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Review

Botulinum Toxin in the Treatment of Temporomandibular Disorders

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Abstract

There is a growing number of people who have some type of Temporomandibular Disorder (TMD), being called a set of disorders that include the muscles, the temporomandibular joint and other regions of the oroface. The main signs and symptoms of TMD are pain, tenderness to palpation and joint crackles. In view of this, Botulinum Toxin emerged as one of the ways to alleviate the pain caused by TMD, as it works by reducing muscle activity. The aim of this review was to report the pharmacological use of botulinum toxin in the therapy of temporomandibular disorders. The study was carried out through a literature review from February 2019 to November 2019, in which articles in Portuguese, Spanish and English were searched. They were searched in databases such as LILACS, GOOGLE ACADEMIC and PUBMED, with articles from 2010 to 2019. It was noted that botulinum toxin is an important ally in reducing pain and in the general treatment of temporomandibular disorders, but in agreement with the current literature further studies are needed.

Keywords: Botulinum Toxin type A, Ear-jaw articulation, Temporomandibular joint disorders

INTRODUCTION

Temporomandibular disorder or disorder (TMD) is defined as a group of disorders that include the temporomandibular joint (TMJ), masticatory muscles and related structures. Its etiology is associated with multifactorial, psychobehavioral, occlusal, neuromuscular factors, which involves stress, anxiety and depression. The main manifestations include pain, tenderness to palpation and joint sounds (Huamani et al., 2017).

TMD can be discovered through a well-performed anamnesis, with the recognition of predisposing aspects, by physical examination, with the touch of the musculature, with the measurement of active movement and evaluation of joint sounds. The purpose of treatment for TMD includes resuming masticatory activity, containing pain, teaching the patient and decreasing the divergent burdens that keep the problem. Conventional

treatment includes the use of myorelaxant plaques, instructions, rest, physiotherapy, use of medications and physical activities (Petrolli et al., 2018).

The most constant type of TMD is muscular, and myofascial pain is one of its subtypes that stands out for a local, chronic musculoskeletal pain, with its own signs and symptoms, such as the existence of myofascial trigger points (TP). Over-inflamed nodules located in a tight band of muscle, tendon or fascia, which when touched generate regional pain and pain in a distant area, are called PG. The manifestations caused by PG range from severe and disabling pain to reduced mobility and postural change (Antonia et al., 2013).

Botulinum toxin is generated by Clostridium botulinum bacteria that perform a paralyzing effect, preventing the activity of acetylcholine at the neuromuscular junction, promoting a relaxation in the hypertrophic musculature included. There are eight different types of botulinum toxin, but the one with the most use is type A (BTX-A), because of its potent effect. This toxin is more recognized in the harmonious treatments of wrinkles inthe facial region, but it has been used in dentistry as a drug in temporomandibular disorders, bruxism, gummy smile, pain and facial disharmonies. Dental surgeons are qualified to use this form of treatment safely, as they are competent and have the necessary knowledge of the head and neck area (Acosta et al., 2015).

The opposite effects of BTX-A include swelling, pain, erythema, ecchymosis, short-term decrease in sensitivity, all of these effects can happen after the application of this toxin. Headache, drooping eyelid, and perioral muscle paralysis may also occur. BTX-A is not indicated in cases of pregnancy, breastfeeding, neuromuscular junction disorders (myasthenia gravis, amyotrophic lateral sclerosis, myopathies), drug interactions (aminoglycosides, quinidine, calcium channel blockers, magnesium sulfate, succinylcholine and polymyxin) , Eaton-Lambert syndrome and in cases of allergic reactions to BTX-A (Gonçalves, 2013).

The aim of this study is to review the literature regarding botulinum toxin therapy in the treatment of temporomandibular disorders.

METHODOLOGY

The methodology selected for this work was through a literature review, which was approached about the effectiveness of botulinum toxin type A in the treatment of temporomandibular disorders. With the help of records, the study was carried out by bringing together articles in Portuguese, English and Spanish. In the search method on the subject, the online databases LILACS (Latin American and Caribbean Literature in Health Sciences), PUBMED and GOOGLE ACADEMIC were used.

