

Complications and Side Effects of Botulinum Toxin for Cosmetic Use

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ABSTRACT

Botulinum toxin, the causal agent of botulism, is employed in therapeutic settings for a number of purposes. Botulinum toxin injections address aesthetic issues induced or worsened by muscle contraction by controlling local neurotransmission. Therapy has a transient impact; muscle recovery is generally clinically visible a few months following treatment. Improper injection placement or toxin diffusion to unintended locations following injection might result in severe muscular weakening, which can cause temporary deformity or functional problems. Some aesthetic flaws, such as eyelid ptosis and a perplexing brow, can be corrected with therapeutic procedures. In other circumstances, progress is contingent on the botulinum toxin's declining action over time.

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INTRODUCTION

Botulinum toxin is an injectable neuromodulator generated from neurotoxins produced by the bacteria *Clostridium botulinum*, which causes botulism. Botulinum toxin weakens or paralyzes skeletal muscle by inhibiting neurotransmission between peripheral nerve terminals and muscle fibers. Botulinum toxin injection, which was originally used for medical purposes, has now become one of the most popular procedures in face rejuvenation.^{1,2}

Botulinum toxin injection, when used correctly, is an overwhelmingly safe method for improving cosmetic defects caused or exacerbated by muscle contraction, such as prominent glabellar rhytides. Botulinum toxin has a short duration of action; muscle function usually recovers to normal within a few months.³

SIDE EFFECTS AND COMPLICATIONS

Botulinum toxin for aesthetic applications appears to be quite safe when individuals are carefully screened and suitable dose and injection method is used.⁴ The most common side effects are mild and transient swelling or bruising at the injection site, mild headache, or flu-like symptoms.⁵ Muscle function impairment may also occur, but this is usually due to poor injection technique or poor patient selection.⁶ A conservative approach to treatment is recommended because smaller doses are less likely to cause unintended side effects. Botulinum toxin diffusion occasionally causes effects on muscles or glands adjacent to the targeted musculature. Toxin diffusion in the upper face can cause highly unpleasant side effects that last for 2 to 12 weeks, such as brow ptosis

(excessive weakening of the frontalis muscle) and eyelid ptosis.⁷ Furthermore, a perplexed or "cockeyed" appearance ("Mr. Spock" brow) can result from preferential weakening of the medial frontalis muscles, allowing unaffected lateral frontalis muscle fibers to elevate the lateral brow. Diplopia, ectropion, lower eyelid droop, epiphora (excessive tearing), decreased strength of eye closure, and dry eye are some of the other side effects that can occur in the upper face.⁸

Complications of therapy in the lower face generally entail impacts on muscular function and facial expression. These side effects are mainly caused by using excessive amounts or injecting into the wrong places. When injections are placed too close to the mouth, injections are performed in the mental fold, or botulinum toxin interacts with the orbicularis oris muscle, flaccid cheek, incompetent mouth, asymmetrical smile, and loss of the ability to whistle are more likely to occur. High dosages administered in the neck region might cause dysphagia and neck flexor weakness.⁹

Praclonidine drops, taken two to three times each day until resolution, can help to improve eyelid ptosis. This frequently results in a 1 to 2 mm elevation of the eyelids. The lateral frontalis musculature can be injected to correct the perplexing brow. Other functional side effects that cannot be alleviated with compensatory therapy resolve when the botulinum toxin's impact fades.¹⁰

An examination of the botulinum toxin data indicates an exceptional safety record. Injection site responses, headache, localized facial paralysis, muscular weakness, flu-like symptoms, dysphagia, respiratory compromise, cardiac arrhythmia, seizure, visual abnormalities, and allergic

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reactions were among the significant side effects described.^{11, 12}

Although the risk of major adverse effects is minimal with cosmetic usage, aspiration, dysphagia, pneumonia, allergy, botulism, and mortality have been documented with botulinum toxin use.¹³

Because botulinum toxin has a transient impact, patients will require further therapy to maintain their progress. A retrospective analysis of over 4000 treatments in 945 individuals treated for upper facial wrinkles looked at the safety of repeated botulinum toxin therapy. Patients required to have experienced at least three consecutive therapy cycles. Only minor to severe side effects were observed, with bruising and ptosis being the most prevalent. Furthermore, the rate of adverse effects reduced with repeated injections, a finding that has been observed in investigations of botulinum toxin type A's medicinal usage. In large open label studies, repeated injections of abobotulinumtoxinA were also well tolerated.¹⁴

