

Botulinum Toxin Type A for Forehead Wrinkles in Asian

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Abstract

Botulinum toxin Type A (BTA) is the most popular nonsurgical aesthetic treatment worldwide. With the constantly evolving injection techniques, what was considered state-of-the-art 5-10 years ago are no longer represents the standard approach. The indication and dosages of botulinum toxin injection vary among different ethnic group. The consensus and guidelines for Caucasian population may not be applicable to Asian patients. Different dilutions, dosages and injection techniques to forehead have been practiced. The aim of this article is to describe the techniques in the Asian consensus agreement and author's personal experience. The main objectives are to avoid complications and help reaching clinical efficacy.

Keywords: Botulinum toxin; Wrinkles; Injection

Pharmacology

BTA is the neurotoxin protein produced by *Clostridium botulinum* that acts on the neuromuscular junction axon, resulting in reversible decrease in muscle contraction. Currently, there are only three U.S. FDA-approved BTAs on the market: IncobotulinumtoxinA (Xeomin, Merz Pharmaceuticals), OnabotulinumtoxinA (Botox, Allergan) and AbobotulinumtoxinA (Dysport, Galderma). However, the indication of ameliorating the forehead wrinkles is an off-label use for both IncobotulinumtoxinA and AbobotulinumtoxinA. The onset of action is 2-4 days for IncobotulinumtoxinA, whereas 3-5 days for OnabotulinumtoxinA & AbobotulinumtoxinA. In current, IncobotulinumtoxinA is the only BTA with no accessory proteins. The duration of effects for all three BTAs is around 3-4 months. The conversion ratios for these three BTAs are determined in consensus and review publications. In general, the ratio is 1:1 for IncobotulinumtoxinA and onabotulinumtoxinA. For IncobotulinumtoxinA or onabotulinumtoxinA to abobotulinumtoxinA, a ratio of 1:2.5 is commonly agreed on. Dosages are adjusted according to individual muscle activity and muscle mass. Injection Points (IPs) are based on the muscle shape and desired outcome.

Injection Technique

Frontalis muscle elevates the eyebrow and is the only elevator muscle in the upper face. Contraction of the frontalis muscle leads to the development of horizontal forehead wrinkles. The main objective is to reduce the forehead wrinkles and at the same time preserve the eyebrow shape and position. Asians dislike lateral brow arching which conveys anger. Incorrect injection dosage and sites may create "Spock

eyebrow" which is undesirable. Medial and/or lateral eyebrow ptosis is a common pitfall for forehead BTA injection. We should also avoid overdosing to minimize frozen appearance (plastic-like) [1]. The IPs are sometimes misled by the eyebrow position. Due to the frequent modification of eyebrow shape, it is unreliable and unfavourable to focus on eyebrows as a cutaneous landmark. We should be based on muscle mass and bony landmarks instead. Check the eyebrow height, frontalis strength, skin elasticity and asymmetry before injection. The dosing depends on the age, gender, ethnic group, muscle mass, muscle distribution, aesthetic objective of treatment, degree of muscle activity and prior treatment in the area. Muscle mass of frontalis in Asians is considerably lower than in Caucasians, probably due to genetic factors or less facial expressions. The total dosage for Asian female is around 4-20 U with an average around 6-8 U. The consensus is 1-2 rows with 4-6 IPs/row, 0.1-2 U/IP. Author usually uses 0.5 U-1 U/IP depending on the muscle distribution and the desired effect. The injection depth is intramuscular injection. We should avoid restriction of treatment to the medial portion of the muscle and should extend the injection sites far enough laterally to avoid excessive elevation of the lateral part of the eyebrow. We should place IPs 2 cm above the supraorbital ridge to avoid eyebrow ptosis [2]. There is an increasing trend of intradermal botulinum toxin (mesotoxin) injection. Intradermal injection has been described as a strategy to preferentially target the superficial portions of the underlying muscle without impairment of function. IPs are 0.8-1.0 cm intervals into the skin or just below that into the superficial fibres of the facial muscles [3].

Conclusion

BTA injection to forehead is widely practiced. There are many factors that influence *botulinum* toxin treatment and an updated evidence-based approach to optimize *botulinum* toxin treatment outcomes are advised. Depending on the desired clinical outcome, individualized pre-treatment assessment is needed.

References

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