Financial Disclosure: None reported.


Botulinum Toxin Type A vs Type B for Axillary Hyperhidrosis in a Case Series of Patients Observed for 6 Months

Although botulinum toxin type B (BT-B) is increasingly used for axillary hyperhidrosis, the effective dose is controversial. We compared the antihyperhidrotic effect of intra-axillary injections of BT-B (NeuroBloc; Eisai Europe Limited, Hatfield, Herts, England) and botulinum toxin type A (BT-A) (Botox; Allergan Inc, Irvine, California).

Methods. In a bilateral paired, single-blinded, randomized study, 10 patients (7 women and 3 men; age range, 23-54 years) with idiopathic focal axillary hyperhidrosis since childhood unresponsive to other nonsurgical treatments received BT-A unilaterally and BT-B contralaterally. None of the patients had other diseases or had received previous BT injections during the past year. All patients underwent a pretreatment clinical examination and objective quantification of sweat production at rest. The hyperhidrotic area was defined using the quinizarin sweat test then measured by gravimetric measure over 5 minutes. Patients were assessed before treatment, at 1 and 2 weeks, and at 1, 3, and 6 months after BT injections. The human subjects committee of the Department of Neurology, Citadel Hospital, approved the protocol, and all subjects gave their informed consent.

Each patient was injected in one axilla with 50 U of BT-A diluted with 1 mL of 0.9% sterile physiologic saline without preservative and in the contralateral axilla with 2500 U of BT-B diluted with 0.5 mL of 0.9% sterile physiologic saline without preservative. The identified hyperhidrotic area was pen marked and subdivided into 2×2-cm squares (4 cm²). The toxin was injected in amounts of 0.025 mL (BT-B) and 0.050 mL (BT-A) intradermally using a 30-gauge needle; 20 injections were given in each axilla. All patients received the same amount of toxins divided among the same injection points. Subjective examination included questionnaires eliciting the beginning and duration of benefit and global assessment on a treatment satisfaction scale.

All data are expressed as means (SDs). Paired t tests were used to compare baseline rates of sweat production and area of sweating in the 2 axillae. A nonparametric test for paired data (Wilcoxon test) was used to compare sweat production and area of sweating (percentage change from baseline) and global assessment of treatment satisfaction at each of the 5 considered time points after BT-A and BT-B injection. P < .05 was considered statistically significant. We determined that a sample size of 10 patients would have 94% power to detect the clinically important difference of 10% at α = .05.

Results. All patients reported a reduction in axillary sweat production. Mean (SD) pretreatment sweat production rates and areas were similar bilaterally: rates, 217.0 (22.8) mg per 5-minute interval for BT-A and 206.0 (21.9) mg per 5-minute interval for BT-B; area, 31.4 (5.8) cm² for BT-A and 31.0 (8.1) cm² for BT-B. After BT injections, patients responded to treatment until month 6. At 1 and 2 weeks and 1, 3, and 6 months after treatment, sweat weight and area decreased significantly more in the BT-B side than in the BT-A side (P < .01).

Patients’ treatment satisfaction scores were significantly higher for the BT-B than for BT-A treatment (P < .05) until month 3 (Table). According to patients’ subjective reports, treatment began acting earlier in the BT-B side than in the BT-A side: mean (SD) time to ini-

| Table. Changes in Gravimetric Sweat Production, Colorimetric Areas of Sweat Production, and Satisfaction Scores for Axillae Treated With BT-A and BT-B* |
|--------------------|----------------|----------------|----------------|----------------|
| Measurement Interval | Sweating Weight, % | Sweating Area, % Area | Satisfaction Score b |
| BT-A | BT-B | P Value | BT-A | BT-B | P Value | BT-A | BT-B | P Value |
| 0 d | 100 | 100 | NA | 100 | 100 | NA | 0 | 0 | NA |
| 1 wk | 68.0 (32.1) | 14.9 (20.3) | .01 | 16.9 (6.2) | 6.9 (7.4) | .049 | 1.4 (0.6) | 3.4 (1.3) | .01 |
| 2 wk | 16.6 (9.2) | 4.1 (7.2) | .04 | 10.4 (5.9) | 3.7 (2.2) | .04 | 2.8 (0.8) | 3.8 (0.4) | .046 |
| 3 mo | 13.1 (7.7) | 4.3 (4.1) | .049 | 14.5 (6.5) | 6.1 (4.6) | .047 | 2.8 (0.8) | 3.8 (0.4) | .046 |
| 6 mo | 66.3 (38.4) | 30.6 (24.3) | .03 | 29.5 (8.9) | 17.4 (4.9) | .02 | 2.0 (1.6) | 3.6 (0.5) | .049 |

Abbreviations: BT-A, botulinum toxin type A; BT-B, botulinum toxin type B; NA, not applicable.
*Unless otherwise indicated, data are mean (SD) values.
**The scale score ranged from −4 to +4 and included patients’ description of a 0% reduction or increase in sweating (unchanged) or a mean (SD) reduction of 25% (1%), 50% (2%), 75% (3%), or 100% (4%).

