



Botox in Dentistry: Palliative Side of a Toxin

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ABSTRACT

Botox primarily has been used in cosmetic treatment, but it also has a history of medical therapeutic uses. It can be used as an alternative treatment option working through the process of chemo – denervation in various oral procedures. It is a minimal invasive technique and may prove to be beneficial alternative to surgery in few cases. Use of botox is promising in management of muscle generated dental diseases. Aim of this review is to explore and elaborate the healing side of this toxin.

Keywords: Botox, Toxin, Botulinum, Minimal invasive

INTRODUCTION

The botulinum toxin from which “BOTOX “ is derived has a long history of its therapeutic application other than the cosmetic line of treatment. Use of botox is increasing in dentistry due to its therapeutic effect in the management of certain oral lesions and conditions. Use of botox and dermal fillers by the dentist has been approved by the New Jersey state board and by the Michigan board of dentistry.

Clostridium botulinum produces about seven botulinum neurotoxin serotypes such as A, B, C1, D, E, F and G. Although these toxins are lethal, but it has an effective and powerful medication potential [1, 2]. For the medical and cosmetic application currently available botulinum toxins are:

Botulinum toxin type A- Botox, Xeomin, Dysport.

Botulinum toxin type B- Myobloc.

At present, minimally invasive dentistry is in demand. One such option for minimal invasive treatment for several dental conditions is botox.

Botox has wide range of application in the field of dentistry [3], such as:

- Temperomandibular joint disorders
- Dental implants and surgery
- In treatment of gummy smile
- Orthognathic defects corrections
- Trigeminal neuralgia
- Myofacial pain distress syndrome
- Pathologic clenching
- Bruxism
- Massetric hypertrophy.

OVERVIEW ON BOTULINUM TOXIN

Botulinum toxin or Botox is a poison produce by Clostridium Botulinum, a gram positive bacteria which produces 7 serotypes. When the toxin is ingested, it spreads to the peripheral cholinergic nerve ending where it blocks the release of acetylcholine resulting in a symmetric bilateral

descending neuromuscular illness. Incubation period is 18 to 36 hours. This toxin is heat labile and gets denatured by cooking.[4]

MECHANISM OF ACTION

On injecting small amount of botulinum toxin type A to an overactive muscle, it leads to decreased muscle activity as it inhibits the exocytosis of acetylcholine on motor nerve endings. It prevents the vesicle (where acetylcholine is stored) from binding to neurotransmitter membrane. The above effect is achieved by its endopeptidase activity. Thus, Botulinum toxin type A blocks the release of acetylcholine and weakens the muscle for about a period of 3 to 4 months.[5,6]

PREPARATION OF BOTOX:

Botox is prepared by the fermentation of clostridium botulinum. On fermentation clostridium liberates the toxin into the culture, which is then purified, harvested, crystallized with ammonium sulfate and then diluted with human serum albumin. It is then bottled in vials and sealed.[7]

About 100U of botox is present in each vial.

Human lethal dose of botox is 3000U.

Botox dose for cosmetic purpose is 100U

Vials should be stored below 5°C.

Each vial of botox contains:

- 1) 100U of clostridium botulinum type A
- 2) 0.5mg of NaCl in sterile dried form.

USES OF BOTOX:

- a) TMJ disorders:- It includes the diseases of TMJ and masticatory muscle dysfunction[8,9]. Conventionally it is treated with occlusal adjustments, surgery or with intra-oral appliances, which are invasive as well as expensive. Muscle relaxation with botox is a viable method replacing the conventional invasive methods. It helps to relax the muscle of mastication and thus the clenching reflex can be reduced[10,11].
- b) Bruxism:- Botox helps in relieving symptoms and pain of bruxism. Van Zandijcke and Marchau in their reports on use of botox for bruxism showed successful result of botulinum toxin A in treatment of patients

with severe bruxism. Dose of about 100U of botulinum toxin A was injected to the masseter and temporalis muscle[12].

- c) Gummy smile:- Gummy smile is an cosmetic issue. This may result due to over contraction of upper lip elevator muscle [levator labie superioris alaeque nasi]. Botox toxin can be injected carefully in small dose in order to limit the over contraction of these muscles. The effect of treatment may range from about three to six months and it should be repeated again after 6 months[13,14].
- d) Dentofacial aesthetics:- Botox injection to the nasolabial folds, lips, etc. can be given to provide immediate volume to the areas around mouth so as to enhance the smile line, lip line, etc. it can be used in lip deformity. It has to be injected at specific point. Dermal fillers are injected in interdental papilla so as to close the interdental space. The treatment is temporary, lasting for about 1 year[15].
- e) Dental implant and surgery:- Osseointegration of implant or healing of fracture through callus formation may get affected by the overloading of muscles of mastication. Botulinum toxin type A can be beneficial to allow implant osseointegration and fracture healing by relaxing the muscles[16,17].
- f) Masseteric hypertrophy:- Chronic jaw clenchers presents with hypertrophy of masseter[18,19]. Ultimately patients facial appearance gets altered and the jaw appears swollen. Conventional treatment include surgical resection. Recently in several clinical trials, it was seen that a small quantity of about 30U on each side injection of botox into masseter results in reduction of masseter hypertrophy[20,21].
- g) Mandibular spasm:- Due to mandibular spasm, mouth opening becomes limited. This occurs when the mandibular closing muscle remains in semicontracted state. This ultimately has its effect on oral hygiene, restriction to dental treatment, difficulty to eat, etc. this spastic state of muscle can be managed by injecting botox and thus reducing mandibular spasm[22,23].
- h) Trigeminal neuralgia:- It leads to severe pain. It is a neurological disorder affecting

orofacial muscles on unilateral side. Botox can be used as an adjunctive treatment in patients. It acts on nerve endings, reducing the severity of pain [24].

SIDE EFFECTS OF BOTOX THERAPY[25]

- a) Injection of botox may lead to temporary partial weakening of injected muscle.
- b) Soreness at injected site for few days.
- c) When used for long time, it may lead to injected muscle atrophy which is reversible.
- d) Other side effects include nausea, palpitation, flu-like syndrome, tingling sensation, etc which remains for 3 days.

CONTRAINDICATIONS [26, 27]

- a) In psychologically unstable person.
- b) Person who are dependent on facial movements and expressions for livelihood eg: actors.
- c) Patients suffering from neurons disorder.
- d) Infection at injected site.
- e) Patient with allergy to botulinum toxin A.
- f) Pregnant patients or lactating mothers.

CONCLUSION:

Botox is an emerging non invasive alternative to various oral surgical procedures. More study is required in this field to allow its routine use in dentistry for various oral problems. Controlled use of it is very important, and if used in right way, botox will definitely prove to be beneficial to dentist. Further research in this field is necessary.

Conflict of interest: None

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