Focal Hyperhidrosis of the Anal Fold: Successful Treatment with Botulinum Toxin A

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BACKGROUND Treatment of focal hyperhidrosis with botulinum toxin A (BTX-A) is known to be effective in the axillary, palmar, and plantar region. No studies evaluating the treatment of hyperhidrosis in the anal fold with BTX-A are available, however.

OBJECTIVE The objective was to evaluate whether or not injections with BTX-A are an effective therapy option for the treatment of focal hyperhidrosis of the anal fold.

MATERIAL AND METHODS Eleven male patients (median age, 28.3 years) with focal hyperhidrosis of the anal fold as assessed by modified iodine-starch test were enrolled. Each patient received intradermal injections with 38 U on average (30–54 U) of BTX-A (BOTOX, Allergan Inc.). Changes in sweat rates were documented by comparing the size of hyperhidrotic area in square centimeters before and 4 weeks after injection.

RESULTS The mean reduction of hyperhidrotic area was 29.9 cm^2 (range, 27–43 cm^2), corresponding to a reduction of 78.5%. Apart from painful injections, no side effects were observed.

CONCLUSION BTX-A is an effective therapy for patients with focal hyperhidrosis of the anal fold.

The authors have indicated no significant interest with commercial supporters.

Hyperhidrosis of the anal fold is a rare form of focal hyperhidrosis that mainly occurs in men. Exact epidemiologic data are not available. Excessive sweating may become a severe problem for the patient with possible development of eczema or mycosis due from excessive skin moisture.[1] Moreover, social and professional disadvantages due to visible sweat marks are possible. Therapeutic approaches such as systemic medication with anticholinergics or widespread application of topical agents (e.g., aldehydes or aluminum compounds) are available.[2] Surgical approaches and alternative therapies like iontophoresis have not been described for this special form of focal hyperhidrosis. Although numerous studies have shown the efficacy of botulinum toxin A (BTX-A) injections as a therapy for focal axillary, palmar, and plantar hyperhidrosis, no study investigating this therapy option for hyperhidrosis of the anal fold is available.[3–6] Therefore, using a qualitative, modified iodine-starch test, we investigated the reduction of focal anal hyperhidrosis after BTX-A treatment.

Materials and Methods

Patients and Treatment

Eleven male patients (median age, 28.3 years; range, 25 to 39 years) with primary focal anal hyperhidrosis were enrolled in the study. Patients completed a physical examination at baseline. An in-depth search for systemic causes of secondary hyperhidrosis such as malignancy, infection, hyperthyroidism, diabetes, and endocrinologic screening were negative. Before presenting at our department, all patients underwent unsuccessful conservative

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therapies with aluminum chloride hexahydrate (6%–25% in anhydrous alcohol). Four patients (36%) reported about eczema in their medical history, and 1 patient (9%) was treated for mycosis of the anal fold in the past. Patients received intracutaneous injections with BTX-A (BOTOX, Allergan Inc., Irvine, CA) using a 1-mL syringe (Omnifix-F, B. Braun Melsungen AG, Melsungen, Germany). One vial of BTX-A containing 100 U was diluted with 5 mL of 0.9% saline solution (20 U/mL). We used approximately 0.05 mL (1 U) per injection point, with one injection in a square of approximately 1 × 1 cm. Each patient received intradermal injections with 38 U on average (range, 30–54 U).

Informed consent was obtained from all subjects. The study protocol conformed to the guidelines of the 1975 Declaration of Helsinki.

