**ORIGINAL ARTICLES**

**Hidradenitis Suppurativa. Response to Treatment With Infliximab**

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**Abstract.** Introduction. Hidradenitis suppurativa is a chronic inflammatory disease that runs in outbreaks with painful lesions, fistulas and scars in axillae, groins, buttocks, and perianal and submammary regions. Among multiple drug therapies available, infliximab, usually employed in dermatology to control psoriasis, has shown its efficacy in the past five years.

Patients and method. It is a prospective, observational study to determine the efficacy and safety of infliximab in the treatment of hidradenitis suppurativa. We selected three women with a history of hidradenitis suppurativa of more than 10 years, with involvement of at least two anatomic locations that was recalcitrant to conventional therapies. Each patient received infliximab at a dose of 5mg/kg/infusion on weeks 0, 2, 6 and every 8 weeks thereafter.

Results. Two of the three patients showed mild to moderate improvement of their disease while the third patient did not improve. We can highlight the variability of the results observed in these three patients. Adverse effects were generally mild and well tolerated by the three patients. Despite this, two patients withdrew the therapy due to loss of efficacy in one case and the development of generalized arthralgias in the other case.

Conclusions. Treatment of hidradenitis suppurativa with infliximab constitutes a moderately useful alternative in some cases.

**Key words:** tumor necrosis factor, hidradenitis suppurativa, infliximab.
along with sinus tract formation and scarring. The disease affects mainly the axillae, groin, buttocks, and perianal and inframammary regions (all parts of the body with a high density of apocrine glands). The disease usually presents initially during puberty and is slightly more common in women. It is usually associated with deterioration in the quality of life of the patient, who may become frustrated and depressed, and suffer social isolation and relationship problems. A variety of therapeutic options are available, such as general interventions (weight loss and smoking cessation), pharmacological interventions (antibiotics, isotretinoin, finasteride, prednisone, cyclosporine, etc), surgery (incision and drainage, healing by secondary intention, etc), and other types of intervention (carbon dioxide laser therapy and radiotherapy). In the last 5 years, the efficacy of infliximab has been demonstrated. This chimeric monoclonal antibody acts by inhibiting the proinflammatory effects of tumor necrosis factor alpha (TNF-α). Its efficacy has been demonstrated in a number of dermatological diseases, including psoriasis. We present 3 patients with long-standing active hidradenitis suppurativa resistant to conventional therapy who were treated with infliximab.

**Patients and Methods**

We selected 3 patients with a history of more than 10 years of hidradenitis suppurativa and involvement of at least 2 anatomical sites. In all cases, the disease had been resistant to multiple previous treatments. The baseline characteristics of the patients are shown in Table 1.

Before starting treatment with infliximab, a series of complementary tests were done that included complete blood counts; determination of blood glucose, urea, creatinine, electrolytes, aspartate aminotransferase, alanine aminotransferase, γ-glutamyltransferase, alkaline phosphatase, complete urinalysis, antinuclear antibodies (ANA), anti-extractable nuclear antigen antibodies, and nuclear localizing anti-DNA antibodies; serological tests for the hepatitis B, hepatitis C, and human immunodeficiency viruses; tuberculin test; and chest radiograph.

Infliximab was administered as an intravenous infusion to each patient at a dose of 5 mg per kilogram body weight per infusion at weeks 0, 2, and 6 and then every 8 weeks. The same dose was maintained throughout the study.

The following variables were determined for each patient at the time of each of the infusions:

1. Number, site, and characteristics of the lesions (inflammatory, suppurative, scarring)
2. Severity of symptoms (assessed subjectively by the physician): mild, moderate, severe
3. Frequency of recurrences (number of recurrences per month)
4. Subjective assessment of the disease by the patient on an analogue scale of 0 to 10, with 10 corresponding to the worst state

