Plantar focal idiopathic hyperhidrosis and botulinum toxin: a pilot study

Article

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Summary: Botulinum toxin is a safe and effective treatment for idiopathic focal axillary and palmar hyperhidrosis, but very few data are reported in the literature on its effect on plantar idiopathic hyperhidrosis. The current study was undertaken to investigate the impact of BTX-A administration on sweat production and quality of life in patients suffering from plantar hyperhidrosis. Ten patients with idiopathic, recalcitrant plantar hyperhidrosis were included in a pilot study and underwent intradermal injections with 100 MU of BTX-A in the plantar skin, bilaterally. All the patients were followed for 16 weeks after treatment with objective (Minor’s test) and subjective (DLQI test) evaluation. Patients experienced an improvement of symptoms with a significant decrease of Minor’s test and DLQI levels for 12 weeks. No significant side effects occurred in any treated patient. BTX-A seems to be a promising treatment for plantar hyperhidrosis. However, clinical trials on larger patient series are needed in order to evaluate its safety and effectiveness for this application.

Keywords: axillary hyperhidrosis, botulinum toxin type A, palmar hyperhidrosis, plantar hyperhidrosis
evaluate the effect of BTX-A on plantar hyperhidrosis over a period of sixteen weeks after treatment.

**Materials and methods**

A total of 10 patients (5 women and 5 men) suffering from idiopathic plantar hyperhidrosis resistant to any prior topical treatment were included in the study and treated with BTX-A injections. Ethics committee approval was obtained and all patients gave their informed consent. Pregnant or nursing women, as well as patients with secondary hyperhidrosis or neuromuscular changes, and those using systemic medications that could interfere with neuromuscular activity were excluded from this study.

All patients underwent a complete evaluation consisting of clinical assessment, photodocumentation of sweat production and subjective evaluation of disability caused by the symptoms of hyperhidrosis. The clinical assessment included a pre-treatment semi-objective examination of sweat production. Pre-treatment haematological analyses were also carried out to exclude the presence of any systemic disease underlying hyperhidrosis. Visualization of the hyperhidrotic area was obtained using the Minor-iodine-starch test. In this test an iodine solution (2 g of iodine in 10 mL of almond oil and alcohol) is painted on the area of skin to be tested. Once it dries out, fine rice starch powder is applied on it. Sweat production then causes the mixture to turn dark blue, thus making it easy to discern the exact location and extension of sweating in the target zone (sweating grade ranges from 0 to 3).

Subjective evaluation of disability caused by the symptoms of hyperhidrosis was obtained using the Dermatology Life Quality Index (DLQI) [12].

The DLQI is a quality of life measure that can be used across all skin diseases and is also a validated tool to measure the degree of change in longitudinal studies [13], for example to measure the effect of a treatment on the quality of life of patients. It consists of 10 questions regarding work, leisure, daily activities, personal relationships and treatments. Each question has five alternative answers: “very much”, “a lot”, “a little”, “not at all” or “not relevant” with corresponding scores of 3, 2, 1, 0 respectively (the answer “not relevant” is scored as 0, as suggested by Finlay et al. [12]). The results can be easily computed by summing the score of each question, resulting in a global value ranging from 0 to 30. The higher is the score, the greater is the impairment in the quality of life.

During the follow-up period (1, 4, 8, 12 and 16 weeks after treatment) each patient underwent Minor’s test and received the DLQI questionnaire from a clinician external to the study.

**Treatment with botulinum toxin type A**

In all patients the hyperhidrotic area was evaluated by the Minor iodine starch test and then subdivided into squares 1.5 × 1.5 cm (2.25 cm²). Lyophilised botulinum toxin type A (BOTOX®, Allergan, Irvine, California, USA) 100 mouse units (MU), was diluted in 5 mL sterile 0.9% saline solution. A total amount of 100 MU was injected intracutaneously and distributed into each 2.25 cm² area using a single injection with a 30G × 0.30 × 4 mm gauge needle.
Topical anaesthetics such as EMLA (Astra Pharmaceuticals, Westborough, MA) were applied 60 minutes before injection to reduce the discomfort.

