

The botox in dentistry, a review study

Abstract

The use of Botox is a minimally invasive technique of treatment and is giving quite promising results in the management of muscle-generated dental diseases like Temporomandibular disorders, bruxism, clenching, masseter hypertrophy and used to treat functional or esthetic dental conditions like deep nasolabial folds, radial lip lines, high lip line and black triangles between teeth. The Botox has been administered usually by dermatologists and neurologists, although the administration of Botox lies within the dentistry field as Dentistry covers all knowledge of head and neck. The general concept of using Botox is limited to esthetic and cosmetic enhancements. Nowadays, many dentists worldwide are providing botulinum toxin (Botox) to patients.

Aim: This review study explores the potential uses of Botox related to Dentistry and facial problems. This study review is showing the true therapeutic uses of this deadly neurotoxin “Botox”, specifically in treating dental problems.

Literature review: Out of the sixteen studies, a conclusion can be made about the great promises that Botox have for regular dental clinical practice. The authors of these studies concluded that botulinum toxin could be used as an effective treatment option for many facial myopathies, myofascial pain and facial cosmetics. Conclusion: Botox can be used in dental clinic. More Evidence-based researches are needed on this topic to discover more benefits of Botox in Dentistry. These researches will give more confirmation that botulinum toxin is safe and reliable for routine clinical use in Dentistry.

Keywords: botox, advances in dentistry, hypertrophy, facial pain, temporomandibular disorders, bruxism, and clenching.

Special Issue - 2018

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Received: September 16, 2018 | **Published:** November 16, 2018

Introduction

The Botulinum toxin can be considered as a neurotoxin present in nature. It is produced by the Clostridium botulinum Bacteria. Botox is the most commonly known commercial name for the Botulinum toxin.¹ It is a strong toxin because as little as 30–100 mg can be theoretically fatal. Ingesting of a few milligrams of such toxin in contaminated food can cause severe illness or even death to humans, animals, and birds.² Once the toxin reaches the cytoplasm of the nerve cells, the toxin prevents the release of acetylcholine. This stops the nerve signal and paralysis may occur. By the 2002, the FDA accepted the Allergan’s Botox cosmetic for the resolution of momentarily deleting the facial lines. For several years, many physicians also have used Botox “off-label” (without FDA approval) in treating some other medical problems.³ Those injections obviously diminish those seriousness of motor contraction-induced abnormal head position and accompanying with neck pain. Also in 2000, the FDA accepted BoNT/B as a treatment for cervical dystonia in the patients who developed BoNT/A resistance. Since that time, BoNT/A has been accepted for the decrease of the deep glabellar lines in the face. FDA accepted the use of specifications for BoNT/A and BoNT/B.⁴ Nowadays, many dentists worldwide are providing the botulinum toxin (Botox) to their patients. The following is a review of the scientific literature about benefit of Botox in Dentistry problems.⁵

Aims

This review study explores the possible uses of Botox related to

Dentistry and facial diseases. The Botox has been administered usually by dermatologists and neurologists, although the administration of Botox lies within the dentistry field as Dentistry covers all knowledge of head and neck. The general concept of using Botox is restricted to esthetic and cosmetic enhancements. This study review is showing the true therapeutic uses of this deadly neurotoxin “Botox”, specifically in treating dental problems

Methodology

Inclusion criteria

Researches that contain Dentofacial Applications of Botulinum Toxin Injections as:

- i. TMJ disorders
- ii. Bruxism
- iii. Oromandibular dystonia
- iv. Muscle spasm
- v. Clenching
- vi. Oral Surgery and Implant Dentistry
- vii. The Gummy smile
- viii. Hypertrophy in Masseter muscle

Exclusion criteria

Researches that contain Applications of Botulinum Toxin

Injections other than Dentofacial ones

Literature review

Botox has been used by dentists worldwide to treat various dental problems:

In treatment of bruxism

Bruxism means grinding or clenching of the teeth. It is generally because of mental stress and can occur both nocturnally and diurnally. Bruxism might prompt to tooth wear, headaches, periodontal disease and Temporomandibular Joint disorders. Intraoral appliances have been used to treat Bruxism. However, those intraoral appliances might not a chance to be protected to kids. Different medicines have included behavioral therapy procedures to decrease pressure. The injection of the Botox into both masseter as well as temporalis muscles bilaterally had been effective in treating Bruxism.^{6,7} In 1990, nitty gritty checked diminishing in bruxism after implantation of BoNT/A into the masseter and temporalis muscles in a patient recouping from a state of insensibility.⁸ Muscle shortcoming (facial shortcoming) is a known unpredictability for the treatment in this district as a result of the dissemination of arrangement over the facial planes.⁹ This new Botox treatment gives assistance for four - a half year or now and again, may prompt aggregate goals of bruxism. Botox Side impacts incorporate soreness at the infusion site and gentle dribbling.¹⁰ Botulinum neurotoxin has shown ensure in decreasing the signs of bruxism.⁸ Ivanhoe et al. detailed accomplishment with a 200 U measurement of BoNT/A of every a different cerebrum damage case report.¹¹ A long haul, open-name primer examination with a previous history of serious bruxism who were recalcitrant to restorative and dental strategies, to them BoNT/A mixtures were surrendered to the masseters (mean measurement: 61.7 U/side; go 25 U to 100 U), which results in an aggregate span of helpful reaction of 19 weeks.¹²