**Table 1. Baseline Characteristics of the 3 Patients**

<table>
<thead>
<tr>
<th>No./Age/Sex</th>
<th>Duration of Hidradenitis Suppurativa, y</th>
<th>Lesion Site</th>
<th>Prior Treatments</th>
<th>Medical History</th>
<th>Complementary tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/28/Woman</td>
<td>13</td>
<td>Axillae, groin</td>
<td>Topical and systemic antibiotics (clindamycin) Nonsteroidal antiinflammatory drugs Systemic corticosteroids, isotretinoin Oral contraceptives</td>
<td>Dyslipidemia</td>
<td>Normal or negative</td>
</tr>
<tr>
<td>2/29/Woman</td>
<td>15</td>
<td>Axillae, pubis, groin, buttocks, submammary region</td>
<td>Oral antibiotics (doxycycline, cloxacillin, clindamycin) Systemic corticosteroids Multiple surgical drains</td>
<td>Morbid obesity</td>
<td>Normal or negative</td>
</tr>
<tr>
<td>3/41/Woman</td>
<td>15</td>
<td>Groin, buttocks</td>
<td>Topical (mupirocin) and systemic (clindamycin, tetracyclines) antibiotics</td>
<td>Not relevant</td>
<td>Normal or negative</td>
</tr>
</tbody>
</table>

Systemic corticosteroids
Isotretinoin
Oral contraceptives
5. Self-rated analogue overall quality-of-life score (EuroQol instrument), which ranges from 0 to 100, with 100 corresponding to the worst state
6. Subjective assessment by the patient of the degree of discomfort from symptoms (pain, pruritus, etc) on an analogue scale of 0 to 10, with 10 corresponding to the worst state
7. Side effects
8. Skin-disease–specific quality-of-life score (Skindex-29), with higher percentages corresponding to poorer quality of life. This instrument for measuring quality of life was developed by Dr MM Chen in the United States of America, and adapted for Spanish speakers by Dr M Jones-Cabellero. It assesses 3 dimensions or domains (emotional, functional, and symptoms) with 28 items or questions.
9. Overall treatment satisfaction on an analogue scale of 0 to 10, with 10 corresponding to maximum satisfaction and 0 to greatest dissatisfaction

The skin-disease–specific quality-of-life test was only administered at the baseline visit and at the third infusion of infliximab (sixth week) and treatment satisfaction was only assessed at the third infliximab infusion.

In addition, at each infusion, laboratory tests including complete blood counts, glucose, urea, creatinine, electrolytes, aspartate aminotransferase, alanine aminotransferase, γ-glutamyltransferase, and alkaline phosphatase were performed.

### Results

The results for the 3 study patients are presented in Tables 2, 3, and 4 and in Figures 1, 2, and 3. A large variability was apparent in our patients. Patient 1 improved—the number of inflammatory and suppurative lesions and the frequency of recurrences decreased. Therefore her overall disease severity decreased. This patient suffered a mild recurrence of hidradenitis during the last 2 infusions of infliximab. We interpreted this as a decrease in efficacy over time. Figure 2 shows the clinical improvement of this patient with treatment. Subjectively, however, the patient considered her state to be similar to that before treatment (subjective hidradenitis scale), with the same quality of life (EuroQol instrument, Skindex-29), although she was in less discomfort (hidradenitis discomfort scale). In general, this patient was dissatisfied with treatment despite objective clinical

