STUDY

ONLINE FIRST

A Systematic Review of Treatments for Hidradenitis Suppurativa

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Objectives: To conduct a systematic review of the effectiveness of various modalities to treat hidradenitis suppurativa (HS) and to establish recommendations on its appropriate management.

Data Sources: MEDLINE, Cochrane, and PubMed databases.

Study Selection: English-language prospective, retrospective, and case studies describing at least 4 patients with HS.

Data Extraction: Data quality and validity were addressed by multiple reviewers using independent extraction.

Data Synthesis: Studies were categorized as treatments using antibiotics, biological agents, laser surgery, excisional surgery, or miscellaneous modalities. Of 62 publications included in the review, 4 studies met criteria to be assigned the highest grade for quality of evidence.

Conclusions: Shown to be effective treatments for HS were a clindamycin-rifampin combination regimen, a course of infliximab, monthly Nd:YAG laser sessions, and surgical excision and primary closure with a gentamicin sulfate–collagen sponge. Most therapies used to treat HS were supported by limited or weak scientific evidence. A treatment approach is presented based on the evidence and on clinical experience at the Follicular Disorders Clinic, Department of Dermatology, Henry Ford Hospital, Detroit, Michigan. This review emphasizes the need for large randomized controlled trials to evaluate treatment options for HS.

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HIDRADENITIS SUPPURATIVA (HS) is a chronic, inflammatory, recurrent, debilitating skin follicular disease that usually manifests after puberty with painful deep-seated inflamed lesions in the apocrine gland–bearing areas of the body, most commonly the axillary, inguinal, and anogenital regions. The prevalence of HS is estimated to be 1% among the general population.[1-3] Despite this high prevalence, treatment options are limited, and few large-scale randomized controlled trials have explored the safety and efficacy of treatment for HS. Physicians often rely on clinical experience and trial-and-error individualized patient care. A comprehensive review of research studies on HS treatment in the last 20 years is presented, with the aim of providing treatment guidance to physicians.

METHODS

DATA SEARCH

A literature search was conducted using MEDLINE, Cochrane, and PubMed databases from January 1, 1990, to November 1, 2010, to identify relevant English-language publications. Key search terms included *hidradenitis suppurativa*, *acne inversa*, or *Verneuil's disease* in combination with the keyword *treatment*. In addition, references of relevant articles and reviews were manually searched for additional sources. Bibliographies of retrieved publications were reviewed to identify sources not obtained in our search. Two of us (P.V.R. and I.H.) independently reviewed the abstracts to identify articles that met eligibility requirements. Any disagreement was resolved using arbitration by another of us (H.W.L.).

INCLUSION AND EXCLUSION CRITERIA

A study was included if it involved the treatment of HS. Studies that did not exclusively deal

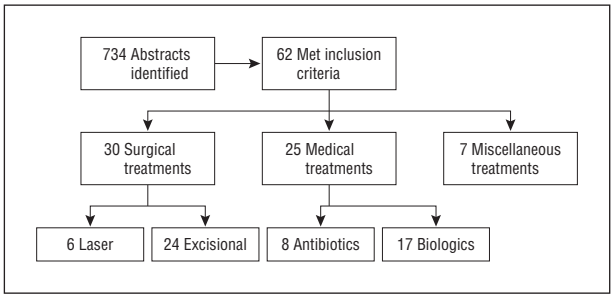

Figure. Results of the systematic review.

with the treatment for HS were excluded. However, if data among patients with HS were presented separately within the study so that the information could be abstracted independent of other data, then the study was included. Editorials and studies describing 3 or fewer patients were excluded. Review articles that mentioned treatments were excluded; however, studies cited within the articles were manually searched for possible inclusion in the review. Studies were excluded if they were not published in the English language (**Figure**).

STUDY SELECTION AND DATA EXTRACTION

Studies meeting eligibility criteria were independently abstracted and reviewed by 2 of us (P.V.R. and I.H.) using predetermined inclusion and exclusion criteria. We then independently graded the strength of the clinical recommendation based on risks, benefits, and costs. Morbidity, mortality, symptom improvement, cost reduction, and quality of life were considered in grading a recommendation.