In treatment of sialorrhea

Sialorrhea can be characterized as overabundance salivation creation or the failure to hold the spit in the mouth. It very well may be caused by numerous neurological issue including cerebral paralysis, amyotrophic parallel sclerosis and Parkinson's ailment. Anticholinergic medication substances (glycopyrrolate, propantheline and scopolamine) used to be the primary line of treatment for this issue. Lamentably these anticholinergic medications have unfavorable symptoms, for example, clogging, urinary maintenance, tiredness, touchiness and laziness. When Botox is injected into the salivary glands, the condition improved. This reduces production of saliva. Adverse effects of Botox therapy include slight xerostomia, dysphagia and chewing difficulties.¹⁰

In treatment of asymmetrical smiles

Facial asymmetries may happen due to over activity of one of the depressor labii inferioris. No treatment options were proved successful until Botox was used. Botox can be injected into the overactive muscle fibers of the depressor labii inferioris (the muscle responsible for the asymmetry of the lower lip) and then Botox will cause a gentle relaxation of the muscle resulting in a symmetrical smile.¹³

In treatment of salivary fistula

Salivary fistula is a typical entanglement following the careful evacuation of parotid tumors (parotidectomy). Most fistulae may close suddenly, persistent fistulae are difficult to be dealt with. An infusion of Botox in the nearness of the parotid organs causes blockage of the

parotid emission. This causes a decline in the salivary stream, trailed by glandular decay, enabling the salivary fistula to recuperate.¹⁴

In treatment of oromandibular dystonia

Oromandibular dystonia is muscle brokenness in the face. This brokenness meddles with talking and biting and it might prompt accidental jaw opening or shutting, horizontal deviation and projection. Development of the masticatory muscles frequently results in automatic staying quiet, cheek or lips.¹⁵ Oromandibular dystonia has reacted well to Botox treatment by infusing Botox into the masseter, medial or lateral pterygoids.

In treatment of hemifacial spasm

Fits of the muscles innervated by the facial nerve may cause Hemifacial fit on the ipsilateral side of the face. It is more often than not because of pressure of the nerve by encompassing veins. Botox infusion into these muscles has given alleviation to the patients experiencing hemifacial fits. There are some impermanent symptoms, for example, erythema, ecchymosis, dry eyes and facial muscle shortcoming.¹⁶

In treatment of masseteric hypertrophy

There is a reciprocal or one-sided easy swelling of these muscles of rumination and this hypertrophy is frequently connected with bruxism. Past treatment was careful evacuation of the average greater part of the muscle by an extraoral or intraoral approach. Inconveniences of this treatment incorporate dangers related with general anesthesia, postoperative drain, edema, hematoma, disease, scarring and facial nerve harm. Botox infusion into the masseter muscles gives an impermanent denervation of the muscles and after that muscle decay will happen. The atrophy may last from 3 to 18 months and repeated injections are required.^{17,18}

In treatment of temporomandibular disorder (TMD)

The disorder can be subdivided into two groups pain caused by the muscles of mastication and pain attributed the temporomandibular joint (TMJ). The common treatments are the uses of anti inflammatory agents, muscle relaxants and narcotics. There are Other treatments like orthotic devices, physiotherapy exercises, drug treatments (antidepressants), massage and acupuncture and intra-articular steroid injection. The Botox injection into the muscles of mastication (the temporalis, masseter, and medial and lateral pterygoid muscles) shows great results in improving the condition.¹⁹ Muscular relaxation with Botulinum toxin A is a viable alternative. When a muscle relaxant is used with the muscles of mastication, this clenching reflex can be reduced or eliminated.²⁰ Because a very small percentage of available force is required to masticate food, a slight relaxation of muscle function reduces bruxing and is usually insufficient to affect chewing and swallowing.²¹

In treatment of temporomandibular joint (TMJ) dislocation

TMJ dislocation is a dislocation from temporomandibular joint, and the mandible is usually locked in an open position. The common method of treatment is manual manipulation, this may require general anesthesia or sedation. The pterygoid muscles usually cause dislocation of the TMJ. The injection of Botox into lateral pterygoid will give good results due to the atrophy and weakening of these muscles.^{19,22}

Conclusion

As evidenced by the previous literature review, Botox can be a valuable addition to the dentistry clinic. A dentist now can provide Botox injections to treat various conditions. Since dentists' training and knowledge covers everything about the head and neck, dentists can use Botox Injection to treat such problems of the face and oral cavity with the proper training specifically related to Botox. Botox is a successful treatment for many facial and oral musculature dysfunctions because it provides an overall conservative, quick and painless approach. Patients do not have to suffer from the problem of surgeries because the minimally invasive technique of Botox injection is available in the Dentist office. Botox also provides reversible temporary approach that can be stopped at any time. The isolation of newer strains of CI. Botulinum is needed and more researches should be done to discover and improve the medical and dental benefits of Botox.²³ Treatment with botox is certifiably not a changeless choice not at all like other careful options. The impact of this treatment is for here and now ordinarily for a half year and the patient needs to get it revamped after that. It is imperative to note here that infusion of botox ought not be given rashly before the impact of prior treatment has worn off totally as this can result in development of antibodies to botox that will weaken the impact of further medications .additionally the treatment may at some point create deviated results because of infusion at wrong site or by an unpracticed clinician and the expense is likewise high for such a treatment.

