



Original Research

Integrated multidisciplinary approach to hidradenitis suppurativa in clinical practice



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ABSTRACT

Background: The European hidradenitis suppurativa (HS) guidelines recommend a multidisciplinary approach for patients with HS and management of comorbidities.

Objective: We aimed to describe the organization of a multidisciplinary HS program and characterize the patient population.

Methods: We conducted a retrospective study of patients with HS undergoing prospectively defined multidisciplinary work-up including examinations by a dermatologist, plastic surgeon, smoking specialist, and nutritionist in our outpatient unit between October 2015 and January 2017.

Results: The study included 49 patients with a sex ratio of 1:1. A total of 73.4% of patients were smokers, 20.4% were overweight, 48.9% were obese, and 30.6% had symptoms of depression. The mean Sartorius score was 30.4 (± 17.6). The outcome of plastic surgery consultation was as follows: 16 patients had operations, 5 were excluded based on medical history, 9 refused surgery, and 16 remained undecided. The refusal rates for consulting with the smoking cessation and nutrition specialists were 55.8% and 69.5%, respectively. Twelve patients received antibiotics, 9 received biologics, 9 underwent medico-surgical treatment, 9 underwent surgery, and 10 were lost to follow-up. The mean visual analogue scale score for satisfaction was 8.3 (± 1.6 ; $n = 28$).

Conclusion: An integrated multidisciplinary care model for HS is associated with high patient satisfaction. Adherence to the proposed comorbidity management was higher in female patients and related to empathetic interactions with physicians.

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Introduction

Hidradenitis suppurativa (HS) is a chronic, recurrent, inflammatory disease (Zouboulis et al., 2015). Its effect on patient quality of life is among the highest in dermatology (Matusiak et al., 2010). HS interferes with many aspects of everyday life, including work, sexual health, and interpersonal interactions, mainly due to pain, recurrent suppuration, and odor (Alavi et al., 2018; Matusiak et al., 2010). HS occurs more frequently in women, with a sex ratio as high as 3.3:1 (Jemec, 1988). As in other chronic inflammatory diseases, patients with HS frequently have one or more comorbidities.

HS has been associated with smoking, metabolic syndrome, polycystic ovary syndrome, obesity, diabetes, and depression (Crowley et al., 2014; Gold et al., 2014; Miller et al., 2014; Shlyankevich et al., 2014). Per the European guidelines for HS management, clinicians are advised to assess patients for comorbidities and to propose personalized treatment to optimize efficacy and compliance (Zouboulis et al., 2015).

Units of excellence are currently being formed in different countries to provide coordinated care to patients with HS. These units aim to elaborate a personalized plan—based on patients' assessment and comorbidities—to set specific goals, strategies, and responsibilities for action and to ensure their implementation. The beneficial effect of this integrated care model has already been established in psoriasis and atopic dermatitis (LeBovidge et al.,

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2016; Luelmo et al., 2014; Velez et al., 2012). To apply the published European guidelines on HS management, we formed a multidisciplinary team specialized in HS management, coordinated by a dermatologist with a special interest in HS. The team composition is presented in Fig. A.1. All patients were initially assessed by a dermatologist for disease severity, presence of comorbidities, associated diseases, and personal needs.

Next, a personalized treatment plan is constructed, based on the following standardized referral criteria:

1. An assessment by a plastic surgeon is proposed for selected patients with Hurley stage 1 and all patients with Hurley stages 2 and 3. The most commonly proposed surgical approach consists of wide excision of lesions and reconstruction with pedicle flaps when primary closure is impossible. Smoking cessation or significant reduction for at least 1 month before and after surgery is considered mandatory to promote healing. Similarly, significant weight loss in cases of morbid obesity is requested. Partial excision of HS lesions is possible in areas with limited skin involvement.
2. For HS patients who are active smokers, a consultation with a smoking cessation specialist (SCS) is proposed.
3. For overweight patients (body mass index [BMI] ≥ 25 mg/m²), an evaluation of food intake by a dietician is proposed. For obese patients (BMI ≥ 30 mg/m²), a consultation with a physician who specializes in nutrition is proposed. For patients with class 2 obesity (BMI ≥ 35 mg/m²), the nutritionist can discuss a bariatric intervention with a bariatric surgeon.
4. Female patients with clinical signs of hyperandrogenism, hormone serum abnormalities (DHEA, D4 androstenedione, SHBG), and menstrual abnormalities are referred to an endocrinologist; when required, oral contraception with antiandrogenic properties is prescribed. Patients with abnormal levels of fasting blood glucose are referred to the endocrinologist.
5. If inflammatory bowel disease or spondyloarthritis is suspected, patients are referred to a gastroenterologist or rheumatologist, respectively. In these cases, upon consensus among the involved specialists, biologic agents (i.e., tumor necrosis factor- α inhibitors) are the treatment of choice.
6. Patients are assessed to determine if they have a history of anxiety and depression and for ongoing symptoms using the French version of Beck's inventory for depression (Delay et al., 1963). A specialized psychologist can intervene, if necessary.
7. If patients experience chronic pain uncontrolled by step two analgesics, or if neuropathic pain is suspected, patients are referred to a pain management specialist.
8. In cases of newly diagnosed hypertension or dyslipidemia, patients are secondarily referred to their general practitioner for appropriate management.

The dermatologist elaborates the personalized treatment plan with each patient's consent, which is then implemented at our daycare dermatology unit.

To our knowledge, the feasibility of an integrated multidisciplinary approach for HS has not been assessed. The objectives of this work were to describe the organization of an integrated multidisciplinary HS management program and to characterize the HS patient population enrolled. We furthermore sought to determine patient satisfaction and adherence.

Methods

All patients with HS admitted to the outpatient unit between October 2015 and January 2017 were included. We extracted the following prospectively collected data from patients' electronic

medical records: general characteristics (age, sex, medical history), previous HS treatments (surgery, antibiotics, biologics), disease severity scores (Hurley score [Hurley, 1989], modified Sartorius score [MSS; Revuz, 2007]), evaluation of quality of life using the Dermatology Life Quality Index (Finlay and Khan, 1994), and preestablished personalized treatment plan including type of specialist referrals and therapeutic approach proposed. Whenever possible, additional standardized follow-up data were collected by the dermatologist during one of the follow-up visits, including disease severity scores, weight, and tobacco use.

Patient satisfaction with the program was evaluated with a visual analogue scale (VAS; 0–10) and the French version of the validated Princess Margaret Hospital Patient Satisfaction with Doctor Questionnaire (PMH/PSQ-MD) score (0–116; Barlési et al., 2006). The PMH/PSQ-MD score is a 29-item scale evaluating patient–physician interactions in terms of communication, empathy, and time invested. For this subgroup of patients, time to follow-up was defined as the period between the date of the initial evaluation at the outpatient unit and the date of the follow-up visit. Permission to access patient medical records was obtained.

Qualitative variables were presented as absolute number (n) and percentage (%). Quantitative variables were presented as minimum (min), maximum (max), mean, standard deviation (SD), median, and interquartile range (IQR). Statistical analysis was performed only on available data. Continuous data were calculated with the use of mean and SD.

Results

We included 49 patients, 24 (48.9%) of whom were male. Mean (\pm SD) age was 34 years (\pm 11.7 years). The age at onset was 23.2 years (\pm 11.3 years). A total of 11 patients were Hurley stage 1, 29 stage 2, and 9 stage 3. The mean MSS was 30.4 (\pm 17.6; n = 45). The median (IQR) number of areas involved was 3 (2–4). The mean Dermatology Life Quality Index score was 13.4 (\pm 7.6; n = 39), confirming the sizable impact of HS on the quality of life of most patients. Eight patients had previously undergone wide excision and 15 had undergone one or more partial excisions. Nearly one-third of patients (32.5%) had received a mean of 1.2 (\pm 1) previous antibiotic treatments. Patient characteristics are presented in detail in Table A.1.

