



Effectiveness of botulinum toxin type A treatment of neck pain related to nocturnal bruxism: a case report

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Abstract

Objective: This case report describes a patient with nocturnal bruxism and related neck pain treated with botulinum toxin type A (BTX-A).

Clinical Features: The patient was a 27-year-old man with nocturnal bruxism and difficulty in active mouth opening and chewing and neck pain at rest. His numeric pain score was 7 of 10. Surface electromyography of the temporalis and masseter muscles showed typical signs of hyperactivity, characterized by compound muscle action potential amplitude alterations.

Intervention and Outcome: After clinical evaluation, he was treated with BTX-A to reduce masseter and temporalis muscle hyperactivity. After 3 days of treatment with BTX-A, with each masseter muscle injected with a dose of about 40 mouse units with a dilution of 1 mL and with temporal muscle bilaterally injected with 25 mouse units with the same dilution, a decrease in bruxism symptoms was reported. Neck pain also decreased after the first treatment (visual analog scale of 2/10) and then resolved completely. After 4 weeks, electromyography showed the reduction of muscle hyperactivity with a decrease in the amplitude of the motor action potential. The same reduction in signs and symptoms was still present at assessment 3 months posttreatment.

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Conclusion: These findings suggest that BTX-A may be a therapeutic option for the treatment of bruxism and related disorders.

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Introduction

In the last 20 years, botulinum toxin type A (BTX-A) has been used as a therapeutic instrument to treat a variety of conditions characterized by muscular and gland hyperfunction. Recent reports have indicated that BTX-A is safe and effective in the treatment of neuromuscular disorders such as focal, segmental dystonia (torticollis, oromandibular dystonia, laryngeal dystonia, writer's cramp); hemifacial spasm¹; and hypersecretory disorders such as hyperhidrosis and sialorrhea.²⁻⁴ Botulinum toxin type A injected into the skeletal muscle belly prevents the release of acetylcholine from the presynaptic axon of the motor endplate and blocks signal transmission at the neuromuscular junction. This process reduces muscle contraction, inducing a weakness condition.

Bruxism is a particular form of dystonia, a psychophysiologic disorder, and a common clinical issue in dentistry.⁵ *Bruxism*, defined as forcible clenching or grinding of the teeth, or a combination of both, has long been regarded as a disorder requiring treatment.⁶⁻⁸ *Bruxism* also been defined as (a) the parafunctional grinding of teeth and (b) an oral habit consisting of involuntary rhythmic or spasmodic nonfunctional gnashing, grinding, or clenching of the teeth, in other than chewing movements of the mandible, which may lead to occlusal trauma—also called *tooth grinding* or *occlusal neurosis*, according to the *Glossary of Prosthodontic Terms*.⁹ Bruxism is often classified as diurnal (occurring when the individual is awake) or nocturnal (occurring when the individual is sleeping).⁶ In addition, bruxism may be audible (when teeth are grinding) or inaudible (when teeth are clenched).⁵ For a more operational definition, the American Academy of Sleep Medicine defined *nocturnal bruxism* as a sleep-related movement disorder characterized by grinding or clenching of the teeth during sleep, usually associated with sleep arousal.¹⁰

Bruxism, as dystonia, is characterized by pain and exacerbated by fatigue, stress, and emotional extremes. Chronic bruxing often leads to abnormal wear on teeth, damaged bone and gum structures, oral or facial pain, headaches, tooth sensitivity, and potentially tooth loss.^{5,6} Although data are limited, bruxism appears to be more common in individuals

with developmental disabilities, specifically, profound/severe mental retardation, autism spectrum disorders, and Down syndrome.¹¹

In the general adult population, the prevalence based on the self-reporting of clenching of the teeth during waking hours is about 20%, whereas the prevalence of clenching during the sleeping hours is about 10% and that of grinding of the teeth during the sleeping hours ranges from 8% to 16%.¹²⁻¹⁵ Incidence of self-reported nocturnal bruxism in 4 large samples of college students increased from 5.1% to 22.5% over the period 1966-2002.¹⁶ Moreover, incidence appeared to be equally common in males and females but appears to occur more often in adults than in children.¹⁷ Traditionally, bruxism has been treated with mouth guards to prevent dental wear; but in several cases, mouth guards can increase the risk of wear of the temporomandibular joint and myofascial pain.⁶ Myofascial pain is described as a muscle hyperactivity involving facial pain related to temporomandibular disorders (TMDs), a craniofaciocervical dysfunction not completely understood.^{18,19} Usually, masseter and temporal muscle hyperactivity determines tension headaches and neck pain.^{20,21} Therefore, it was hypothesized that the temporal and masseter muscles could be involved into the pathogenesis of bruxism; so BTX-A can be used to decrease the hyperactivity of these muscles for reducing this condition.²²⁻²⁴

There are several reports in the literature, including a few randomized controlled studies (RCTs) and systematic reviews,^{11,25-27} of the favorable effect by botulinum toxin on craniofacial and neck pain as well as bruxism. However, the previous studies have not investigated the effect of botulinum toxin on neck pain caused by bruxism, only jaw pain due to bruxism or neck pain due to cervical dystonias.^{18-21,28} Because neck pain is commonly coexisting with craniofacial pain in TMD, this case report may be of interest. The following is a case report of a patient presenting with nocturnal bruxism with related neck pain and treated with BTX-A.

Case report

The patient in this case was a 27-year-old man with neck pain related to bruxism. Anamnesis was negative

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