DATA ANALYSIS

The quality of evidence was assessed based on grading recommendations published in the *Archives of Dermatology*[4] and on evidence quality guidelines for systematic reviews. Studies were classified by treatment category (surgical, medical, or miscellaneous treatments) and listed with their grade for quality of evidence, number of patients treated, treatment intervention, and results (eTables 1, 2, 3, 4, and 5; available at: http://www.archdermatol.com). The grades for quality of evidence were the following: A (systematic review or meta-analysis, randomized controlled trial with consistent findings, or all-or-none observational study), B (systematic review or meta-analysis, lower-quality clinical trial or study with limitations and inconsistent findings, lower-quality clinical trial, cohort study, or case-control study), and C (consensus guidelines, usual practice, expert opinion, or case series). For surgical treatments, grade B was assigned only if a study reported remission rates and focused on a particular procedure or surgical site, as these are clinically relevant variables for the clinician. Grade C was assigned to surgical studies that did not meet the requirements for grade B. A treatment approach was formulated based on results of the systematic review and on clinical experience. *P* values are reported when available for studies assigned grade A or grade B. For articles that did not have a consistent grading scale or were based on usual practice or expert opinion, results were reported as follows: (1) favorable (support the use of the intervention), (2) no improvement (do not support the use of the intervention), or (3) indeterminate (if the study yielded variable results). This terminology allows the presentation of results in a clinically relevant manner when study authors provided anecdotal or clinical consensus data and statistical significance was not reported.

RESULTS

Sixty-two publications met our inclusion criteria and are addressed in this review. Assignment of grade for quality of evidence yielded 4 studies with grade A, 16 with grade B, and 42 with grade C. Most publications that were excluded were review articles, case reports, or case series with a small sample size.

MEDICAL TREATMENTS

Twenty-five of 62 studies reviewed were identified as medical treatments for HS. They were further classified into 2 categories, antibiotics (eTable 1) or biologics (eTable 2).

Antibiotics

Clindamycin-Rifampin. Three of 8 studies used combination treatment with rifampin and clindamycin. Mendonça and Griffiths[5] conducted a retrospective review (grade C) of medical records and identified 14 patients who had received 10 weeks of combination treatment with clindamycin (300 mg) and rifampin (300 mg) twice daily. Eight of these patients achieved remission, and 2 others achieved remission when minocycline was substituted for clindamycin; 4 patients were unable to complete the course of treatment owing to diarrhea. In a more recent retrospective review (grade B), Gener et al[6] described 116 patients who received the same treatment regimen as in the study by Mendonça and Griffiths and reported that, among 70 patients who returned for week 10 evaluations, their disease activity (which was systematically assessed using the score by Sartorius et al[7]) was significantly decreased after treatment, with a median Sartorius score of 14.5 vs 29 before treatment ($P < .001$). Ten of 70 patients experienced adverse effects, mostly nausea, diarrhea, and abdominal pain, with 6 patients stopping treatment because of the digestive symptoms. A similar study (grade B) was performed by van der Zee et al,[8] who looked at different dosing regimens of clindamycin and rifampin and found that the maximum treatment effect occurred within 10 weeks. Nine of 34 patients discontinued treatment owing to adverse effects, with diarrhea being the most commonly reported.

Isotretinoin. Although isotretinoin is a retinoid, it is analyzed under the antibiotics category for this systematic review. Two (grade B) of 8 studies looked at the effectiveness of isotretinoin as a treatment option for HS and found limited or poor efficacy. In a retrospective study of 68 patients, Boer and van Gemert[9] found that the lesions completely cleared during initial therapy in 16 patients (23.5%), with 11 patients (16.2%) maintaining their improvement during a mean follow-up period of 46 months. The authors concluded that monotherapy with isotretinoin has a limited therapeutic effect. Soria et al[10] completed a study of 358 patients with HS; after a mean treatment duration of 7.8 months with oral isotretinoin, there was improvement in 14 patients (16.1%), no change in

67 patients (77.0%), and worsening in 6 patients (6.9%).