The study population had a high prevalence of comorbidities, which are summarized in Fig. A.2. There was a high percentage of active (73.4%) and former (8.1%) smokers. A total of 16.3% of patients reported current consumption of cannabis and 8.1% had various co-addictions. Ten patients (20.4%) were overweight and 24 (48.9%) were obese. The mean BMI was 29.7 (\pm 7.2) mg/m². Eight patients (16.3%) had a history of depression and 10 (20.4%) of anxiety. Symptoms of depression, defined by a cutoff value of ≥ 8 in the 13-item Beck's inventory for depression (BID) score, were present in 14 patients (28.5%). Seventeen patients had two comorbidities and 17 had 3 or more, when the following comorbidities were considered: alcohol use, tobacco use, cannabis use, obesity, Crohn's disease, spondyloarthritis, diabetes, dyslipidemia, and polycystic ovary syndrome.

A personalized medical care plan was developed for each of the 49 patients. Twenty-three patients (46.9%) were eligible for a consultation with the nutrition specialist. Sixteen of these patients (69.5%) refused to attend. The seven who attended were given advice on dietary changes and increased exercise (n = 5), attendance of specific programs (n = 1), and referral to bariatric surgery (n = 1). Dietician interventions were proposed to 41 patients and accepted by 30 (73.1%).

Among patients with ongoing symptoms of anxiety and/or depression, the psychologist evaluated seven patients; two refused

the intervention. Fifteen smokers consulted an SCS whereas 19 (52.9%; $n = 34$) refused the intervention. Ten patients were prescribed a nicotine replacement treatment. Three female patients were diagnosed with polycystic ovary syndrome after endocrinology referral. Two patients were referred to the gastroenterologist for clinical suspicion of Crohn's disease, and three were referred to the rheumatologist with a clinical suspicion of spondyloarthropathy ($n = 2$) and pyogenic arthritis/pyoderma gangrenosum/acne/hidradenitis suppurativa syndrome ($n = 1$).

A consultation with a plastic surgeon was proposed to 46 patients and accepted by 42 (91.3%). After this consultation, 16 patients underwent a surgical procedure. Of these patients, 12 had wide surgical excision of HS lesions, followed by immediate reconstruction with pedicle vascular flaps in eight patients. In five patients, surgical excision was ruled out by the plastic surgeon based on medical history: cardiovascular comorbidities ($n = 1$), heavy smoking ($n = 1$), morbid obesity ($n = 1$), severe Crohn's disease ($n = 1$), and widespread disease ($n = 2$). Nine patients refused surgery, and 16 remained undecided.

For 12 patients, an antibiotic regimen alone was prescribed either as monotherapy (doxycycline, ceftriaxone, pristinamycin) or as a combination of antibiotics (rifampicin, clindamycin and metronidazole or rifampicin, moxifloxacin and metronidazole). For 13 patients, a biological agent was prescribed: Infliximab ($n = 11$), anakinra associated with etanercept ($n = 1$), and adalimumab ($n = 1$). Biologics were prescribed either alone ($n = 9$) or in combination with surgery or antibiotics ($n = 4$). Nine patients received combination treatments including at least two of the following: antibiotics, wide excision, partial excision, deroofing with carbon dioxide laser, and biologics. Four patients underwent laser hair removal in affected areas. Ten patients refused any type of medical or surgical treatment and were lost to follow-up. Adherence to the proposed treatment plan was in general higher among female patients.

Follow-up data were obtained for 28 patients (57.1%). For the analysis, these patients were divided into four subgroups according to their treatment plan: Biologics (group A; $n = 9$), antibiotics (group B; $n = 8$), surgical treatment (group C; $n = 4$), and combination therapy (group D; $n = 7$). In the combination therapy subgroup, three patients underwent wide excision of at least one anatomical area and one patient underwent partial excision. The overall mean MSS at baseline was 29.7 (± 17.1). The mean improvement after a mean follow-up of 60.3 weeks (± 31.8 weeks) was -6.3 (± 16.2). Disease severity at baseline was similar in the four subgroups: mean MSS score of 28.7 (± 37) in group A, 27.3 (± 43.9) in group B, 21.2 (± 27.2) in group C, and 32.7 (± 44) in group D. The mean improvement in MSS was higher in surgically treated patients (-12.5 ; ± 6.4) and in the subgroup of patients receiving combination treatment (-15.2 ; ± 11.1).

