Botulinum Toxin for Hyperhidrosis of Areas Other than the Axillae and Palms/Soles

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KEYWORDS

• Inguinal • Submammary • Facial • Compensatory • Amputee hyperhidrosis • Botulinum toxin

KEY POINTS

- Hyperhidrosis can affect many different areas of the body. Identifying and localizing the specific hyperhidrotic area with starch-iodine testing is important.
- Botulinum neurotoxin-A is an effective and safe treatment option for hyperhidrotic areas of the body.
- Patients should be counseled about their expectations with treatment.
- Injections should be placed at the dermal-subcutaneous junction.
- The dosing and the duration of effect of botulinum toxin are variable, and depend on the location and size of the involved area.

INTRODUCTION

Primary hyperhidrosis (HH) commonly affects the axillae, palms, and soles, but may occur on many body sites including the scalp, face, submammary regions, and groin (**Table 1**).[1,2] There are limited treatment options available for HH of areas other than the axillae and palms/soles. Although topical treatments are usually considered the first-line therapy, botulinum neurotoxin-A (BoNT-A) is an effective and safe treatment option for most hyperhidrotic areas of the body. This article focuses on BoNT-A treatment of hyperhidrosis of areas other than the axillae and palms/soles. Areas that are commonly affected, such as the face and groin, and less common areas like the submammary region and gluteal cleft, are discussed. Frey syndrome, compensatory sweating, and postamputation stump hyperhidrosis are also discussed.

PATIENT EVALUATION OVERVIEW

A thorough HH history and review of symptoms should be obtained from the patient, including age of onset of HH, location and symmetry of sweating, aggravating/alleviating factors, prior treatments for HH, family history of HH, and current medications that may exacerbate the condition. A physical examination should also be performed to help rule out a possible secondary cause of HH and to localize the affected area. A starch-iodine test is then performed to identify the dimensions of the involved area for treatment.

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Table 1
Most common body sites of hyperhidrosis in a North American population

Body Site	Percentage of Patients
Axilla	73.0
Palms	45.9
Soles	41.1
Face or scalp	22.8
Groin	9.3
Other[a]	9.6

[a] Other includes sites such as the chest, back, abdomen, arms, or legs.

Data from Lear W, Kessler E, Solish N, et al. An epidemiological study of hyperhidrosis. Dermatol Surg 2007;33(s1): S69–75.

The Minor starch-iodine test is an inexpensive and simple procedure commonly used to localize focal areas of sweating. The starch-iodine test does not correspond with the severity of disease, and it may not be possible to illicit a response at every visit. Before performing this test, every patient should be asked about allergies to iodine. To perform the Minor starch-iodine test, the affected area is first thoroughly dried, then a solution of iodine in castor oil is brushed onto the skin and allowed to dry. In addition, corn starch powder is sprinkled on top, and the area is observed for a few minutes. A modified starch-iodine test is more commonly used in clinical practice and generally a povidone-iodine–based surgical preparation, such as Betadine, is used instead of the iodine-castor oil solution. Purple-black dots develop when sweat interacts with the starch and iodine (**Fig. 1**). The treating practitioner can then use a marking pen to create evenly spaced injection markings as a template for BoNT-A injections.

MANAGEMENT GOALS AND BOTULINUM TOXIN PREPARATION

The goals of BoNT-A therapy are to provide a long-lasting reduction in excess sweating, with the smallest effective amount of BoNT-A, and with minimal side effects. It is important to manage patient expectations so that there is an understanding that the goal is improvement in excess sweating, but that complete anhidrosis is rarely achieved. Risks of the procedure should be reviewed and an informed consent obtained. The authors have patients, or their representatives, review and sign a consent form before each treatment session. Most patients undergo repeated treatments over the years, and an untoward effect could occur with any injection session.

The only BoNT-A approved by the US Food and Drug Administration for axillary hyperhidrosis is onabotulinumtoxin-A (ona-BoNT-A; Botox [Allergan, Irvine, CA]), and it is the most common BoNT-A used off-label for hyperhidrosis of all involved areas. Abobotulinumtoxin-A (abo-BoNT-A; Dysport [Ipsen Ltd, Slough, Berkshire, UK]) has also been used effectively for hyperhidrosis. Ona-BoNT-A and abo-BoNT-A are not bioequivalent, and there is no consensus on the ideal conversion factor between these two preparations. The ratio of efficacy in axillary and palmar hyperhidrosis ranges from 1:1.5 to 1:3 for ona-BoNT-A/abo-BoNT-A,[3–5] and is unknown for other forms of hyperhidrosis. Incobotulinumtoxin-A (Xeomin, Merz Pharmaceuticals, Frankfurt, Germany) is a newer BoNT-A that has been shown to be effective in axillary and palmar hyperhidrosis in several studies,[6] and has been shown to be of equal efficacy to ona-BoNT-A for palmar hyperhidrosis in a single study.[7] We have the most experience with ona-BoNT-A for hyperhidrosis, and typically use it to treat patients with hyperhidrosis.

For axillary HH, the recommended reconstitution of ona-BoNT-A is with 4.0 mL of 0.9% nonpreserved saline, although we prefer to use preserved saline, which does not affect ona-BoNT-A efficacy.[2] The dilution volume of 4.0 mL allows for 2.5 units of ona-BoNT-A to be injected in a volume of 0.1 mL. Other volumes of diluent can be used for toxin reconstitution. In general, the more dilute the solution, the more diffusion of the drug that occurs, and this should be taken into consideration.[8] Injections are usually performed with a 1-mL Luer-Lock syringe and 30-gauge 12.5-mm needle. The drug should be placed at the dermal-subcutaneous junction, which is where the sweat glands reside, and this injection depth also minimizes the risk of diffusion to deeper muscles. In general, the needle is inserted into the skin at an oblique angle to maintain the superficial placement of the drug, and to minimize any loss of the botulinum solution. A small amount of blanching may be seen when BoNT-A is injected properly into the dermis.[2]

CRANIOFACIAL HYPERHIDROSIS

Primary hyperhidrosis of the scalp most commonly displays one of 4 patterns: the forehead; a band-like distribution around the scalp, known as the ophiasis pattern; a combination of the forehead and ophiasis scalp; or the entire scalp and forehead.[2] Less commonly involved areas include the upper lip, cheeks, nose, and chin. Several areas can be involved simultaneously.[2] With the exception of Frey syndrome, primary HH is not