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Botox in Periodontics - A Brief Review

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ABSTRACT

In this era, the passion to look beautiful has evolved various new technologies to enhance and improve the physical appearance of people. Botox is emerging as one such popular treatment to improve the facial appearance. Botox can enhance aesthetics and is used therapeutically in other medical conditions. The Botox is a minimally invasive technique and may prove out to be an attractive alternative to surgery in some cases.

Keywords: *Botulinum Toxin Treatment, Mechanism of Action, Advantages, Disadvantages.*

INTRODUCTION

Famous nineteenth century physiologist Claude Bernard, in his publication described the use of poisons as 'a means for the destruction of life or as agents for the treatment of the sick'. The botulinum toxin, also called as the "miracle poison," is one of the most poisonous biological substances known, it is a neurotoxin which is produced by the bacterium *Clostridium botulinum*.² Currently, and Botox is a magic word in the modern world of cosmetic skincare. The botulinum toxin is an alternative treatment modality working through chemo denervation method in many medical and dental conditions.

Botulinum toxin is used in dentistry for the treatment of conditions, such as gummy smile, immediate loading implants, parafunctional habits such as clenching, extracapsular myogenic temporomandibular disorder, trismus, and the associated headaches, and is a new option for symptom relief in patients in whom conventional treatments are not effective.

Botulinum toxin that is available in the market for therapeutic purposes is purified exotoxin of the anaerobic bacteria, clostridium botulinum. Serotype A is the only commercially available form of botulinum toxin for clinical use. Two preparations of botulinum toxin A exist: Dysport® and Botox®. Evidence is emerging about development of other serotypes: B, C, and F preparations.²

HISTORY

BOTOX has been approved by the Food and Drug Administration (FDA) for therapeutic treatments of³

- Eye Muscle Problems (in 1989)
- Neck Problems (in 2000)
- The FDA approved Allergan's BOTOX Cosmetic for the purpose of temporarily erasing facial lines {in 2002}

USES OF BOTOX

Botulinum toxin type A can be used in following dental conditions:-

1. Gummy smile⁴
2. Immediate loading implants⁶
3. Temporomandibular joint disorders⁶
4. Bruxism⁶
5. Mandibular spasm⁵
6. Pathologic clenching⁵
7. Masseteric hypertrophy⁴