Modified Minor's Starch Test

For the anal fold, diagnostic procedures such as gravimetry or iodine-starch test are difficult to perform, and standard values for sweating rates (mL/min) are not available. To evaluate the degree of hyperhidrosis and assess therapeutic efficacy, we used a modified iodine-starch test, which was specially designed, considering the anatomic specifics of the anal fold. ISO-A4 copy paper is intermingled with nonpulverized iodine crystal for 5 days in an airproof container (1 g of jodum purum per 50 pages of copy paper).[7] Before application of the prepared paper, the anal fold is completely dried. The paper is folded in the middle and placed in the anal fold of the standing or prone-positioned patient for 60 seconds. The hyperhidrotic area appears on the copy paper, revealing a violet-blue color, similar to the coloring of standard iodine-starch tests. For quantitative sizing, we use a plastic foil with standardized grids (1 × 1 cm) that is copied on the paper enabling an exact measurement of the hyperhidrotic area in square centimeters.[8] By this the extension of sweating areas before and after therapy is clearly visualizable (Figure 1). The test was performed before and 4 weeks after therapy. Patients' satisfaction was evaluated using an analogous scale ranging from 1 to 6 (1 for maximum satisfaction to 6 for no satisfaction at all).

Statistics

Explorative data analysis was performed with computer software (SPSS.12 for Microsoft, SPSS Inc., Chicago, IL). All measurement values of hyperhidrosis were expressed as means ± SD. Analysis of distribution was performed by the Kolmogorov-Smirnov test. Comparisons between the two measurements were performed using the two-tailed *t*-test for paired samples. Differences were considered significant when p values were less than .05.

Results

The mean of hyperhidrotic areas was 38.1 cm^2 (range, 30–54 cm^2) before therapy (Table 1). Four

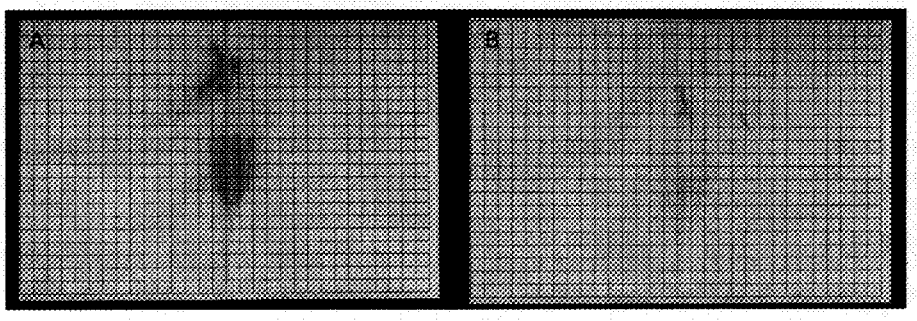

Figure 1. (A) Iodine-impregnated copy paper with 1 × 1-cm grid. Visible, blue-violet sweat marks in a patient with focal hyperhidrosis of the anal fold. (B) Same patient four weeks after intradermal injections with botulinum toxin A (BOTOX). Clearly reduced hyperhidrotic area.

TABLE 1. Hyperhidrotic Areas of the Anal Fold (cm^2) Before and After Therapy with Botulinum Toxin A (BOTOX)*

Age(years)	Hyperhidrotic area before therapy (cm^2)	Hyperhidrotic area after therapy (cm^2)	Amount of reduction (%)	BTX-A (MU BOTOX)	Satisfaction
26	44	10	77.2	44	2
29	54	11	79.6	54	1
33	45	10	77.8	45	3
39	39	9	76.9	39	2
33	37	7	81.1	37	1
28	44	11	75	44	2
39	41	8	80.5	41	1
24	30	6	80	30	1
32	50	12	76	50	2
25	41	9	78.05	41	1
31	32	5	84.4	32	2

*Added are the patient's age, the percentage of reduction, and a satisfaction scale (ranging from 1 to 6 with 1 presenting maximum satisfaction and 6 no satisfaction at all).

weeks after injection, hyperhidrotic areas were significantly reduced to 8.2 cm^2 (range, 5–12 cm^2), corresponding to a reduction of 78.5%. Patients reported a high satisfaction with BTX-A therapy on the analogous scale (mean, 1.5; range, 1–3).

