Original Articles

Bipolar radiofrequency in the treatment of axillary hyperhidrosis: a pilot study

Radiofrequência bipolar no tratamento da hiperhidrose axilar: um estudo-piloto

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ABSTRACT

Introduction: Hyperhidrosis is the cause of intense suffering and embarrassment. Currently there are many treatments available for this disorder, however none of them offers guaranteed and lasting effectiveness.
Objective: To evaluate the effectiveness of bipolar radiofrequency in axillary hyperhidrosis.
Methods: Five patients were selected using the Minor positive test with clinical, photographic, and histological evaluations before and after the procedure. Six weekly sessions were carried out.
Results: The patients rated the improvement as satisfactory, with some considering it almost complete. The photographic assessment showed negative for the Minor test and the biopsy did not evidence dermal fibrosis.
Conclusion: Bipolar radiofrequency can be considered a safe method, with low complication rates and an excellent additional option in the treatment of hyperhidrosis.
Keywords: hyperhidrosis; sweating; laser therapy; ambulatory surgical procedures

RESUMO

Introdução: *A hiperhidrose gera sofrimento e constrangimento intensos. São diversos os tratamentos disponíveis hoje para tal doença, porém nenhum com eficácia garantida e duradoura.*
Objetivo: *Avaliar a efetividade da radiofrequência bipolar para a hiperhidrose axilar.*
Métodos: *Cinco pacientes foram selecionados a partir do teste de Minor positivo para realização do procedimento com avaliações clínica, fotográfica e histopatológica prévias e após o término. Foram realizadas seis sessões semanais.*
Resultados: *Os pacientes consideraram melhora satisfatória, alguns deles declarando-a quase completa. A avaliação fotográfica demonstrou negativação do teste de Minor, e a biopsia não demonstrou fibrose dérmica.*
Conclusão: *A radiofrequência bipolar pode ser considerada método seguro, com baixas taxas de complicações, e excelente opção adicional no tratamento da hiperhidrose.*
Palavras-chave: *hiperidrose; sudorese; terapia a laser; procedimentos cirúrgicos ambulatórios*

INTRODUCTION

Hyperhidrosis is a challenge to the dermatologist. It occurs due to a hyperfunction of the eccrine gland and is mainly triggered by emotional stimuli. There are several treatments available today, however none of them with guaranteed and long lasting efficacy. [1-4] In most cases control is achieved with topical medications, which is the first therapeutic option. For refractory cases, the methods available are anticholinergic medication, botulinum toxin, cholinergic sympathectomy and therapies with radio frequency and microwave devices. [5-7] Radiofrequency falls into the physical category of treatments. Thermotherapy is an electromagnetic radiation based non-ablative technique, which at high frequency generates heat in the biological tissues. It is capable to convey energy to the deep dermis, without destroying the epidermis. Its mechanism of action in hyperhidrosis is the thermal destruction and necrosis of the sweat glands, thereby generating results in the short term and long run. [3, 5, 8]

OBJECTIVE

A prospective, unicentric pilot study was carried out aimed at evaluating the effectiveness of bipolar radiofrequency for axillary hyperhidrosis.

METHODS

Patients

A prospective, unicentric pilot study was conducted with 5 patients at the Dermatology Department of the Universidad de Mogi Cruzes.

Inclusion criteria: meeting the criteria of Hornberger et al. (Chart 1), evidenced with photographic records of the positive Minor test (Figure 1) and impact on the quality of life with a minimum score of three, according to the scale of subjective assessment of severity of Solish et al.[4] (Chart 2). The candidates for the study received detailed information on the treatment to be carried out and signed the Free Informed Term of Consent. Exclusion criteria were: presence of systemic disease, psychological disorders, pregnancy, hypertrophic scars, keloids and previous treatments.

Figure 1: Minor test before the procedure

TECHNIQUE

Patients were instructed to epilate the armpit with razor or wax on the day before the procedure. Asepsis was carried out with chlorhexidine degerming solution.

The patients were placed in a comfortable position to allow the procedure: dorsal decubitus with the hands below the head.

The parameters set on the Solon LMG® module Pro Lifting Bipolar Radiofrequency device (LMG®, São Paulo, Brazil), which was used in this study were: energy at 50W, and duration of 6 minutes for each armpit. Accordance with the patient's algic tolerance, the energy was reduced by 5W. The tip was moved in a fast and continuous way on a thick layer of glycerin, covering the entire armpit. During the procedure, the temperature was measured using a digital thermometer aiming at keeping it around 42°C (Figure 2). The patients were allowed to return to their routine activities soon after. Six weekly sessions were carried out.

Chart 1: Diagnostic criteria of primary focal hyperhidrosis

Presence of visible and focal sweating, for at least six months without obvious cause, plus two or more of the following features:

- Bilateral and symmetric
- Affects the patients' daily activities
- Frequency higher than once a week
- Onset of hyperhidrosis before 25 years of age
- Positive family history
- Absence of night sweats

Adapted source: Hornberger et al. 2004[2].

Chart 2: Subjective hyperhidrosis severity scale

How do you rate the severity of your hyperhidrosis?