Dapsone. In a grade C study, Kaur and Lewis[11] retrospectively assessed the efficacy of dapsone in 5 patients who were refractory to treatment with oral antibiotics and isotretinoin. After 4 to 12 weeks of treatment, all patients showed improvement after receiving doses of dapsone ranging between 25 and 150 mg/d. However, all patients required maintenance treatment to sustain their disease control. No adverse events were noted after a mean follow-up period of 24 months.

Antibiotics vs Antiandrogens. In a retrospective medical record review (grade B), Kraft and Searles[12] identified 64 women with HS and reported that antiandrogen treatment was superior to oral antibiotic treatment (55% response vs 26% response) based on a 2-sample 2-sided *t* test statistic ($P < .04$). The prevalence of polycystic ovarian syndrome among the patients was 12.5% (8 of 64), and it was 38.1% (8 of 21) among those in whom androgen markers were available. The authors advised that hormonal therapy should be considered in all women with HS.

Tetracycline vs Clindamycin Phosphate. In a grade B study, Jemec and Wendelboe[13] described 46 patients with stage I or stage II HS who were treated with systemic tetracycline (1 g/d) or topical clindamycin phosphate, 1%, daily in a double-blind controlled trial; they found no significant difference in efficacy between the 2 treatments. They reported that subjective factors, such as soreness, seemed to be a key factor in patient assessment of the disease and suggested that subjective factors, particularly soreness, should be included as outcome variables in treatment studies.

Biological Agents

Infliximab. Eight studies used infliximab as a treatment regimen for HS. Seven studies[14-19] were assigned grade C owing to small sample sizes of 15 patients or fewer and a case series study design. The study by Grant et al[20] using infliximab was assigned grade A, in which the authors performed an 8-week randomized double-blind placebo-controlled crossover trial. They found that more patients in the infliximab group than in the placebo group showed at least a 50% decrease from their baseline HS Severity Index score. Infliximab was well tolerated, no unexpected safety issues were identified, and improvements were demonstrated in pain intensity, disease severity, and quality of life, with concomitant reduction in clinical markers of inflammation. Adverse effects or a lack of efficacy was reported in 2 studies[16,17] in 8 patients. Fardet et al[16] reported that 5 of 7 patients treated with infliximab showed substantive improvement at week 6. In 3 of 7 patients, adverse events occurred, including abdominal pain caused by colon cancer, multifocal motor neuropathy with conduction block, and a severe allergic reaction. Usmani et al[17] described 1 patient who developed an infliximab-induced lupus reaction, 1 patient who experienced a hypersensitivity reaction to infliximab, and 2 patients who had poor response, despite 3 infusions.

Etanercept. Six studies looked at the role of etanercept in treating HS. Five studies received grade C, and only the study by Adams et al[21] received grade A. In this single-center prospective randomized double-blind placebo-controlled study, 20 patients were subcutaneously administered etanercept (50 mg) or placebo twice weekly for 12 weeks. After 12 weeks, all patients subcutaneously received open-label etanercept (50 mg) twice weekly for 12 more weeks. No statistically significant differences were seen among physician global assessments, patient global assessments, or Dermatology Life Quality Index scores at 12 or 24 weeks between treatment and placebo groups ($P > .05$ for all comparisons). Pelekanou et al[22] reported a prospective open-label phase 2 study in which etanercept (50 mg) was initially subcutaneously administered once weekly for 12 weeks in 10 patients. Three patients responded to the first course of treatment and experienced no disease recurrence. In the other 7 patients, a second course of treatment was needed, with favorable responses in 5 patients and a lack of response in 2 patients. Lee et al[23] performed a prospective clinical trial of etanercept (50 mg/wk) subcutaneously administered in 15 patients with moderate to severe HS and found minimal evidence of clinically significant efficacy of etanercept, with only 3 patients classified as responders. Giamarellos-Bourboulis et al[24] conducted a similar prospective trial using etanercept (50 mg/wk) for 12 weeks in 10 patients. Looking at the primary outcome measured by a disease activity score, 6 patients had more than 50% improvement at week 12, and 7 patients had more than 50% improvement at week 24. A patient-reported visual analog scale assessing improvement showed that only 2 of 10 patients had more than 50% improvement at week 12. A prospective study by Cusack and Buckley[25] of 6 patients given etanercept (50-100 mg/wk) showed improvement in all patients. However, 4 of 6 patients used concomitant antibiotics for disease flares during the study. In a small case series, Sotiriou et al[26] treated 4 patients having severe treatment-resistant HS with etanercept (25 mg) subcutaneously administered twice weekly. All patients had improvement of lesions, with a mean self-improvement rating of 68.75% noted at 6 months, and the only reported adverse effect was a mild infusion site reaction during the first week of treatment.