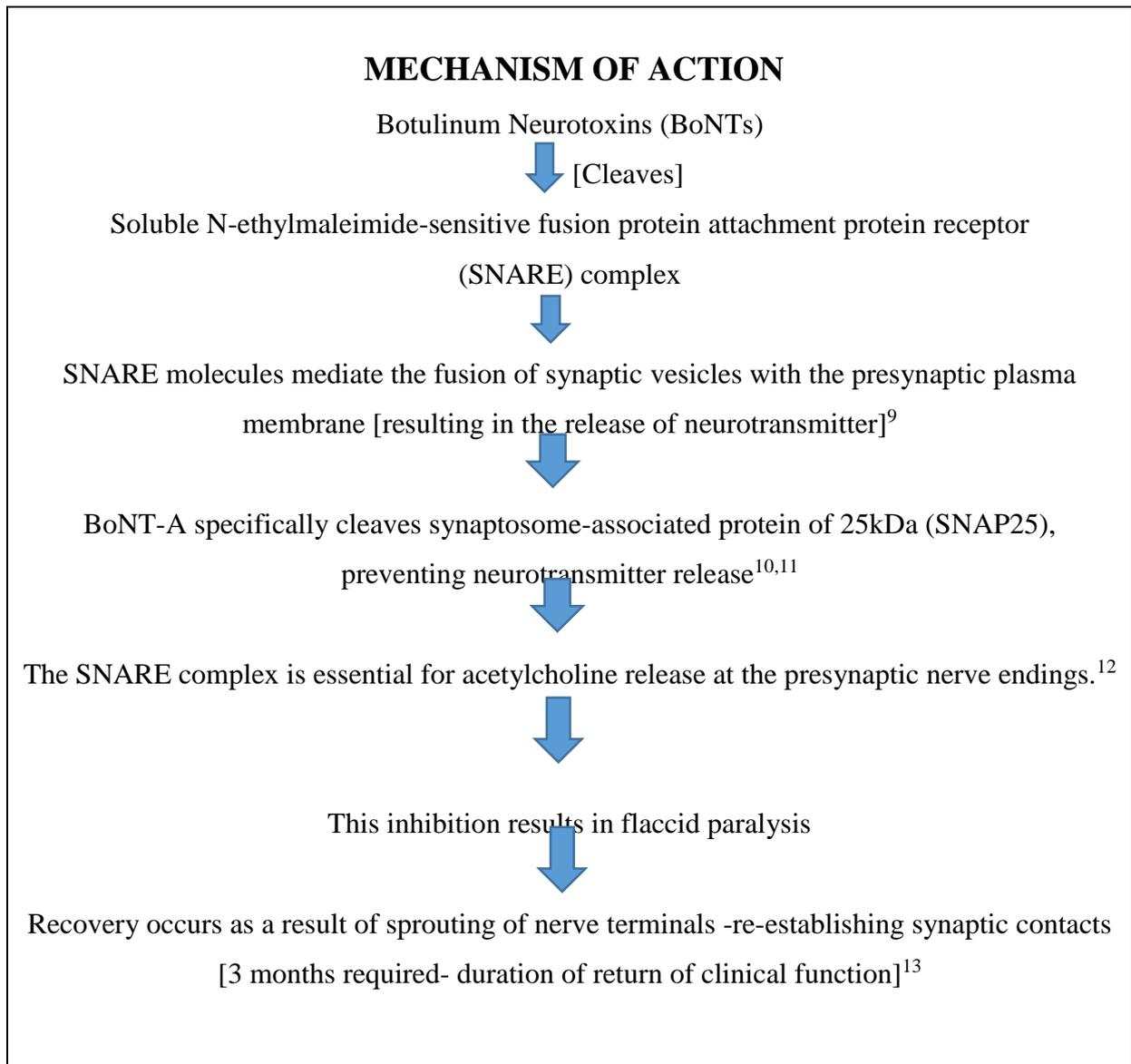
GUMMY SMILE⁵

Botox is indicated when the gummy smile is due to hyper-functional upper lip elevator muscles (muscular capacity to raise the upper lip is higher than average). Injecting Botox temporarily paralyzes the muscles responsible for the elevation of the upper lip, thus avoiding the excessive display of gingiva.

Muscles responsible for elevation of upper lip-

1. Levator labii superioris (LLS)
2. Levator labii superioris alaeque nasii (LLSAN)
3. Zygomaticus major (ZM)
4. Zygomaticus minor (ZM)
5. Depressor septii.

Mario Polo has advocated injection of botox at. Levator labii superioris (LLS), Levator labii superioris alaeque nasii (LLSAN), Levator labii superioris (LLS) / Zygomaticus muscles (ZM) overlap and in severe cases at depressor nasii & orbicularis oris (OO) also. The ideal dosage might be 2.5 U per side at the LLS & LLSAN, 2.5 U per side at the LLS/ZM sites, and 1.25 U per side at the OO sites.¹⁴



Hwang et al: Have proposed an injection point for botulinum toxin-A, and named it as YONSEI POINT and they recommend a dose of 3U at each Yonsei point.¹⁵

Yonsei point is located at the centre of the triangle formed by:

1. Levator labii superioris [LLS]
2. Levator labii superioris alaeque nasi [LLSAN]
3. Zygomaticus minor [Zmi]

BRUXISM⁶

Van Zandijcke and Marchau¹⁶ gave one of the earliest reports on the use of botulinum toxin types A for bruxism. Bruxism is a parafunctional habit, leading to the excessive grinding of teeth due to hyperactivity of masticatory muscles. Botulinum toxin type A injections into the temporalis and masseter muscles, inhibits the nerve impulse transmission to this muscle thus causing temporary paralysis of these muscles and in turn helps in successful treatment of patients with severe bruxism.³

IMMEDIATE LOADING IMPLANTS^{6, 17, 18}

Osseointegration of implants can be impeded by hyperactivity of muscles of mastication. The muscular relaxation with botulinum toxin type a injection to the masticatory muscles can be therapeutically beneficial by allowing implants better unimpeded osseointegration and fracture healing in a more stable environment.

TEMPOROMANDIBULAR JOINT DISORDERS⁶

Temporomandibular disorder (TMD) is a term used to describe a number of diseases affecting masticatory function including true pathology of the temporomandibular joint as well as masticatory muscle dysfunction.^{19,20}. It manifests with facial pain, joint sounds, headache, Peri-auricular pain, neck pain, and/or decreased jaw excursion.

Common etiologic factors of TMD include a myogenic component²¹ and muscular spasticity secondary to bruxism, external stressors, Oro-mandibular dystonia, and psychomotor behaviors. TMDs which are caused primarily due to excessive biting occlusal forces are conventionally been treated with intraoral appliances, occlusal splints, dental restoration, and/or surgery. These techniques are invasive, irreversible, and expensive for the majority of patients. Thus muscular relaxation with botulinum toxin A is a viable alternative. Clenching reflex can be reduced or eliminated after administration of Botox into the muscle responsible for causing it²². A slight relaxation of muscle function reduces excessive clenching and it usually does not affect chewing and swallowing, as a very small percentage of available force is required to masticate food.²³

Advantages⁶:

1. Non-surgical and noninvasive treatment modality.
2. Quick results are seen in 3-5 days, after the day of injection.
3. Botox therapy has a short recovery time.
4. Botox therapy is less expensive than other cosmetic treatments.
5. Dramatic reduction in fine lines and delay in aging process

Disadvantages:

1. Unlike other surgical alternatives, treatment with Botox is not a permanent option.
2. Migration of the botulinum toxin to the levator palpebrae superioris muscle can cause temporary upper lid or brow ptosis in 1-3% of patients.²
3. Patients receiving injections into the neck muscles for torticollis can develop dysphagia due to diffusion of the toxin into the oropharynx.²
4. The effect of this treatment is short term usually for six months and the patient has to get it redone.
5. Bruising can be seen at the injection sites immediately after the treatment.²
6. Botox is contraindicated in patients with diabetes, neurological or cardiovascular problems.
7. Injection of Botox should not be given prematurely before the effect of earlier treatment has worn off completely as this can result in buildup of antibodies to Botox that will dilute the effect of further treatments.⁷
8. The treatment might sometime produce asymmetrical results due to injection at wrong site or by an inexperienced clinician and the cost is also high for such a treatment.⁷
9. Other side effects include pain, allergy, and double vision. Certain side effects like influenza-like illness and brachial plexopathy²⁴, which may be immune mediated are rarely seen .²

CONCLUSION

Botulinum Toxin has successfully upgraded itself from being a sausage poison to being a wonder drug. Botox has emerged as one of the fastest and efficient treatment modality with a minimum invasive technique for various esthetic and therapeutic purposes in modern times. With rapid advances in research, Botox will further enhance its potential use in the ever expanding field of dental esthetics.

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