysis. Therefore, we decided to apply Asia-Pacific classification (12), which is more appropriate for Asian patients, dividing patients into non-obese (BMI <25 kg/m^2) and obese (BMI $\geq$25 kg/m^2) groups. Large-scale studies are required to confirm the effect of body weight on the treatment response of patients with HS.

According to the multivariate analysis, IHS4 score and inflammatory phenotype were significantly associated with HiSCR achievement. IHS4 measures HS severity by assessing inflammatory nodules, abscesses, and draining fistulas (5). Antibiotics are more effective against nodule and abscess than against fistula (11). In our study, IHS4 total score, which reflects the severity of inflammatory lesions, correlated well with patients' response to first-line antibiotic treatment. While HS has many different phenotypic classifications (13, 14), follicular and inflammatory phenotypes were analysed. The inflammatory phenotype mainly includes abscess and fistula, which are highly likely to progress. Therefore, this phenotype can be an independent risk factor for disease progression (13). In our study, all patients at Hurley stage 1 with the follicular phenotype achieved HiSCR, suggesting both severity assessment and classification of clinical phenotype should be considered to predict the treatment response.

Our study thoroughly investigated the relationship between various factors and the treatment response based on HiSCR. Also, our study was conducted on Asian patients, who have different characteristics from those of Western counterparts. However, our study has limitations due to its retrospective nature and small sample size. Also, additional analysis through follow-up is required to investigate rebound after cessation of antibiotics.

In conclusion, applying both classification of clinical phenotype and IHS4 severity scoring system could be useful to physicians in determining treatment regimen, predicting prognosis, and planning treatment escalation. Furthermore, smoking can lead to poor treatment response; hence, patient education on smoking cessation is important.

ACKNOWLEDGEMENTS

Ethical approval was obtained from the ethics committee of CHA Bundang Medical Center (IRB no. 2021-08-050).

The authors have no conflicts of interest to declare.

REFERENCES

1. Saunte DML, Jemec GBE. Hidradenitis suppurativa: advances in diagnosis and treatment. JAMA 2017; 318: 2019–2032.
2. 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.
3. Omine T, Miyagi T, Hayashi K, Yamaguchi S, Takahashi K. Clinical characteristics of hidradenitis suppurativa patients in Okinawa, Japan: differences between East Asia and Western countries. J Dermatol 2020; 47: 855–862.
4. Goldburg SR, Strober BE, Payette MJ. Hidradenitis suppurativa: Epidemiology, clinical presentation, and pathogenesis. J Am Acad Dermatol 2020; 82: 1045–1058.
5. Zouboulis CC, Tzellos T, Kyrgidis A, Jemec GBE, Bechara FG,

Giamarellos-Bourboulis EJ, et al; European Hidradenitis Suppurativa Foundation Investigator Group. Development and validation of the International Hidradenitis Suppurativa Severity Score System (IHS4), a novel dynamic scoring system to assess HS severity. Br J Dermatol 2017; 177: 1401–1409.
6. Caposiena Caro RD, Cannizzaro MV, Botti E, Di Raimondo C, Di Matteo E, Gaziano R, et al. Clindamycin versus clindamycin plus rifampicin in hidradenitis suppurativa treatment: clinical and ultrasound observations. J Am Acad Dermatol 2019; 80: 1314–1321.
7. Rosi E, Pescitelli L, Ricceri F, Di Cesare A, Novelli A, Pimpinelli N, et al. Clindamycin as unique antibiotic choice in hidradenitis suppurativa. Dermatol Ther 2019; 32: e12792.
8. Delaunay J, Villani AP, Guillem P, Tristan A, Boibieux A, Jullien D. Oral ofloxacin and clindamycin as an alternative to the classic rifampicin-clindamycin in hidradenitis suppurativa: retrospective analysis of 65 patients. Br J Dermatol 2018; 178: e15–e16.
9. Garg A, Malviya N, Strunk A, Wright S, Alavi A, Alhusayen R, et al. Comorbidity screening in hidradenitis suppurativa: evidence-based recommendations from the US and Canadian Hidradenitis Suppurativa Foundations. J Am Acad Dermatol 2022; 86: 1092–1101.
10. Denny G, Anadkat MJ. The effect of smoking and age on the response to first-line therapy of hidradenitis suppurativa: an institutional retrospective cohort study. J Am Acad Dermatol 2017; 76: 54–59.
11. Iannone M, Janowska A, Bartolomei G, Puntoni M, Oranges T, Romanelli M, et al. Systemic antibiotics in hidradenitis suppurativa: efficacy and effects of body mass index and smoking pack-year on the response to therapy. Dermatol Ther 2021; 34: e14919.
12. Pan WH, Yeh WT. How to define obesity? Evidence-based multiple action points for public awareness, screening, and treatment: an extension of Asian-Pacific recommendations. Asia Pac J Clin Nutr 2008; 17: 370–374.
13. Martorell A, Jfri A, Koster SBL, Gomez-Palencia P, Solera M, Alfaro-Rubio A, et al. Defining hidradenitis suppurativa phenotypes based on the elementary lesion pattern: results of a prospective study. J Eur Acad Dermatol Venereol 2020; 34: 1309–1318.
14. van der Zee HH, Jemec GB. New insights into the diagnosis of hidradenitis suppurativa: Clinical presentations and phenotypes. J Am Acad Dermatol 2015; 73: S23–S26.