

# Infiltration with triamcinolone in patients with temporomandibular disorders

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## Abstract

Temporomandibular Joint Disorders (TMD) are known to alter the quality of life of patients because of the high levels of pain. The objective of this research is to evaluate the effectiveness of infiltration with triamcinolone in patients with TMD and facial pain in a 1 month follow up. Materials and Methods: 40 patients (6 men and 34 women) with a history of over 18 years with orofacial pain TMD and who attended private practice, were selected for convenience according to the inclusion criteria and uncontrolled clinical trial exclusion needed for the research. The pain was measured by Visual Analog Scale (VAS) before treatment and at the end. Each patient received infiltration three times, at the site of pain, with 1 mg Kenacort® (triamcinolone) in 15-day interval. After 4 weeks post-treatment pain, adverse effects and satisfaction were evaluated. The initial pain intensity was 6,8. A month later it decreased to 1,8 (1,8, statistically significant P (0.00). Pain reduction was 78%.

**Keywords:** orofacial pain; infiltration with anti-inflammatory steroid; craniofacial disorder of joint or muscle origin

## Introduction

The temporo-mandibular joint (TMJ) is a point of connection between the mandible and the skull. Its function is vital for chewing, swallowing, and the mobility of the condyle relative to the skull. When a disorder occurs in function, the TMJ is limited, leading to pain, noises, dislocated mandible, difficulty chewing, inflammation and a muscle imbalance.<sup>1,2</sup>

TMD are very common. About 80% of the general population has at least one clinical sign of this dysfunction ranging between 20 and 40 years in both genders. The TMD 9:1 ratio affects women more frequently than men due to their estrogen production associated with other factors such as occlusion and parafunction, only 5% require some kind of surgical treatment.<sup>1</sup>

The injection of botulinum toxin is one of the therapies that has been implemented for the management of TMD, however, it is expensive and it is contraindicated in individuals who have hypersensitivity to any component.<sup>3,4</sup>

Triamcinolone is a potent anti-inflammatory steroid classified as synthetic glucocorticoid. It decreases tissue inflammation response by blocking phospholipase A2 in the cell membrane, causing disruption of the activity of Cyclo-oxygenase and Lipo-oxygenase. This action results in the vasodilation and reduction of vascular permeability. Triamcinolone is also a potent immune suppressant which reduces the proliferation of T lymphocytes, monocytes, eosinophils and decreases the binding of immunoglobulins with its receptors.<sup>5</sup>

Intra-articular corticosteroid injections in patients with osteoarthritis provide beneficial effects for significant pain relief and improved joint function, especially during inflammatory outbreaks.<sup>6</sup>

The most common local complications of intra-articular steroid injection include tears of tendons, soft tissue atrophy, skin atrophy and depigmentation and extravasation in the extra-articular space.<sup>6</sup>

Corticosteroid injections can cause temporary increases in pain, septic arthritis and deleterious effects on the intra-articular cartilage. Small doses of triamcinolone 10mg are more effective than high doses such as methylprednisolone 40 mg. The duration of effect of triamcinolone is substantially more durable than betamethasone. The effects of intra-articular corticosteroids are fast onset but may be relatively short, approximately one to three weeks, in contrast to the effect of hyaluronic acid which are similar onset, but more durable.<sup>7</sup> In orthopedics it is used as anti-inflammatory, as triamcinolone for intra-articular infiltration in order to lessen joint symptomatology. However, there are few records in the literature of their use to treat pain or dysfunction in the TMJ or surrounding muscles.<sup>3</sup>

The infiltration rate of TMJ muscle is an innovative therapy that could be an alternative to traditional treatment. However, there's not a lot of research done that shows the levels of effectiveness of this therapy, nor it is compared to other non-invasive treatments such as occlusal splints or oral drug treatments.<sup>3</sup> The aim of this study is to clinically assess the presence or absence of pain after treatment with infiltrating

triamcinolone in the masticatory muscles of the TMJ in TMD patients, identifying pain reduction and safety reported by patients.

## Materials and methods

### Materials

This is a non-randomized, uncontrolled clinical trial conducted in 40 patients aged 18 years old (34 women and 6 men) whose complaint was orofacial pain persisting for more than one month.

The study was approved by the ethics committee of the CES University. Patients signed a consent form based on the guidelines of the Declaration of Helsinki.