For selection of articles, the following inclusion criteria were established: articles available in the databases that talked about the topic of botulinum toxin independently and in the treatment of temporomandibular disorders, alterations and temporomandibular joint. And as exclusion criteria: articles that did not talk about botulinum toxin independently and in the treatment of temporomandibular disorders, alterations and temporomandibular joint. The search time for articles involved the period between 2010-2019.

The descriptors controlled in health sciences (DeCS) were used: temporomandibular joint disorders, temporomandibular joint, botulinum toxin type A and its terms in English: Temporomandibular Joint Disorders, Temporamndibular Joint and Botulinum Toxins, Type A. After the search, 9 were found. articles in LILACS and used 4, 57 articles were found in PUBMED and used 11 and 210 articles were found in ACADEMIC GOOGLE and used 11.

RESULTS (REVIEW)

According to Patel et al. (2018), although the works to support the use of TXB in the therapy of myogenic TMD and bruxism are not wrong, there are certainly many works that prove the need for further studies in this field. There is a favorable amount of study that shows favorable results and efficiency levels. Thus, it is relevant to determine that botulinum toxin does not play a role in the underlying cause of TMD or bruxism, but only in potential effects (such as pain and bruxism). Traditional primary treatments need to be used before TXB is evaluated. But in the view of Machado et al. (2012), botulinum toxin in the therapy of people with bruxism and muscle hyperactivity shows little evidence and the works show restrictions, reducing the level of evidence conceived. The author believes that there needs to be more clinical studies monitored, randomized, double-blind, with protocol research methods for TMD, in order to analyze the authenticity of the efficiency of using TXB as an alternative therapy for myofascial chewing pain and temporomandibular changes in muscle.

Authors Kim et al. (2018) and Bogucki and Kownacka (2016) agree that botulinum toxin is a useful means and that it provides a better quality of life for the patient. Kim et al. (2018) reports that associating BTX-A applications with other types of pain therapies that do not correspond to traditional drugs and physical therapy may be clinically favorable. However, it is necessary to guide the patient in relation to the problems of this therapy, such as transient facial asymmetry, and this therapy is only done after obtaining the patient's permission. Bogucki and Kownacka (2016) state that in events of long-term TMJ changes, increased muscle activity and muscle tone spasms can occur due to malocclusion. TXB-A provides a chance for common social and family experience for many patients who were excluded because of pain. This drug is reliable when performed by a well-experienced

practitioner. Knowledge about this medicine is obtained through practical and theoretical courses.

Sposito and Teixeira (2014) share similar thoughts in relation to authors Kim et al. (2018) and Bogucki and Kownacka (2016), who report that botulinum toxin can act positively in reducing pain levels and pleasing the patient. The author discusses that TXB does not have relevant adverse consequences and that the muscles to be applied are the masseter and the anterior temporalis. According to the studies analyzed in your article, doses alternate from 30U to 50U for each side of the masseter and 20U to 35U for each side of the temporalis, in 3 locations for the masseter and 1 for the temporalis. The individual should be analyzed after 15 days of infiltration and should return to the office for evaluation after 3 to 4 months for another infiltration, if applicable. The author came to the conclusion that TXB-A helps improve conventional therapies so far, but more work is needed in this area yet.

Oliveira (2013) comes to a consensus with Awan et al, 2019 on the fact that botulinum toxin should be further tested and more rigorous studies should be carried out regarding its efficacy in temporomandibular disorders. Oliveira et al, 2013 comments that although the responses in TMD therapy for muscle hyperactivity with TXB-A are pleasant, there is still a need for more studies reinforced with long observation periods to indicate this treatment. Awan et al. (2019) reports that research shows a lack of agreement on the effect of TXB-A, believes that it is complicated to have a correct solution regarding TXB-A due to the decay of adequate and excellent studies. It highlights the need for longer and more elaborate studies.