Adalimumab. The limited available scientific evidence has not shown consistent results supporting the use of adalimumab as a treatment option for HS. A case series[27] (grade C) evaluated 6 patients who were given subcutaneous injections of adalimumab (40 mg) every other week, with a higher dosage ($\leq$40 mg/wk) given for inadequately controlled HS. After 1 month of treatment, significant improvements were seen in the Dermatology Life Quality Index, in basic laboratory findings, and in the numbers of lesions and affected regions; improvements were maintained over a mean follow-up period of 21.5 months. In a slightly larger study (grade B) by Amano et al,[28] clinical improvement was not observed after 12 weeks of treatment among 10 patients in a prospective

open-label phase 2 study in which adalimumab (a 160-mg induction regimen) was subcutaneously administered at week 0, followed by 80 mg at week 1, and then 40 mg every other week for 12 weeks. The median results for the HS Severity Index ($P = .40$), visual analog scale ($P = .55$), Dermatology Life Quality Index ($P = .65$), and physician global assessments of disease severity showed no statistically significant improvement between baseline and at the end of 12 weeks of treatment. However, adalimumab was well tolerated, and no serious adverse events were reported among study participants.

Efalizumab. The results of a single prospective clinical trial[29] (grade C) using efalizumab indicated no favorable outcomes with the use of the drug to treat HS. Five women received efalizumab (0.7 mg/kg/wk) for the first 2 doses, followed by a higher dosage (1.0 mg/kg/wk) for 10 subsequent doses. Patients derived no clinical benefit from the medication, although it is important to note that only 2 of 5 patients completed a full 12-week treatment regimen.

SURGICAL TREATMENTS

Thirty of 62 studies reviewed were identified as surgical therapies for HS. These were further classified into 2 categories, laser surgery (eTable 3) or excisional surgery (eTable 4).

Laser Surgery

Carbon Dioxide Laser. Results of 5 studies (grade B or grade C) suggested improvement in HS using carbon dioxide laser surgery. Lapins et al[2] used carbon dioxide laser in 24 patients with a stepwise horizontal vaporization technique. After a mean follow-up period of 27 months and a healing time of approximately 4 weeks, 22 patients reported no recurrences of HS at the treated areas. Postsurgical results were reported to be satisfactory cosmetically and relative to quality of life. Lapins et al[3] conducted a retrospective follow-up study of 34 patients with initial stage II HS based on clinical staging by Hurley[30] who were contacted by telephone after surgery for follow-up information. Vaporization was usually able to reach the deep subcutaneous fat or fascia. Findings showed a mean healing time of 4 weeks, with 30 patients demonstrating no recurrences in the treated area. However, de novo suppurating lesions (separated from the initial surgical site by >5 cm) developed in 12 patients, and 25 patients had flares in an area other than the treated site. Finley and Ratz[31] treated 7 patients with axillary and inguinoperineal HS using carbon dioxide laser, followed by second-intention healing, and reported only 1 recurrence after a healing time of 4 to 8 weeks. Madan et al[32] used carbon dioxide laser excision to treat 27 sites of HS in 19 sessions among 9 patients. Seven patients reported complete remission for 12 months or longer after their last laser treatment and stopped all HS medications. Two patients reported an axillary scar contracture complication. Hazen and Hazen[33] treated 185 areas in 61 patients using a carbon dioxide laser excision and marsupialization technique. Recurrence occurred at 2 of 185 treated areas during a follow-up period ranging from 1 to 19 years.