Besides four patients (36.4%) who reported the injections to be painful, no severe side effects were observed during therapy. Despite the anatomical closeness to the anal sphincter, no functional disturbance was observed.

Discussion

Hyperhidrosis of the anal fold may become a severe problem for the patient, including possible social and professional disadvantages due to visible sweat marks.[1] Studies on therapeutic options for this form of focal hyperhidrosis are unavailable. Our clinical experiences, however, show that external application of topical agents (e.g., aldehydes or aluminum compounds) may be an effective therapy in cases of mild hyperhidrosis. If excessive sweating is present topical agents may be inadequate. Contrary to axillary or palmar hyperhidrosis, surgical treatment is not available due to anatomic conditions in the anal fold. Severe hyperhidrosis may therefore be a therapeutic challenge in this anatomical region.

Our results confirm that in these cases injections with BTX-A may be an effective therapeutic approach. In a review of the literature, BTX-A was not described for the treatment of focal hyperhidrosis of the anal fold. There is only one study available that compares traditional BTX-A treatment of muscular spasticity in anal fissures with combined treatment of spasticity and focal hyperhidrosis of the anal fold and perianal skin.[9] Wollina and Konrad[9] used 30 to 50 U of BTX-A for intracutaneous injections of the hyperhidrotic area, leading to higher remission rates of anal fissures and patients' satisfaction compared to intramuscular injection alone. The purpose of the study mentioned, however, was the treatment of muscular spasticity in anal fissures, and data of hyperhidrotic areas or reduction of sweat rates are completely missing.

The amount of BTX-A used in our study was chosen based on our experience in the treatment of axillary hyperhidrosis and the results of Wollina and Konrad. We used 1 U in a square of 1 × 1 cm with a mean dose of 38 U per patient. This amount was sufficient for an effective therapy in our patients, however, in cases of excessive sweating the dosage may need to be increased. The observed mean reduction of the hyperhidrotic area was 78.5% in our patients. This corresponds to data after BTX-A injections for focal

hyperhidrosis of other anatomical sites. Simonetta Moreau and coworkers[6] showed a 78.6% reduction of sweating area in patients with palmar hyperhidrosis 1 month after injection with BTX-A, assessed by Minor starch test.

Patients' satisfaction was very high in our collective, similar to results after injection of BTX-A for different forms of focal hyperhidrosis. Vadoud-Seyedi[5] reported satisfaction in 70% of patients after treatment of BTX-A for plantar hyperhidrosis. Solish and colleagues[10] even reported 90% of patients being satisfied 4 weeks after BTX-A injections for focal axillary hyperhidrosis.[10]

Limiting factors for comparison of reduced sweat rates and patients' satisfaction are given when different forms of methods for evaluation of therapy are used. Patients' satisfaction is sometimes evaluated using analogous scales, whereas other authors prefer standardized questionnaires or just whether the patient is satisfied with BTX-A injections or not. Similarly, reduction of hyperhidrosis is often differently measured in studies. Whereas some authors prefer quantitative tests (e.g., gravimetry) to evaluate therapy, others use qualitative methods (e.g., Minor starch test). Compared to focal hyperhidrosis of the palms or axillae, diagnostic procedures such as gravimetry or iodine-starch test are difficult to perform in the anal fold. Moreover, gravimetric standard values for sweating rates, which exist for axillary hyperhidrosis, are not available. Therefore, we used a modified iodine-starch test with specially prepared, iodine-impregnated copy paper, allowing a measurement of hyperhidrotic area in square centimeters. This modified test has proved to be an effective tool in our clinical routine, both for diagnosis and for therapy control of hyperhidrosis of the anal fold and the submammary region.[11]

In summary, BTX-A injections seem to be an effective treatment option for focal hyperhidrosis of the anal fold, with the iodine-impregnated copy paper being a useful and practical method for evaluating therapeutic efficacy. We did not evaluate long-term results of BTX-A injections for hyperhidrosis of the anal fold, however. Further studies are necessary to assess these data.

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