### Table 2. Results for Patient 1

<table>
<thead>
<tr>
<th>Patient 1</th>
<th>1st Infusion (0 Weeks)</th>
<th>2nd Infusion (2 Weeks)</th>
<th>3rd Infusion (6 Weeks)</th>
<th>4th Infusion (14 Weeks)</th>
<th>5th Infusion (22 Weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesions, number</td>
<td>Inflammatory, 15-20</td>
<td>Inflammatory, 15-20</td>
<td>Inflammatory, 15-20</td>
<td>Inflammatory, 15-20</td>
<td>Inflammatory, 15-20</td>
</tr>
<tr>
<td></td>
<td>Suppurative, 5 Scarring, 15</td>
<td>Suppurative, 5 Scarring, 15</td>
<td>Suppurative, 5 Scarring, 15</td>
<td>Suppurative, 5 Scarring, 15</td>
<td>Suppurative, 5 Scarring, 15</td>
</tr>
<tr>
<td>Severity</td>
<td>Moderate</td>
<td>Moderate-mild</td>
<td>Moderate-mild</td>
<td>Mild</td>
<td>Mild</td>
</tr>
<tr>
<td>Frequency of recurrences per month</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Blood tests</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Skindex-29</td>
<td>48.2%</td>
<td>-</td>
<td>40.5%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Treatment satisfaction</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6th Infusion (30 Weeks)</th>
<th>7th Infusion (38 Weeks)</th>
<th>8th Infusion (46 Weeks)</th>
<th>9th Infusion (54 Weeks)</th>
<th>10th Infusion (62 Weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesions</td>
<td>Inflammatory, 10</td>
<td>Inflammatory, 10</td>
<td>Inflammatory, 10</td>
<td>Inflammatory, 10</td>
</tr>
<tr>
<td></td>
<td>Suppurative, 0 Scarring, 15</td>
<td>Suppurative, 0 Scarring, 15</td>
<td>Suppurative, 0 Scarring, 15</td>
<td>Suppurative, 0 Scarring, 15</td>
</tr>
<tr>
<td>Severity</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
</tr>
<tr>
<td>Frequency of recurrences per month</td>
<td>1</td>
<td>1</td>
<td>0-1</td>
<td>0-1</td>
</tr>
<tr>
<td>Blood tests</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Skindex-29</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Treatment satisfaction</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
improvement because her expectations were higher. The patient occasionally suffered asthenia, headache, dizziness, and nausea after the infusions. The laboratory results were normal.

Patient 2 had more severe disease, with more widespread lesions. An objective improvement in inflammatory lesions and a reduction in the severity of the disease were observed with treatment—but to a lesser extent than with the other 2 patients—and the frequency of recurrences remained unchanged. As shown in Figure 3, the lesions were almost identical before and after treatment. Approximately 2 weeks before the fourth infusion (week 14), the patient suffered a severe recurrence of the disease and, given that she was scheduled for bariatric surgery soon afterwards, it was decided by mutual agreement to discontinue treatment. The subjective outcomes got worse—thus, quality-of-life...
Pedraz J et al. Hidradenitis Suppurativa. Response to Treatment With Infliximab

scores and disease assessment and treatment satisfaction scores all decreased. Previous migraine and asthenia also worsened during treatment. In an isolated laboratory test during the third infusion, an ANA titer of 1/160 was documented but this value then returned to normal. Other parameters were normal.

After the first infusion, patient 3 improved with treatment in terms of the number of inflammatory and suppurative lesions, disease severity, and frequency of recurrences. This patient thought that she had improved notably, as reflected by the subjective hidradenitis assessment, and discomfort due to hidradenitis scores and the quality-of-life scales (Skindex-29, EuroQol). Overall, the patient was therefore very satisfied with the treatment. During the treatment period, she reported occasional asthenia and headaches but, after the seventh infusion, she experienced generalized asthenia.
arthralgia, affecting mainly the ankles, knees, wrists, and fingers. She was referred to the rheumatology service and it was decided to suspend treatment until a possible relationship with infliximab infusions had been ruled out. The results of her laboratory tests were normal throughout the treatment period.

Discussion

Ifliximab is a chimeric monoclonal immunoglobulin G1 antibody with a high affinity for TNF-α, a property which enables it to inhibit the proinflammatory action of this protein. Infliximab is currently approved for treating Crohn disease, rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis, psoriasis, and ulcerative colitis, but its efficacy has also been demonstrated in other diseases such as graft versus host disease, Behçet disease, sarcoidosis, pyoderma gangrenosum, and hidradenitis suppurativa. On reviewing the literature, we were able to find as many as 8 reports of patients with hidradenitis suppurativa. In our study, only 1 of the patients (patient 3) suffered a side effect—generalized arthralgia—that required treatment discontinuation. The other 2 patients only experienced mild drug reactions (dizziness, nausea, asthenia, and headache). We also observed a new recurrence of the disease in patient 2, 15 days after the fourth infusion of infliximab.

In addition to the publications on infliximab therapy, further support for the suggestion that TNF-α is implicated in the pathogenesis of hidradenitis suppurativa comes from the study published by Cusack et al in which 6 patients with hidradenitis suppurativa were satisfactorily treated with etanercept at a dose of 25 mg twice a week.

In conclusion, we can affirm that infliximab is a moderately useful treatment in some patients. The optimal regimen may not yet have been determined, and so further studies would be justified.

Conflicts of Interest

The authors declare no conflicts of interest.

References