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Review Article

A Systematic Literature Review of Therapeutic Potential of Botox in TMJ Disorders

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ABSTRACT

A significant percentage of the general population suffers from a wide range of conditions called temporomandibular joint (TMJ) disorders. Orofacial pain that intensifies with jaw movement is its defining feature. The diagnosis is strictly clinical. NSAIDs and self-care have played a major role in the treatment of this condition. Furthermore, since the condition is musculoskeletal in origin, botulinum injection has been suggested as a potential treatment option. Our goal was to examine the literature on the epidemiology, clinical presentation, diagnosis, and treatment of TMJ problems. In addition, we investigated recent research demonstrating the effectiveness of Botox injections in the treatment of this condition. The selection of publications was done using the PubMed database, and papers were acquired and examined. High morbidity is associated with TMD. Therefore, whenever clinicians encounter this condition, appropriate management is essential. The cornerstone of treatment for this condition has been self-care practices combined with NSAIDs for pain management. For chronic cases, Botox injections and muscle relaxants are other alternatives. However, most published studies on the effectiveness of Botox have produced conflicting results, as pain is subjective. More research is needed before Botox can be considered a first-line treatment.

Keywords: Botulinum injection, Temporomandibular joint, Temporomandibular joint disorders, Botox injection

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Introduction

A collection of musculoskeletal and neuromuscular illnesses that impact the TMJ and the surrounding muscles and bones are known as temporomandibular disorders (TMD), also referred to as temporomandibular joint (TMJ) syndrome [1–3]. The two most prevalent symptoms are joint discomfort and dysfunction [4]. These conditions can be divided into three groups: degenerative joint disease, internal derangement, and myofascial pain dysfunction syndrome [3, 5]. Botox injection has gained popularity recently as a treatment option for TMDs, especially myofascial pain dysfunction syndrome. As a result, our discussion will be limited to myofascial pain dysfunction syndrome and the role of Botox injections in its treatment.

Materials and Methods

To select articles, the PubMed database and the following keys "temporomandibular joint disorders"

OR "TMD" AND "Botox injection" OR "Botulinum Injection" were used in the search. In regards to the inclusion criteria, one of the following topics was considered for selecting the articles; temporomandibular joint disorders, myofascial pain, and Botox injection. All other articles that did not have one of these topics as their primary endpoint were the exclusion criteria.

Anatomy

The TMJ is a hinged joint articulating between the mandibular condyle and the glenoid fossa of the temporal bone [6, 7]. The muscles responsible for the movement of this joint are the muscles of mastication, including the masseter, temporalis, and pterygoid muscles [6]. Innervation of these muscles is provided by branches of the motor division of the trigeminal nerve [7].

Epidemiology

TMD are common presentations. Depending on the study, the prevalence ranges between 15-25% of adults, with a peak incidence at 20-40 years of age [3, 8]. Also, it reduces the quality of life and is associated with substantial morbidity. It has been estimated that in the US for every 100 million working adults, TMD contributes to 17.8 million lost workdays annually [9]. The etiology of TMD includes other pain conditions, such as chronic headaches; autoimmune disorders; psychiatric illnesses; and sleep apnea [8-11]. It might also be associated with repetitive jaw motions and some jaw positions. However, high-quality evidence is still lacking in linking these activities with TMD [12].

Classification

In 2013, the International Research Diagnostic Criteria for Temporomandibular Dysfunction Consortium Network published a classification system for TMD [13]. It can be categorized into intra-articular (within the joint) and extra-articular (involving the muscles surrounding the joint). By far, extra-articular conditions are the most common causes of TMD, accounting for at least 50% of cases [8, 9, 13].

Clinical manifestations

The most common symptom of TMD is acute or chronic pain [14]. The pain is classically described as dull, unilateral facial pain with changing intensity. The pain is aggravated by jaw motion, hence why most patients experience an "attack" after eating and may radiate to the posterior neck, the angle of the mandible, and the ear [8, 9]. The second most common symptom is otologic in nature, ranging from ear fullness to sharp stabbing pain in the ear. Ear pain can be a sign of internal derangement rather than of musculoskeletal origin [10]. Patients may also present with headaches, either unilateral or bilateral. Classically, the headache is worse in the morning [3].

Diagnosis

According to the diagnostic criteria published by the International Research Diagnostic Criteria for Temporomandibular Dysfunction Consortium Network, myofascial pain can be diagnosed based on a patient's history and physical examination [13]. As for history, the pain must be in the jaw, temple, ear, or front of it; and the pain is modified by jaw movement or function. Regarding physical examination, the pain must be confirmed to be within the temporalis or masseter muscles, the patient must report a familiar pain when palpating those muscles, and report that the pain is spreading beyond the site of palpation but is still confined within the boundaries of the muscles [13]. All these signs must be positive to diagnose myofascial pain. If the pain is spreading beyond the boundaries of the muscles, then it is termed myofascial pain with the referral [13].

Generally, there is no role for imaging in the diagnosis of TMD. However, if symptoms are severe or persist despite optimal medical management, a head CT can be obtained to rule out other pathologies and to visualize internal joint structures [3, 13].

Management

All patients with TMD must be educated and taught self-care measures, this includes optimal head posture, jaw exercises, and proper sleep hygiene [6]. However, the data on the efficacy of self-care measures are limited, but due to the lack of harm in these measures, they are generally suggested. As for pharmacological therapy, NSAIDs are the mainstay treatment for acute attacks of pain [15]. Nonetheless, NSAIDs are notorious for their gastrointestinal and renal side effects. Thus, patients must be educated not to rely on NSAIDs as a form of daily pain relief. Another option is skeletal muscle relaxants such as cyclobenzaprine and metaxalone. They are effective if taken as a scheduled dose rather than as needed [4, 6, 15]. For patients whose management failed to alleviate symptoms, Botulinum injection might be beneficial [16, 17].

Role of Botox in TMD

Despite years of clinical practice, there has not been a consensus on the beneficial role of Botox injection in the treatment of TMD. While patients may report short-

term relief after receiving Botox injections [14, 18], the data is still lacking regarding its efficacy. This effect can be explained by the fact that pain is a subjective symptom and cannot be standardized to assess the efficacy of Botox, leading to inconclusive study results [19]. Further studies are needed regarding the efficacy of Botox in the treatment of TMD before it can be used as first-line therapy [20].

Prognosis

TMD is usually a self-limiting condition in the general public. Furthermore, most patients respond well to NSAIDs and muscle relaxants. However, a small subtype of patients may go on to develop chronic TMD, for which Botox may offer temporary relief [15, 16, 21].

Conclusion

A high morbidity rate is linked to orofacial pain, which is a characteristic of TMJ diseases. The incidence of this ailment can reach 25%, and it affects a lot of individuals. Headache, ear pain, and ear fullness are possible additional symptoms. The primary diagnosis is clinical. An important aspect of managing this illness is taking care of oneself. Pain during high-intensity attacks may be lessened by pharmacological medication. The use of Botox to treat TMD is still unknown as of right now. The evidence presented by recent studies is conflicting, even if many patients may claim an improvement. Therefore, to demonstrate the advantageous effect of Botulinum infection, a high-quality RCT that accounts for the various forms of TMD is required.

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