Nd:YAG Laser. In a study (grade A) by Tierney et al,[34] Nd:YAG laser was shown to be an effective treatment for patients with stage II to stage III HS. The authors completed a prospective randomized controlled study of 22 patients in which 3 monthly laser sessions were performed on half of the body and results were compared with the other control half. Using a modified Sartorius scoring system, percentage decreases in HS severity after 3 months of treatment were 65.3% for all anatomic sites, 73.4% for inguinal sites, 62.0% for axillary sites, and 53.1% for inframammary sites. This reflected a statistically significant change in HS severity from baseline to month 3 in the treated areas but not at the control sites.

Excisional Surgery

Of 62 studies reviewed, 24 were in the excisional surgery category. One study was assigned grade A, 6 studies received grade B, and the others were given grade C. Because of the difficulties and ethical dilemmas encountered with designing surgical studies, most of the literature on surgical treatments of HS is centered around surgeon experience and preference among various surgical techniques. Recurrence rates and follow-up periods were included if provided by the authors; a 1-year follow-up period was considered optimal. Buimer et al[35] performed the only prospective randomized controlled surgical study with grade A, in which excision was performed and followed by primary closure with or without enclosure of a resorbable gentamicin sulfate–collagen sponge, to evaluate whether the use of antibiotic sponge would reduce the incidence of postoperative infections. The use of a gentamicin-collagen sponge resulted in fewer complications and a shorter mean time until wound healing. An open study (grade B) by van der Zee et al[36] explored the efficacy of a deroofing technique in which the roof of a lesion was surgically removed and the floor of the lesion was left exposed. Of 73 treated lesions, 83% showed no recurrence during a median follow-up period of 34 months, and 17% showed recurrence after a median follow-up period of 4.6 months. Postoperative bleeding in 1 patient was the only reported adverse event, and 90% of patients responded that they would recommend the procedure to other individuals with HS.

An additional 5 studies[37-41] (grade B) looked at the role of radical excision as a treatment option for HS. Bieniek et al[41] described their experience with excision and multiple methods of wound closure over the last 10 years. They noted complete recovery in 59.7% of their patients during a 2-year follow-up period and suggested that the risk of recurrence is related more to the natural course of the disease and the width of the excision than to the closure technique. A statistically significant relationship was shown between the efficacy of a procedure and the number of body areas affected. Bohn and Svensson[37] described their results among 138 patients who underwent radical excision and had follow-up times ranging from 3 months to 21 years. In 38 of 116 patients (32.8%) who completed a questionnaire, the disease recurred to

some degree, and 14 of them required further operation. Rompel and Petres[38] presented the results of 106 patients treated via radical wide excision, with a median postoperative follow-up time of 36 months and a 2.5% rate of recurrence within operated fields. Wound infection occurred in 3.7% of patients, and the overall complication rate was 17.8%, including suture dehiscence, postoperative bleeding, and hematoma. A retrospective study[39] of 31 patients undergoing drainage procedures, limited regional surgery, and radical wide excisions showed 100% recurrence after drainage, 42.8% recurrence after limited excision, and 27% recurrence after radical excision ($P < .05$), with a mean follow-up period of 72 months. Wiltz et al[40] performed a retrospective analysis of 43 patients with perianal HS who underwent wide local excision, or incision and drainage, or limited local excision; results showed that wide local excision was more successful in preventing recurrence of disease.

Of the remaining 17 studies (grade C), 8 studies[42-49] looked at surgical excision of HS, 6 studies[50-55] reported on the use of a various flaps during surgery, 1 study[56] evaluated the use of grafts and flaps, and 2 studies[57,58] documented the results of specific skin grafting techniques. These grade C studies showed variable results and could not be effectively compared owing to the inconsistent and sometimes anecdotal reporting of findings.

MISCELLANEOUS TREATMENTS

Seven of 62 studies reviewed were identified as miscellaneous treatments for HS (eTable 5). All studies received grade C for quality of evidence.