©2011 American Medical Association. All rights reserved.
tial effect, 3.0 (2.8) days (range, 1-7 days) for BT-B vs 14.3 (6.7) days (range, 7-20 days) for BT-A. Anhidrotic areas developed earlier in the BT-B side. Patients reported longer-lasting subjective benefit from BT-B than BT-A: 17.3 (7.4) weeks vs 12.9 (8.4) weeks.

All patients tolerated intradermally injected BT-A and BT-B well, although some experienced mild pain, especially during BT-B injections. No hematomas developed at the injection site, nor did any participant report systemic adverse effects.

Comment. In all patients, although both toxins improved axillary hyperhidrosis, BT-B proved more effective than BT-A in reducing sweat production and area. We therefore provide objective evidence that BT-B is safe and effective for treating bilateral axillary hyperhidrosis. When administered at the same dose ratio of 1:50 used for the motor system, BT-B blocks sweating better than BT-A. The subjective outcome measures, including the beginning and duration of benefit and treatment satisfaction scores, were also higher for BT-B than for BT-A treatment.

Our finding that BT-B effectively reduces axillary hyperhidrosis differs from other studies probably because the other studies used lower toxin ratios (1:40 or 1:20) and higher dilutions. Botulinum toxin type B might strongly reduce hyperhidrosis because it specifically targets the autonomic nervous system, as happens in botulism type B.

Botulinum toxin type B merits increasing use in palmar hyperhidrosis to guarantee long-lasting benefit without hand muscle weakening. Future research should compare how BT-A and BT-B affect the autonomic and motor nervous systems and how long their action on both systems lasts.

Emma Frasson, MD
Francesco Brigo, MD
Michele Acler, MD
Giuseppe Didone, MD
Silvana Vicentini, MS
Laura Bertolasi, MD

Accepted for Publication: July 21, 2010.
Author Affiliations: Department of Neurology, Cittadella Hospital, Padua, Italy (Drs Frasson and Didone); and Department of Neurological Sciences and Vision, Section of Clinical Neurology, University of Verona, Verona, Italy (Drs Brigo, Acler, Vicentini, and Bertolasi).
Correspondence: Dr Frasson, Department of Neurology, Cittadella Hospital, Via Casa di Ricovero 40, Padua 35013, Italy (efrasson@uls15.pd.it).
Author Contributions: All authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Frasson and Bertolasi. Acquisition of data: Frasson, Brigo, Acler, and Vicentini. Analysis and interpretation of data: Frasson, Brigo, Acler, and Didone. Drafting of the manuscript: Frasson, Brigo, Acler, and Vicentini. Critical revision of the manuscript for important intellectual content: Frasson, Didone, and Bertolasi. Statistical analysis: Didone. Administrative, technical, and material support: Brigo, Acler, and Vicentini. Study supervision: Frasson and Bertolasi.

Financial Disclosure: None reported.

Neurogenic Rosacea: A Distinct Clinical Subtype Requiring a Modified Approach to Treatment

Rosacea is generally categorized into 4 distinct clinical subtypes: erythematotelangiectatic, papulopustular, phymatous, and ocular.1 Granulomatous rosacea, rosacea fulminans, and perioral dermatitis have been described as additional variants.2 Herein we describe 14 patients with rosacea and prominent neurologic symptoms, who represent another distinct subset of rosacea meriting a unique approach to management.

Methods. Patients with prominent neurologic symptoms in addition to classic features of rosacea were identified during routine appointments at a major teaching hospital. Details regarding medical history, disease symptoms and triggers, and response to treatments were obtained via clinic visits and telephone interviews. The study was approved by the institutional review board of the University of California, San Francisco.

Results. Twelve of the 14 patients were women, and 12 were white. Mean age at disease onset was 38 years. Prominent symptoms included burning or stinging pain (100% [14 of 14]), erythema (100% [14 of 14]), and flushing (93% [13 of 14]), sometimes accompanied by facial edema (50% [7 of 14]), telangiectasias (50% [7 of 14]), pruritus (43% [6 of 14]), and papules (36% [5 of 14]). Important symptom triggers included heat (93% [13 of 14]), sunlight (93%[13 of 14]), hot showers (79% [11 of 14]), stress (71% [10 of 14]), exercise (64% [9 of 14]), and alcohol consumption (57% [8 of 14]). Use of makeup (50% [7 of 14]), eating spicy foods (43% [6 of 14]), touching skin (36% [5 of 14]), drinking hot beverages (29% [4 of 14]), cold weather (21% [3 of 13]), and humidity (14% [2 of 13]) were less reliable triggers. Notably, 71% of patients experienced relief from cooling via fans or cold compresses or ice applied to the face or held in the mouth (10 of 14). Figure 1 depicts typical examination findings in these patients.

A notably high percentage of patients had neurologic symptoms (43% [6 of 14]) or neuropsychiatric conditions (30% [7 of 14]) conditions, including complex regional pain syndrome, es-