In this latter group of patients, 10 of 20 active smokers with a mean daily cigarette consumption of 16.2 (± 7.6) attended the smoking cessation program. Six patients ceased smoking. The mean number of cigarettes per day was reduced to 14 (± 9). Smokers in this group had particularly high dependence scores (median Fagerström score [Heatherton et al., 1991] of 5 of 10 [IQR, 2.5–6]) and low motivation scores (median Richmond score [Richmond et al., 1993] of 3 of 10 [IQR, 2–3.5]). Only four patients reduced their BMI between two visits. Ten patients gained weight. The mean BMI stayed relatively stable, 30.1 (± 7.2) before and 30.7 (± 8.8) after the intervention. There was no correlation between smoking cessation and weight gain. The mean VAS for weight loss motivation among patients who remained obese and overweight at follow-up was 7.8 of 10 (± 9).

Among the 28 patients who attended the follow-up visit, satisfaction with the integrated multidisciplinary approach was high. The mean VAS score was 8.3 (± 1.6). The mean satisfaction VAS var-

ied according to treatment plan and was higher among surgically treated patients (mean: 9.3; SD: 0.9) and lower among antibiotic-treated patients (mean: 7.8; SD: 2.2; Fig. A.3). The median PMH/PSQ-MD score was 103.5 (IQR, 96.8–109.5), which indicates a good patient–physician interaction. Female patients were particularly sensible to empathetic interaction and time accorded by the physicians, whereas male patients mostly appreciated the information communicated related to the disease and its management.

Discussion

This study shows that patients with HS have a high number of comorbidities, especially obesity, smoking, anxiety, and depression, which supports an integrated multidisciplinary approach. The multidisciplinary HS care plan proposed was associated with high levels of patient satisfaction. However, adherence to the pre-established personalized medical care plan was relatively low, as evidenced by the relatively high percentage of patients lost to follow-up.

Additionally, the willingness of patients to consult with an SCS and obesity specialist was limited. Female patients demonstrated a higher adherence to the medical care plan. Physicians have a limited ability to alter comorbidities in the short term, as indicated by the high rates of referral refusal and the poor outcomes regarding comorbidity management noted at follow-up. Surgical treatment and a combination of anti-inflammatory and surgical interventions in more severe cases seemed to be associated with the best clinical efficacy along with high patient satisfaction.

Between 80% and 90% of patients with HS are active smokers (König et al., 1999). Apart from this being a risk factor (Revuz et al., 2008), accumulating evidence indicates that smoking has a negative effect in the course of HS (Sartorius et al., 2009). Thus, smoking cessation is highly recommended (Zouboulis et al., 2015) and the involvement of an SCS should be systematically considered in patients with HS. Our smoking cessation program proposes individual and group interventions, as well as behavioral therapies, in conjunction with pharmacological treatments (i.e., nicotine replacement treatment; Richmond et al., 1994), varenicline (if necessary), and regular follow-up.

The involvement of a trained primary care nurse, telephone counseling, and the use of motivational interview techniques by health care professionals have been shown to increase attendance rates and elicit patient motivation in primary care settings (Sabate, 2003). The high smoking profile in this cohort, defined as a high daily cigarette consumption and high scores on the Fagerström test, is associated with lower abstinence rates (Lichtenstein and Hollis, 1992; Reichert et al., 2008).

Furthermore, the high levels of depression and anxiety in our cohort negatively influence adherence to smoking cessation treatments (Lichtenstein and Hollis, 1992; Ginsberg et al., 1997; Reichert et al., 2008; Tulloch et al., 2016). In the cohort, patients with HS appreciated the different aspects of patient–clinician interaction, such as empathy, communication skills, and quality of time spent, as demonstrated by the PMH/PSQ-MD score (Barlési et al., 2006). These results highlight the multidimensional nature of adherence, comprising social and economic factors, therapy-related factors, patient-related factors, condition-related factors, and healthcare system factors (Sabate, 2003).