The commercially available preparations of onabotulinumtoxinA, abobotulinumtoxinA, and prabotulinumtoxinA are complexed with clostridial proteins, which may affect their immunogenicity. Although several studies have connected antibody production against botulinum toxin to decreased treatment effectiveness, this phenomenon appears to be uncommon, particularly in individuals treated for aesthetic reasons. Only 11 people displayed seroconversion in a meta-analysis of randomized trials and open label studies published between 1999 and 2007, out of 2240 patients treated with onabotulinumtoxinA for a variety of purposes (including 718 patients treated for glabellar lines). Only three individuals had a lack of response to therapy after converting to seropositivity, and none of them were treated for strictly cosmetic reasons.¹⁵

CONCLUSION

Injecting the lowest effective doses with the longest possible intervals between injections may reduce immunogenicity. Because incobotulinumtoxinA is devoid of complexing proteins, its immunogenicity may differ from that of previously available complexed products.

REFERENCES

- I. Pavone, F., & Luvisetto, S. (2010). Botulinum neurotoxin for pain management: insights from animal models. *Toxins*, 2(12), 2890-2913.
- II. Park, M. Y., & Ahn, K. Y. (2021). Scientific review of the aesthetic uses of botulinum toxin type A. *Archives of Craniofacial Surgery*, 22(1), 1.
- III. Matarasso, S. L. (1998). Complications of botulinum A exotoxin for hyperfunctional lines. *Dermatologic surgery*, 24(11), 1249-1254.
- IV. Carruthers, J., Fagien, S., & Matarasso, S. L. (2004). Consensus recommendations on the use of botulinum toxin type A in facial aesthetics. *Plastic and reconstructive surgery*, 114(6), 1S-22S.
- V. Cox, S. E., & Adigun, C. G. (2011). Complications of injectable fillers and neurotoxins. *Dermatologic Therapy*, 24(6), 524-536.
- VI. Wollina, U., & Konrad, H. (2005). Managing adverse events associated with botulinum toxin type A. *American journal of clinical dermatology*, 6(3), 141-150.
- VII. Klein, A. W. (2002). Complications and adverse reactions with the use of botulinum toxin. *Disease-A-Month*, 48(5), 336-356.
- VIII. Carruthers, A., & Carruthers, J. (2006). Advanced Cosmetic Use of Botulinum Toxin Type A. In *Advanced Techniques in Dermatologic Surgery* (pp. 39-58). CRC Press.
- IX. Carruthers, J., & Carruthers, A. (2003). Aesthetic botulinum A toxin in the mid and lower face and neck. *Dermatologic surgery*, 29(5), 468-476.
- X. Nestor, M. S., Han, H., Gade, A., Fischer, D., Saban, Y., & Polselli, R. (2021). Botulinum toxin-induced blepharoptosis: Anatomy, etiology, prevention, and therapeutic options. *Journal of Cosmetic Dermatology*, 20(10), 3133-3146.
- XI. Magid, M., Finzi, E., Kruger, T. H. C., Robertson, H. T., Keeling, B. H., Jung, S., ... & Wollmer, M. A. (2015). Treating depression with botulinum toxin: a pooled analysis of randomized controlled trials. *Pharmacopsychiatry*, 25(06), 205-210.
- XII. Baldo, B. A. (2016). *Botulinum Neurotoxins. In Safety of Biologics Therapy* (pp. 559-585). Springer, Cham.
- XIII. Fan, T., Frederick, R., Abualsoud, A., Sheyn, A., McLevy-Bazzanella, J., Thompson, J., ... & Wood, J. (2022). Treatment of sialorrhea with botulinum toxin injections in pediatric patients less than three years of age. *International Journal of Pediatric Otorhinolaryngology*, 111185.
- XIV. Rzany, B., Ascher, B., & Monheit, G. D. (2010). Treatment of glabellar lines with botulinum toxin type A (Speywood Unit): a clinical overview. *Journal of the European Academy of Dermatology and Venereology*, 24, 1-14.
- XV. Naumann, M., Boo, L. M., Ackerman, A. H., & Gallagher, C. J. (2013). Immunogenicity of botulinum toxins. *Journal of neural transmission*, 120(2), 275-290.