- My sweating is never noticed and never affects my daily activities: 1
- My sweating is tolerable but sometimes affects my daily activities: 2
- My sweating is barely tolerable and frequently affects my daily activities: 3
- My sweating is intolerable and always affects my daily activities: 3

Adapted Source: Solish et al. 2007[4].

Figure 2: Axillary erythema immediately after the application of bipolar radiofrequency

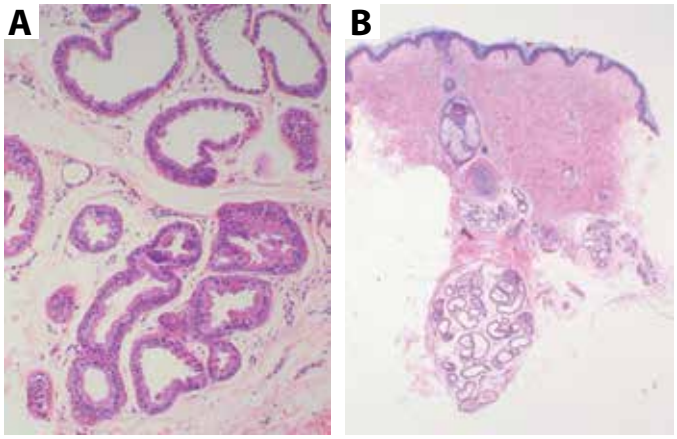

Figure 3: A - Axillary region biopsy demonstrating ectasia of apocrine glands before the procedure; **B –** Greater magnification

EVALUATION

Evaluation methods included the Minor iodine starch test, whose photographic record was carried out with a Canon EOS 450D camera. The study was performed during the winter months, with temperatures of about 27°C e with the patient wrapped in blankets. In addition, the Subjective Hyperhidrosis Severity Scale (adapted from Solish et al.) was used before and 30 days after the treatment. The histopathological evaluation using a 5mm punch was also carried out before the procedure and 30 days after, having been evaluated by the same dermatopathologist physician (Figure 3, A and B).

RESULTS

During the first session, the algic tolerance of patients was low, starting with a 50W potency, subsequently lowering it to 20W. There was an increase of tolerance in the course of the treatment, so that it became possible to operate at a 50W continuously from the third session. In the authors' experience, talking to the patient resulted in increased tolerance. In the first return of the five patients for the second session, all showed a high degree of satisfaction. One of the patients abandoned the treatment due to an upper airway infection picture, feeling unable to proceed. Another patient developed an lesion and abscess in the right armpit, which the authors believe was secondary to a lack of local hygiene, entailing the use of 500mg cephalexin 6/6 hours for seven days, with the procedure being carried out in the contralateral armpit, without prejudice to other sessions. There was greater technical easiness in obese/overweight patients due to the presence of larger amounts of axillary adipose tissue, allowing the tip to better slide. The four patients who completed the treatment reported 90% of satisfaction, and the three who suffered from bromhidrosis reported improvement in the sweating and also in the odor, which could be noticed by the examiner physician and other people accompanying them. Immediate effects noticed were erythema and local warmth in all patients, with three having mild burning (these were thin patients, a fact that implied greater technical difficulty). There was no loss of sensitivity or reduction of hairiness. The second return took place 30 days after the end of the treatment, when the Minor iodine starch test was performed again under the same climatic and environmental conditions (Figure 4), in addition to the subjective research, photographic documentation and new biopsy in the same armpit, which revealed no histological alterations.

The patients continued describing higher than 90% improvements, with the comparative photograph records showing absence of local sweating. At the time this paper was approved for publication, the patients had been followed up for six months with clinical outcomes maintained.

Figure 4: Minor test one month after the procedure

DISCUSSION

Excessive sweating involving sweat glands, that exceeds physiological needs is known as hyperhidrosis and represents an important impact on the quality of life, with limitations at work, in social interaction, in physical and recreational activities.[1-3,7] Efforts therefore are focused on trying to find a treatment whose benefits outweigh the current, and without the side effects of an invasive procedure. Radio frequency is a non-ablative technique that acts through thermotherapy, being among the physical treatment resources. [3, 5, 8] This method consists in beaming electromagnetic waves with higher frequencies, thereby generating heat in biological tissues. Its mechanism of action in hyperhidrosis is the thermal destruction and necrosis of sweat glands. [8, 9] There are several benefits, such as ease of handling, ambulatory procedure, rapid implementation, short sessions, promising results and capacity of reaching the dermis while sparing the epidermis. However, the authors observed epidermal damage during execution of the procedure, such as erythema and micro crusting that showed rapid resolution without developing scars, which probably is due to the fact that this is an area rich in glands. As for the histological evaluation, the objective was to demonstrate the level of dermal fibrosis generated by the thermal effect of the radio frequency, which could not be observed. In the patients' assessment, the improvement regarding the sweating was satisfactory, being considered by some almost complete. From the aesthetic standpoint, the result was described as good, with no retractions being observed. Studies with longer follow-up are necessary in order to better assess the maintenance of results. Although still a novelty, this form of axillary hyperhidrosis therapy using radiofrequency is very promising.

CONCLUSION

Axillary hyperhidrosis is a major challenge to dermatologist physicians, who need to consider the side effects of invasive therapies in light of the ineffectiveness of the conservative ones. The authors consider radiofrequency as a safe method, with low complication rates, and a great additional option. ●

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