The prevalence of obesity in patients with HS varies from 12% to 88% (Zouboulis et al., 2015). Current data suggest improvements of HS with weight loss (Kromann et al., 2014a, 2014b). Overweight and obese patients need to adhere to evidence-based weight loss methods to lose weight and maintain weight loss in the long term (Acharya et al., 2009). In our cohort, only 30.4% of obese patients attended the consultation with a nutrition specialist. There was

almost no reduction in mean BMI over time (30.1 vs. 30.7). Paradoxically, all overweight and obese patients reported being highly motivated to lose weight (VAS = 7.8 of 10).

In advanced cases, wide excision is one of the mainstays of HS treatment. Different wound closure techniques are possible, but there is no consensus as to which leads to the best outcome (Janse et al., 2016). Our surgical team uses reconstruction by pedicle flaps (e.g., brachial, pudendal, gluteal) in all wide excision cases when primary closure is impossible. This surgical management led to the highest patient clinical improvement and satisfaction scores. Reconstruction with flaps has many advantages. It ensures the best quality skin, owing to thick tissue coverage. Vascular pedicle flaps are particularly reliable for reconstruction of axillary HS defects and allow tightening of the arm tissue and preservation of shoulder mobility (Alharbi et al., 2014; Ching et al., 2017; Unal et al., 2011). Recurrence rates after wide excision were estimated by closure methods in a meta-analysis (Mehdizadeh et al., 2015). These rates were lower with skin flaps or grafts compared with primary closure (15% for primary closure, 8% for skin flaps, and 6% for graft; Mehdizadeh et al., 2015). No study has compared flap reconstruction with secondary intention healing after wide excision in terms of recurrence rate, complications, and quality of healing.

Recent studies support the combined use of surgical approaches and anti-inflammatory treatment for the management of moderate to severe HS (Bu et al., 2017; DeFazio et al., 2016; Van Rappard and Mekkes, 2012). In a retrospective study, initiation of biologics (infliximab and ustekinumab) after wide excision was associated with a reduced recurrence rate and increased disease-free interval (Miller et al., 2014). Adjuvant therapies with anti-inflammatory medications (topical or systemic antibiotics and/or tumor necrosis factor inhibitors) before surgery may lead to less invasive surgery and reduce the risk of complications in Hurley stages 2 and 3 of HS (Van Rappard and Mekkes, 2012, 2016). In the FU subgroup, disease severity after the multidisciplinary approach was only mildly reduced (-6.3 ± 16.2) units in mean MSS). This reduction was mainly noted in the surgical and combined treatment groups.

This study was limited by its retrospective design and small sample size. Another limitation of the study is the limited follow-up rate, which could have inflated the success rates of the therapeutic interventions. The limited follow-up rate further underscores the high medical need in HS and the difficulties in adherence to the multidisciplinary program considering the comorbidities in HS. The heterogeneity of patient characteristics and management proposals limits the generalizability of the treatment-related conclusions, but provides data on the clinical applicability of published guidelines.

Conclusion

To our knowledge, this is the first study describing the organization and implementation of a multidisciplinary program in HS management based on published guidelines. This program supports the management of the many comorbidities associated with HS. An integrated multidisciplinary care model is associated with high patient satisfaction and high-quality patient–physician interactions. The partial compliance of patients with HS with comorbidity management is a limitation to this approach. An established therapeutic alliance between patient and physician prior to addressing comorbidities, such as smoking and obesity, could improve adherence.

Future research in HS management should include multicomponent interventions, including patient education and motivational counseling, to increase compliance in this fragile patient population (Depont et al., 2015). Female patients were more compliant and appreciated empathetic interactions with physicians.

Surgical treatment and combined surgical and anti-inflammatory treatments seem to offer the most promising long-term clinical results. Randomized studies are needed to confirm the relevance of this approach.

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Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

Declaration of Competing Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijwd.2020.02.006>.

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