The Use of Neurotoxins in the Male Face

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KEYWORDS

• Male aesthetics • Botulinum toxin • Male • Injections • Sex factors • Facial muscles

KEY POINTS

- Men have unique aesthetic goals, expectations, facial anatomy, and aging processes and thus require a tailored approach to botulinum toxin injections.
- Men have more skeletal muscle mass and produce greater facial movements than women and thus generally require a higher number of units of botulinum toxin.
- Approaches for the upper face are better supported by literature than for the lower face, but more studies are needed to further investigate gender differences.

INTRODUCTION

Injection of neurotoxin remains the most commonly performed cosmetic procedure in the United States, with 7.1 million cases being performed in 2016.[1] Although men have consistently comprised 6% of the proportion of these patients, the total number has grown by 355% since the year 2000, with 428,542 injections of neurotoxin being performed in men in the year 2015.[2] Because of this increase, providers have become more cognizant of the need to tailor their consultation and injection technique to male patients. Men have unique goals, expectations, facial anatomy, and aging processes. However, few clinical studies have evaluated gender differences in botulinum toxin dosing, technique, efficacy, and safety. This article serves as a guide for practitioners who provide injectable neurotoxins to men.

GOALS AND EXPECTATIONS IN MALE PATIENTS

Men generally seek cosmetic procedures in order to appear youthful. In an online survey of 600 men aged 30 to 65 years, Jagdeo and colleagues[3] found the main reason respondents would consider a facial injectable were to look good for their age and to look more youthful. Another survey, conducted by the American Academy of Facial Plastic and Reconstructive Surgery, showed that "looking younger, work-related concerns," and wanting to improve competitiveness were the main reasons men pursued cosmetic procedures.[4] Because it is minimally invasive and requires no down time, botulinum toxin is an especially attractive procedure for men who wish to appear more youthful.

The pretreatment consultation is essential in preparing for a successful outcome and satisfied patient. Some men come in for a particular concern or are seeking enhancement, whereas others desire a general antiaging consultation. Therefore, it is important to ascertain the patient's concerns and aesthetic goals. A physical examination should also be performed during the visit, assessing the patient from frontal and oblique views at rest and during facial expression, taking note of baseline asymmetries, presence of static

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and dynamic rhytides, and muscle mass. In addition, educate the patient on the recommended procedures, possible adverse events, and expectations. Explain that there is increased patient satisfaction with continued retreatment, and that although dynamic rhytides are most responsive, static lines can improve with repeated injection.[5] Also, review interventions other than botulinum toxin that may be necessary to achieve optimal results, such as fillers, lasers, skin-tightening procedures, chemical or cold lipolysis, and surgery.

It is important to advise patients on common side effects, like transient edema, erythema, and bruising. Men specifically may be more likely to develop ecchymoses. Men undergoing facial plastic surgery have a higher incidence of postoperative hematoma,[6] which may be explained by the findings that, on the face, men have higher blood vessel density, more microvessels, increased perfusion via Doppler, and larger hair follicles.[7–9] In our practice, we use a 0.3-mL BD syringe with a 31-gauge, 8-mm needle (Becton Dickinson Labware, Franklin Lakes, NJ). For sensitive patients, a 32-gauge needle can provide more comfort than a 30-gauge needle.[10]

BOTULINUM TOXIN TYPES

Botulinum toxin is produced by *Clostridium botulinum*, an anaerobic, gram-positive, spore-forming rod. The bacterium produces 8 distinguishable neurotoxins. Although both types A and B are currently US Food and Drug Administration (FDA) approved, only type A toxin has indications for cosmetic use (**Table 1**). The toxin is composed of a 100-kDa heavy chain and a 50-kDa light chain, linked by a disulfide bridge.[11] The heavy chain binds the presynaptic neuron, allowing entry of the light chain into the cytoplasm. The light chain in turn binds and deactivates a component of the soluble *N*-ethylmaleimide–sensitive factor attachment protein receptor (SNARE) complex. A functioning SNARE complex is needed to release stored acetylcholine from the presynaptic neuron. Botulinum toxin types A and B have different targets within the SNARE complex.[12]

Aside from a unique mechanism of action, each commercially available type of neurotoxin has unique composition, complexing proteins, manufacturing, dosing, and clinical efficacy. Products are available in different vial sizes and can be reconstituted to various concentrations. Because of these dissimilarities, there is no standardized dose-response equivalence between different botulinum toxin products. The area of diffusion of botulinum toxin widens with increasing volume and concentration. Studies have shown that the field effect (action halo on muscular and sweat gland activity) is comparable among the various products if using equal volumes and equipotent doses.[13] The approximate dose conversions in **Table 1** have been obtained from experimental studies and consensus guidelines.[13–17] For the remainder of this article, recommended doses are based on onabotulinumtoxinA (OBA), unless otherwise specified.

Although the body of literature comparing different botulinum toxin types is growing, the study

Table 1
Botulinum neurotoxin type A

Generic Name	OnabotulinumtoxinA	AbobotulinumtoxinA	IncobotulinumtoxinA
Brand Name	Botox (Botox Cosmetic, Allergan, Irvine, CA)	Dysport (Galderma Pharma SA, Lausanne, Switzerland)	Xeomin (Merz Pharmaceuticals, Frankfurt, Germany)
Mechanism	Synaptosomal-associated protein 25 (SNAP-25)	SNAP-25	SNAP-25
Aesthetic FDA Indications (Approval Year)	Glabella (2002) Lateral canthal lines (2013) Forehead lines (2017)	Glabella (2009)	Glabella (2011)
Vial Sizes	50 U 100 U	300 U	100 U
Reconstitution Volume (Concentration)	2.5 mL for 100 U vial (4 U/0.1 mL)	3.0 mL (10 U/0.1 mL)	2.5 mL for 100 U vial (4 U/0.1 mL)
Relative Strength (OnabotulinumtoxinA/Product)	1:1	1:2–1:3 (likely closer to 1:2)	1:1