Review Artcle

Dental Applications of Botox

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A B S T R A C T

There are few conditions where a complete treatment has not been yet confirmed in conventional manner. Botulinum toxin is used as an alternative therapy in many medical and dental conditions. This article describes in brief the applications of Botox especially in dentistry.

Keywords: Botox, gummy smile, bruxism, migrane.

INTRODUCTION

Botulinum toxin which commercially availiable is purified exotoxin of clostrodium botulinum an anaerobic bacteria. This neurotoxin is the cause of botulism-a serious paralytic illness, Botulinum toxins exists in seven types A to G but only type A and type B is availiable commercially.[1] Botulinum toxin type A is used in the treatment of blepharospasm,Severe primary axillary hyperhidrosis, cervical dystonia and in the temporary improvement in the appereance of wrinkles. Type B botulinum toxin is approved by Drug Administration (US) to be used in conical dystonic.Recently botulin toxin has been included in the treatment of orofacial conditions.

HISTORY

Justin Kerner (1786-1862) a German physician was the first person to give an idea of the therapeutic use of botulinum toxins. He coined the term "Sausage Poison" for this toxin. The term "botulism" was termed by another German physician John Muller in 1870.Burgen in 1949 was the first person to discover that this toxin has an ability to block neuromuscular transmission which was further proved by scottetal experimentally on monkeys. Type A stain of Botulinum was approved by US food and drug administration in 1989 and the trade name was given as Botox.[2]

MECHANISM OF ACTION

Botulinum toxin inhibits the release of acetylcholine at neuromuscular junction leading to the paralysis of muscles. The three steps in the action of botox are:[3,4]

1.After binding the toxin to the nerve it is internalized in the nerve.

2.The normal process of vesicle fusion to the plasma membrane is interfered by the degradation byproducts of the toxin which is cleaned by internal protcolytic enzymes.

3.This leads to the inhibition of exocytosis of acetylcholine and finally causing the neuromuscular blocking effect. The effect of the paralysis depends an dose administrated. Large doses cause complete paralysis while as partial activity results from therapeutic activity hence decreasing the appearance of hyper functional wrinkles.

APPLICATIONS OF BOTOX IN DENTISTRY

Botox is used in number of medical and dental conditions like headache,Migrane,gummy smile and angular chilitis, Dental implants and surgery, Bruxism and clenching cases.Myofacial pain and neck pain, temporomandibular disorders,depressed orthodontic appearance and orthodontic relapse, Massetric hypertrophy,Mandibular spasm, trigaminal neurologia finally for retention of removable prosthesis to reduce muscle hyperactivity.

MIGRANE

The recomended dosage for chronic migrane is 100 units/2ml or 200 units/4ml,with a final concentration of 5 units per 0.1 ml to be administrated intramuscularly.[5]

PATHOLOGICAL CLENCHING

Pathological clenching can have traumatic effect on gingiva, teeth and adjacent tissues. Limited doses of botulinum toxin type A reduces this disorder.The healing in the periodontal surgery can be improved if the clenching is reduced with the use of Botox bbefore and after surgery.[6]

MANDIBULAR SPASM

Spasm of the muscles of mastication can lead to the mandibular spasm. Mandibular spasm can effect the

maintainance of oral hygene and can lead to oral diseases. It can also effect the dental checkups and difficulty in eating. Botox therapy of muscles of mastication reduces the effect of spastic or hyper functional muscles.[7,8]

BRUXISM

The symptoms of bruxism is reduced markedly with the use of botulinum neurotoxin. A dosage of 200 U of botulinum toxins A was recommended by Ivanhoe et al[10] in a case of separate brain injurywith good results. Tan et al[11] did a long term study by injecting Botulinum toxin A in to the masseter muscle of patients having history ofsevere bruxism. These patients were refractory to medical and dental procedures. Results revealed a therapeutic response of 19 week duration.[9]

ENHANCEMENT OF FACIAL AESTHETICS

Knowing well the pathogenesis of the facial wrinkles Botox can be used in the treating the wrinkles. It is advised to use fillers in the lower face and the botox in the upper face.Botox is extremely effective in the lower face if the overlying skin is deformed due to rhytoid primarily caused by muscular action.

GUMMY SMILE

The excessive display of gingival tissue in maxilla while smiling is termed as Gummy smile Botox can be used as an alternative treatment in use of gummy smile, other treatment options are cosmetic surgical procedures, dermal fillers, orthodontic and orthognathic procedures and dental bleaching.[12]

SIDE EFFECTS OF BOTULINUM TOXINS AND SAFETY MEASURES

The side effects of Botulinum toxins are mild and transit, usually seen at the site of injection. These include nausea, headache,urticaria,dry mouth, dysphagia, dysphoria,transient muscle paralysis. As a safety measure the commercialyavailable butulinum toxin A should have a "Boxed warning "on its product including the adverse reaction as prescribed by both health Canada and FDA. The effect of the symptoms can range from one day to several weeks.[13]

DRUG INTERACTION

The following drugs are seen to change the effect of Botulinum toxin. Muscle relaxants, Aminoquinolenes,Linosamide, Magnesium Sulphate, Quinidine, D-Penicillamine, Cyclosporin, Aminoglycosides.[14]

CONTRAINDICATIONS

The patients with the following conditions should not be treated with Botulinum toxin. Or if treated extreme cautions should be taken.[15]

1. Patients with unrealistic expectations or psychologically unstable patients.
2. Patients with neuromuscular disorder.
3. Patients allergic to any component of BTX-A or BTX-B.
4. Actors, musicians, media personalities or singers who are more dependent on intact facial movements and expressions.
5. Pregnancy and lactation.

CONCLUSION

Botox has been introduced as an effective treatment option to many dental conditions where surgical treatment was required. But still it is not completely explored for dental use. Evolution of Botox has definitely improved the management of many dental conditions like myofacial pain particularly myogenous temporomandibular disorders etc.

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