Acknowledgements

None.

Conflict of interest

The author declares there is no conflict of interest.

References

1. <http://emedicine.medscape.com/article/325451-overview>
2. Montecucco C, Molgó J. Botulinum neurotoxins : revival of an old killer. *Current Opinion in Pharmacology*. 2005;5(3):274–279.
3. Meunier FA, Schiavo G, Molgo J. Botulinum neurotoxins: from paralysis to recovery of functional neuromuscular transmission. *J Physiol (paris)*. 2002;96(1-2):105–113.
4. Bhidayasiri R, Truong D. Expanding use of botulinum toxin. *J Neurol Sci*. 2005;235(1-2):1–9.
5. Nayyar P, Kumar P, Nayyar PV, et al. Botox: broadening the horizon of dentistry. *Journal of Clinical & Diagnostic Research*. 2014;8(12):ZE25-ZE29.
6. Monroy Philip G. The use of botulinum toxin A in the treatment of severe bruxism in a patient with autism: a case report. *Special Care in Dentistry*. 2006;26(1):37–39.
7. See SJ, Tan EK. Severe amphetamine-induced bruxism: treatment with botulinum toxin. *Acta Neurologica Scandinavica*. 2003;107(2):161–163.
8. Van ZM, Marchau MM. Treatment of bruxism with botulinum toxin injections. *J Neurol Neurosurg Psychiatry*. 1990;53(6):530.
9. Shaari CM. Quantifying the spread of botulinum toxin through muscle fascia. *Laryngoscope*. 1991;101(9):960–964.
10. Fuster Torres MA, Berini Aytés L, Gay Escoda C. (2007). Salivary gland : application of botulinum toxin for the treatment of sialorrhea. *Med Oral Patol Oral Cir Bucal*.2007;12(7):E511–E517.
11. Ivanhoe CB, Lai JM, Francisco GE. Bruxism after brain injury: Successful treatment with botulinum toxin-A. *Arch Phys Med Rehabil*. 1997;78(11):1272–1273.
12. Tan EK, Jankovic J. Treating severe bruxism with botulinum toxin. *J Am Dent Assoc*. 2000;131(2):211–216.
13. Benedetto AV. Asymmetrical smiles Corrected by botulinum toxin Serotype A. *American Society for Dermatologic Surgery*. 2007;33(s1):S32–S36.
14. Lai ATY, Chow TL, Kwok SPY. Management of salivary fistula with botulinum toxin Type A. *Annals of the College of Surgeons of Hong Kong*. 2001;5(4):156–157.
15. Bhidayasiri R, Cardoso F, Truong DD. Botulinum toxin in blepharospasm and oromandibular dystonia: comparing different botulinum toxin preparations. *European Journal of Neurology*. 2006;13(s1):21–29.
16. Frei K, Truong DD, Dressler D. Botulinum toxin therapy of hemifacial spasm: comparing different therapeutic preparations. *European Journal of Neurology*. 2006;13(s1):30–35.
17. Kim HJ, Yum KW, Lee SS, et al. Effects of botulinum toxin Type A on bilateral masseteric hypertrophy evaluated with computed tomographic measurement. *Dematologic Surgery*. 2003;29(5):484–489.
18. Baş B, Özcan B, Muğlalı M, et al. Treatment of masseteric hypertrophy with botulinum toxin: A report of two cases. *Med Oral Patol Oral Cir Bucal*. 2010;15(4):49–52.
19. Bhogal PS, Hutton A, Monaghan A. Review of the current uses of Botox for dentally-related procedures. *Dental Update*. 2006;33(3):165–168.
20. Gobel H, Heinze A, Heinze KK. Botulinum Toxin A is effective in cases of oromandibular dysfunction even if previous bite splint therapy has proved unsuccessful. *Cephalalgia*. 2001:514–515.
21. Freund B, Schwartz M, Symington JM, et al. The use of botulinum toxin for the treatment of temporomandibular disorders: Preliminary findings. *J Oral Maxillofac Surg*. 1999;57(8):916–921.
22. Dai J, Yu H, Zhu M, et al. Injection of botulinum toxin A in lateral pterygoid muscle as a novel method for prevention of traumatic temporomandibular joint ankylosis. *Journal of Medical Hypotheses and Ideas*. 2014;9:5–8.
23. Chen S. Clinical uses of botulinum neurotoxins: current indications, limitations and future developments. *Toxins (Basel)*. 2012;4(10):913–939.