Cryotherapy

Bong et al[59] reported a case series of 10 patients treated with cryotherapy; 8 patients had improvement, with a mean healing time of 25 days and no recurrence of lesions at the treated sites. Adverse events included posttreatment ulceration, infection, or both. Most patients considered cryotherapy a better treatment option than oral antibiotics, and 8 of 10 patients stated that they would consider cryotherapy again in the future.

Photodynamic Treatment

Gold et al[60] reported a case study of 4 patients who underwent 3 to 4 total treatments of short-contact 5-aminolevulinic acid–photodynamic therapy using a topical 5-aminolevulinic acid, 20%, and blue light for activation, with a 3-month follow-up period. All patients had 75% to 100% clinical improvement. Strauss et al[61] reported a case series of 4 patients who had a maximum of 4 treatments of 5-aminolevulinic acid–photodynamic therapy at weekly intervals. None had significant improvement in regional HS scores observed at follow-up visits.

Finasteride

Finasteride (an inhibitor of 5α-reductase type 2) was prescribed in a study[62] as monotherapy (5 mg/d) in 7 patients. Six patients showed significant improvement, and 3 patients demonstrated complete healing. Two patients with follow-up periods continuing longer than 1 year reported remissions lasting 8 to 18 months.

Zinc Gluconate

In a pilot study by Brocard et al,[63] a total of 22 patients with mild to moderate HS were prescribed zinc gluconate (90 mg/d). The authors reported 8 complete remissions and 14 partial remissions; gastrointestinal symptoms were the most commonly reported adverse effect.

Topical Resorcinol

Boer and Jemec[64] performed an open study of 12 women with stage I or stage II HS who self-treated with topical resorcinol, 15%. Patients reported a significant decrease in pain, and the mean duration of painful abscesses was decreased.

Acitretin

A retrospective study[65] was performed of 12 patients who were treated with acitretin (mean dose, 0.59 mg/kg/d) for a mean period of 10.8 months. Nine patients saw marked or complete remission after 1 course of treatment, and 3 patients showed mild to moderate improvement of their condition. Significant adverse effects were seen in all patients, including cheilitis in all patients, as well as dermatitis, hypertrichosis at the chin, sticky skin, depression, fatigue, buzzing in the ears, and photosensitivity in others. The authors reported that half of the treated group were unwilling to undergo a second course of treatment with acitretin.

COMMENT

The lack of randomized controlled blinded studies in treatments of HS often presents physicians with the arduous task of determining an appropriate and efficacious course of treatment for patients. A significant limitation of the review herein is in the surgical treatments section. Owing to the descriptive nature of research in surgical treatments, it is difficult to compare different grading scales and results; as such, extensive meta-analysis is difficult.

Using this comprehensive review as an evidence-based guide, we developed the following working approach for the management of HS. In our experience, Hurley clinical staging is a convenient and useful way to classify patients with HS for disease management and follow-up care. Physical examination should be performed to recognize the extent of disease and to classify Hurley stages in HS[30] as follows: stage I (abscess formation [single or multiple] without sinus tracts or cicatrization), stage II (recurrent abscesses with tract formation and cicatrization [single or multiple widely separated lesions]), or stage III (diffuse or near-diffuse involvement or multiple interconnected tracts and abscesses across the entire area). The nature of this approach is progressive. Many treatments that are suggested for milder stages may also

be used in patients with more diffuse involvement based on the clinician's assessment. For example, a patient with stage II HS may be prescribed topical treatments that are suggested for stage I disease in addition to an antibiotic regimen. After obtaining an extensive medical history, family history, and social history, it is appropriate to culture HS lesions for aerobic and anaerobic bacteria, as well as to obtain nasal swabs in patients refractory to treatment.[66] Appropriate laboratory studies should be considered based on the patient's clinical history. In patients suspected of having hyperandrogen states (polycystic ovarian syndrome),[12] it is prudent to recommend an appointment with an endocrinologist.