Patients were diagnosed according to the classification of the AAOP (American Academy of orofacial pain). This classification divides TMD in masticatory muscle or joint. Masticatory muscle disorders include: myofascial pain, myositis or trismus, myospasm contractor and neoplasia. Joint disorders include: developmental or acquired, inflammatory joint disorders, disc; immune, infectious, osteoarthritis, dislocation of the condyle; ankylosis or fractures.<sup>8-10</sup>

Patients with at least one of the following criteria were excluded: hypersensitivity to the components of triamcinolone, TMJ infections or surrounding structures, rheumatoid arthritis, asthma, or emphysema or pulmonary fibrosis, allergic disorders (hay fever, vasomotor rhinitis, angioneurotic edema), nephrotic syndrome or renal diseases, previous unsuccessful infiltrations, uncontrolled hypertension, patients taking anti-inflammatory medication, analgesics, muscle relaxants anxiolytics or at least in the last 7 days.<sup>11,12</sup>

Three injections of Kenacort® 1mg vial were given every 15 days at the site of pain. There was follow-up 30 days after the last infiltration. VA Spain, side effects and patient satisfaction were evaluated post-treatment.

### A. Evaluation of pre- treatment pain

Each patient was evaluated with a VAS questionnaire calibrated in a line ranking from 1 to 10. 0 being no orofacial pain and 10 being excruciating pain.

### B. Assessment of pain after treatment

After 1 month of finishing the treatment a VAS questionnaire was applied the same way as the pre-treatment evaluation, information was recorded for analysis.

### C. Evaluation of adverse effects and satisfaction

The questionnaire used to assess the satisfaction of each patient post-treatment had 7 questions, 3 with answers expected to rank from very good, good, fair to poor. The other 4 questions had answers ranking from always, almost always, rarely to never. There was the option to leave comments on adverse effects.

### D. Statistical Analysis

SPSS version 8.0 (SPSS Inc., Chicago, IL) was used for statistical analysis in order to describe the painful symptoms before treatment and the level of perception of the patient one month after the last infiltration. Descriptive statistics were used by absolute and relative frequencies and were expressed in percentages to describe and assess the level of pain before and after treatment with their respective average standard deviation plus the Wilcoxon test for comparison of mean pain level on the VAS scale. A significance level of 5% was assumed.

## Results

The study was conducted in 40 patients, 85 % female, 15% males. The average age was 45.6, with a range of 18 to 78 years of age. 95% of patients assessed had pain in the head, face or neck spontaneously or by touching. 80% had pain when chewing, talking or eating, 40% experienced daily headache. 77.5% had previously visited the dentist to manage pain. 45% (18 patients) used plate treatments, physiotherapy, soft diet, painkillers, or alternative medicine with an effectiveness of 22% (Figure 1).

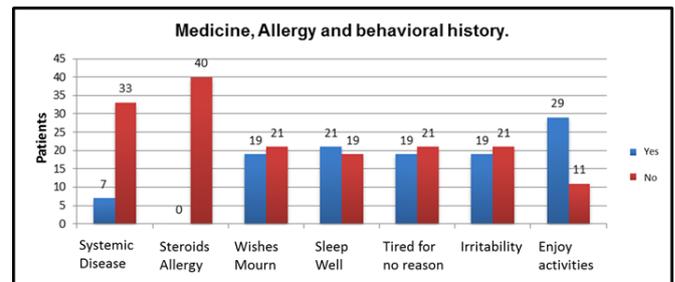


Figure 1 Assessment of pain symptoms and prior treatment received.

17.5% of patients had a controlled systemic disease like hypertension, diabetes, dyslipidemia, hypo or hyperthyroidism, none reported being allergic to steroids. 47.5% of the patients had periods of spontaneous crying, disruptive sleep patterns, fatigue and irritability for no apparent reason. There was an emotional and / or psychological inconsistency caused by the lack of excitement for daily activities (Figure 2).

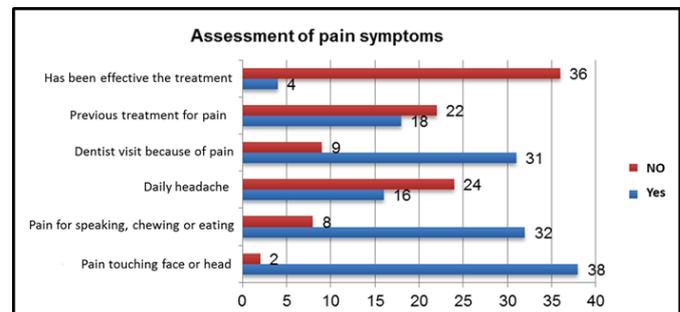


Figure 2 Medicine, Allergy and Behavioral History.

The most common painful areas were the masseter muscle 47.5 %, and TMJ 30%, with prevalence in the left hand and pain episodes, occasionally or every day. Other points of pain were the sternocleidomastoid (5%) and temporalis muscle (7.5%).

At the beginning of the study, the average pain intensity according to the VAS questionnaire was 6.85±2. One month after the last injection, pain decreased to 1.85±1.8, plus the P value of 0.000 was statistically significant. The total decrease in pain was 78% (Figure 3). No report of adverse effects to the drug.