In a study carried out by Pihut et al. (2016) with 42 male and female, aged between 19 and 48 years, evaluated with a painful condition in the masseter muscle related to temporomandibular joint disorders and tension-type headache. Patients received application within the muscle of 21 U (mouse units) of TXB-A in the masseter muscle. Pain potency was analyzed by visual scale (VAS) and verbal numbers (VNRS) in the period of 1 week before therapy and 24 weeks after therapy. The answer to this work was a reduction in referred pain, involving a reduction in temporal pain on both sides and a reduction in the consumption of analgesic drugs. The author concluded that botulinum toxin type A applications are an effective resource in therapy for masseter muscle pain in individuals with TMD and tension headache.

Pavanelli et al. (2018) addressed a specific clinical case of a 27-year-old patient, with a report of potent pain in the masseter and temporal area, with a pulsating characteristic, which was only contained with the use of pain medications. She was evaluated with chronic TMD using a clinical form and Diagnostic Criteria for Temporomandibular Disorders (DC/TMD), and a pain interrogation (Visual Analog Scales - VAS), central sensitivity and primary headaches to qualify and measure the pain related to TMD. The patient was analyzed through surface electromyography, measuring the strength of the molar mastication and in relation to the posture of the head and spine. Subsequently, the patient obtained TxB-A infiltration in the best PG for TMD containment and related signs. There was a return for a new evaluation 15,30 and 60 days after infiltration. During observation, there was a total disappearance of pain, a relevant decrease in the angle of the cervical curvature and decrease in molar bite force and muscle tone. In the case of this patient, TxB-A was effective in reducing pain caused by chronic TMD with muscle hypertrophy.

In the study by Calis (et al., 2019), 25 patients with muscle disorders of origin were selected from the 200 who enlisted for therapy. These chosen people obtained medication, pharmacological physiotherapy, treatment with myorelaxant plaques and botulinum toxin. Therapy followed a sequence. Botulinum toxin was infiltrated in accordance with electromyographic guidelines in nine people who did not respond well to other forms of therapy. The amount of bite power, pain and mouth opening was performed. Treatment with occlusal physiotherapy was performed in 16 patients, and in 9 patients TXA-B was very efficient. No side complications were reported at 6 months of observation. It was concluded that TXB-A does have a good effect on the treatment of TMD and can be used when conventional treatment does not resolve it.

Tüz et al. (2019) conducted a survey of 25 people with myofascial changes and pain. Maximum mouth opening (MMO), counted with a ruler, and pain were quantified with a 10 cm visual scale (VAS), patients were observed before therapy and after 6 months of therapy. Contentment with the therapy was acquired after six weeks of treatment. The mean contentment score six months after infiltration was 6.74/10, with considerable improvement in MMO and pain. Contentment was related to pain reduction. The application of TXB-A was very acceptable in the therapy of pain and masticatory myofascial changes in people with TMD. Evolutions were analyzed in MMO and pain, and most people were happy with the therapy.

Acosta et al. (2015) reported that hypertrophy of the masseter muscle is an unusual disorder of the facial region of anonymous etiology and pathogenesis that presents in young patients, generally causing aesthetic discomfort. In the clinical case, among so many treatments, the non-surgical method was preferred, using the infiltration of type A botulinum toxin, which was applied exactly to the muscle of the treated person. After a period of 15 days, a pleasant decrease in muscle hypertrophy and a significant evolution of the asymmetry of the face were analyzed. Fifty units of botulinum toxin type A were injected into the masseter muscle for facial muscle self-control and to restore esthetic regularity. The article showed an adequate and aesthetic effect for a

short time, which concludes that TXB-A is efficient in the therapy of facial asymmetries.

DISCUSSION AND CONCLUSION

This literature review has shown that botulinum toxin type A has a good capacity for use, being an important ally in the treatment of pain in myofascial dysfunction caused by temporomandibular joint disorders when first associated with conventional treatment.

Despite being a great form of treatment for TMD, there is still a need for more quality studies, adequate and with a longer follow-up of patients after application, as the long-term consequences of its use are still unknown. of TXA-A.

Conflict of Interest: The author declares no conflicts of interest.

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