**Statistical analysis**

A non parametrical analysis of variance for repeated measurement was used to evaluate DLQI index and Minor’s test values across the points-time. Comparisons between baseline and T1-T16 measurements were performed to evaluate the significant differences across the time. A level of probability equal to 5% was used to assess the statistical significance. Results were expressed as median, 25th and 75th percentiles.

**Results**

Quality of life showed a significant improvement lasting for 12 weeks after treatment: the DLQI index values from T1 to T12 resulted significantly lower than the basal value (table 1)(Table 1)); no significance difference was found between T16 and basal values (table 1).

A significant reduction with respect to the basal value in sweat production resulted from T1 to T8 (table 1); the Minor’s score at T12 and T16 was not significantly different from the basal value (table 1).

**Table 1** DLQI index and Minor’s test in patients treated with BTX-A for plantar hyperhidrosis

<table>
<thead>
<tr>
<th></th>
<th>Basal</th>
<th>T1</th>
<th>T4</th>
<th>T8</th>
<th>T12</th>
<th>T16</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLQI index</td>
<td>19</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>8.5</td>
<td>15</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>25th-75th percentiles</td>
<td>18-20</td>
<td>2-8</td>
<td>2-8</td>
<td>5-9</td>
<td>7-10</td>
<td>14-18</td>
</tr>
<tr>
<td>Comparisons towards the basal</td>
<td><strong>p &lt; 0.01</strong></td>
<td><strong>p &lt; 0.01</strong></td>
<td><strong>p &lt; 0.01</strong></td>
<td><strong>p &lt; 0.05</strong></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>MINOR's Test</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25th-75th percentiles</td>
<td>3-3</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
<td>2-2</td>
<td>2-3</td>
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</table>

**Discussion**

Plantar localization represents a functional problem for patients suffering from hyperhidrosis, since topical treatments (astringents, local antiperspirants, iontophoresis) are usually ineffective and the surgical approach is not recommended [1].

Several data have been published regarding the use of BTX-A in the treatment of palmar [1, 2, 5-7] and axillary hyperhidrosis [1-4, 6, 7], the duration of the anhydrotic effects ranging form 12-20 weeks for palmar sites to 24-32 weeks in axillary sites [8], whereas few data are reported regarding the effectiveness, safety and duration of the effect in plantar zones [9-11].
In the present study, all the patients experienced a clinical improvement after the treatment, with sweat production level significantly lower than baseline until the 12th week after the treatment.

A recent study has demonstrated that a DLQI score of > 10 means that a skin disease is having a very severe effect on the patient’s QoL [14]; in our case-series the median value at baseline was 19, but after treatment also the quality of life showed a great and significant improvement both in the period immediately after it and for the subsequent 12 weeks.

However at T16 all the treated patients experienced symptoms relapse with a significant worsening of life quality.

Vadoud-Seyedi J et al. [9] reported 10 cases of plantar hyperhidrosis treated with injections of 50 MU BTX-A, with 7 patients symptom free for up to 20 weeks. Unfortunately, both the administration of BTX-A and the evaluation of life quality were performed in a different manner, therefore the results of our series cannot be compared to the results of their series.

Nevertheless, data of our pilot study confirm that BTX-A significantly reduces sweat production in plantar hyperhidrosis over a period of 12 weeks after a single treatment session in almost all patients. Moreover the treatment seems to be safe as far as no relevant side effects were detected, especially no transient weakness in neighbouring muscles of treated patients.

The duration of the anhydrotic effects in the plantar zone does not seem to last as long as in any other treated area (e.g. axillae and palms), but the real reason for this difference is not clear.

This is why wide clinical trials are needed, especially to understand the cause of this variation in therapeutic effects and to establish the most appropriate dose for the treatment of this zone.

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References