100% of the patients felt well informed about the treatment, infiltration and they all reported a high level of satisfaction at the end of treatment, to the point where they recommended injections of triamcinolone for other patients with TMD (Figure 4).

One female patient reported that her pain had worsened since the first infiltration and did not improve, the pain increased by 6.0 points on the VAS questionnaire, from 4 to 10. However, in the satisfaction survey she expressed to be satisfied with the treatment reaching her

expectations and recommending it to other patients. On the pre-treatment questionnaire, she stated that she had disruptive sleep

patterns, she felt tired for no apparent reason and she did not enjoy daily activities, suggesting a high emotional component.

#### Descriptive Statistic

	N	Media	Deviation	Minimum	Maximum	Percentiles		
						25	50 (media)	75
Pre - Pain	40	6,850	2,0229	2,0	10,0	5,625	7,500	8,000
Post- pain	40	1,600	1,3359	0,0	7,0	1,000	1,000	2,000

**Figure 3** Comparison of pre and post infiltrative pain treatment. Statistically significant differences of 5.25 on the pain scale before and after application of medication  $p$  value = 0.0000 for the Wilcoxon test.

Question	Always	Almost Always	Almost never	Never
Have you felt satisfied with triamcinolone injections as treatment for your pain or discomfort?	17,5%	82,5%	--	--
Would you recommend the treatment that has been done to other people with the same symptoms?	25%	75%	--	--
Finally the three injections that were performed meet their expectations and goals?	15%	82,5%	2,5%	2,5%

**Figure 4** Satisfaction after applying infiltration.

## Discussion

Patients with TMD have an increased muscle tension caused by the excessive demand of masticatory muscles. They also have an increased tendency of depression and anxiety.<sup>13</sup> These symptoms were seen in half of the patients used in the trial. However, it is known that 72.5% of patients, even with the presence of pain, enjoy their daily activities.

Pain and inflammation by various mechanical and physiological factors such as surgical trauma, endotoxin and inflammatory mediator release, are presently non-steroidal drugs (NSAIDs aspiroxicam, diclofenc, celecoxib), glucocorticoids, antibiotics and others.<sup>5</sup>

In the present study to compare pre-treatment pain with post-treatment pain VAS values showed significant improvement in patients with triamcinolone infiltrates, it decreased value of points in the VAS by 5.25. The pain reduction correlates with the findings of satisfaction expressed with infiltrations, 100% of the patients were satisfied and would recommend the treatment to other patients.

A study published by The Cochrane Collaboration in 2009, with a sample of 1973 patients divided into 28 groups, evaluated the efficacy of infiltrations in the knee joint with corticosteroids, hyaluronic acid and betamethasone to reduce pain, swelling and disability in patients with osteoarthritis. It was demonstrated that corticosteroids were superior for pain reduction compared with betamethasone, a visual analog scale-VAS at treatment completion, the effect of this therapy lasted four weeks after the last infiltration; the confidence interval was 95 %.<sup>7</sup>

KD. Park et al.<sup>6</sup> performed intra-articular injections with five milliliters of a mixed material, 1% Lidocaine (1 ml), 20 mg of triamcinolone (1 ml) and the non -ionic contrast media (3 ml). With radiographies follow-up in 120 knees with osteoarthritis, injecting into the intra-articular space of the knee through three different sites. They recommend intra-articular injection of corticosteroids for the

handling of acute monoarthritis and osteoarthritis with inflammation or swelling.

The endogenous nature of triamcinolone and its ability to act locally and protect tissues from damage, are the premises that are based therapeutic applications. The presence of triple therapy effect anti-inflammatory, anti-allergic and anti-pruritic allows use for treating chronic inflammatory processes as TMD.<sup>14</sup> The present study showed the effectiveness of triamcinolone in reducing pain of TMD.

Claudia A Pereda et al, Spain. Stated in a meta-analysis of randomized controlled trials, that botulinum toxin is more effective than saline solution or triamcinolone for the miofascial syndrome.<sup>15</sup> Her study showed a statistically significant difference in favor of botulinum toxin versus saline or methylprednisolone. The difference in effectiveness of botulinum toxin against methylprednisolone was greater when the control was saline. The conclusions stated that there was a significant need for methodologically rigorous studies that accounted for the actual effectiveness of botulinum toxin in myofascial syndrome, cross-comparison of botulinum toxin with local anesthetic, without post-injection physical therapy, to determine the actual efficacy of botulinum toxin.<sup>4,5,10,16-20</sup>

## Conclusions

This study allowed to assess pain in TMD before and after infiltration with triamcinolone. The initial average pain intensity was 6.85, a month later, it decreased to 1.85, being a statistically significant difference. Effectiveness of triamcinolone in the treatment of TMD pain is evident. Infiltration with triamcinolone was a treatment option for patients with TMD of muscular type, presenting safety and few side effects.

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