The influence of HS on a patient's emotional and psychological state has been shown to significantly affect quality of life and must be addressed by clinicians. Psychosocial factors often affect patient compliance and follow-up care and should be considered by physicians in the decision-making process when developing a therapeutic relationship with a patient and in establishing a workable treatment plan. Matusiak et al[67] showed a statistically significant correlation between the Dermatology Life Quality Index and disease activity ($R=0.67$, $P<.001$). This significant effect of HS on patient well-being may necessitate extensive counseling in a dermatology clinic setting and may warrant referral to a psychiatrist for additional support when deemed necessary. It is important to stress lifestyle changes, including smoking cessation.[1,68,69]

SUGGESTED EVIDENCE-BASED TREATMENT APPROACH

Hurley Stage I and Stage II

Topical clindamycin, 1%, lotion or solution can be used for Hurley stage I mild HS.[13] It is appropriate to consider performing monthly therapy with Nd:YAG laser on the lesions.[34] Carbon dioxide laser treatment is another viable option, showing some efficacy in clinical studies,[2,3,31-33] that should be offered to patients. Oral isotretinoin is not an effective option supported by the scientific literature and should not be initiated in this subgroup of patients.[9,10] Although case series[11,62] involving few patients have reported some efficacy with the use of dapsone or finasteride, no large trials support their use. Zinc gluconate (90 mg) once daily can be offered as an adjunctive treatment to patients, following appropriate counseling about potential gastrointestinal adverse effects.[63] For Hurley stage II, clindamycin (300 mg) in combination with rifampin (300 mg) twice daily may be initiated for 10 weeks.[5,6,8] This regimen must be started in conjunction with a comprehensive patient discussion about potential likely adverse effects, including diarrhea, which may be severe enough to lead to termination of this treatment regimen. Another efficacious option to consider is treatment with Nd:YAG laser for a minimum of 3 to 4 monthly sessions.[34] If the patient is unable to tolerate these treatment regimens or if the disease continues to be refractory to treatment, focus can be shifted to the use of biological agents. Infliximab should be the first-line treatment given the favorable outcomes demonstrated by a randomized double-blind trial[20] and by several case series. One small clinical trial[28] and a case series[27] evaluating adalimumab showed inconsistent results and provided insufficient evidence to recommend treatment for all patients with HS at this time. An ongoing open-label phase 2 study[70] is under way to determine the safety and efficacy of adalimumab in moderate to severe HS. Efalizumab has been shown in a small case series[29] to be an ineffective treatment modality; it was withdrawn from the US market in 2009 owing to its adverse effects. Cryotherapy[59] and photodynamic therapy[60,61] have shown variable results in the literature thus far; they should not be routinely recommended.

Hurley Stage III and Refractory HS

At the level of Hurley stage III HS, a trial of the aforementioned medical treatments that are used for Hurley stage I and stage II disease can be recommended before discussion of surgical options. Although the literature discusses external beam radiation treatment for refractory HS,[71] no strong evidence-based data support this treatment option. In refractory HS or extremely severe cases, it is appropriate to refer patients to a plastic surgeon or reconstructive urologist (for perianal or vulvar disease) to discuss surgical options.

MULTIDISCIPLINARY APPROACH

A multidisciplinary approach using both medical and surgical treatment modalities may be required for successful treatment of HS. Surgical treatments were included in this review to present clinicians with the most comprehensive data available. We recognize that suggestions for surgical procedures and specific techniques may be beyond the scope of recommendations made by dermatologists. However, it is vital that dermatologists should know when it is appropriate to consider a surgical consultation for a patient with HS.

Although progress has been made in the last 20 years of research, most treatment options for HS are largely based on trial-and-error patient care and physician clinical experience. Until additional randomized controlled studies of existing and novel treatments are performed, the evidence-based treatment approach offered in this review will aid clinicians in managing the treatment of HS.

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Online-Only Material: eTables 1 through 5 are available at http://www.archdermatol.com.

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Announcement

Dermatologic Photography Tips: Take Great Publishable Images

Tip: Set your camera to 3 megapixels or greater. If you plan to crop extensively, an even higher resolution is desirable. If using .JPG file type, use the highest quality .JPG setting.[1]

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