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ARTICLE

Injecction of trigger points in the temporal muscles of patients with miofascial syndrome

Infiltrações de pontos-gatilho na musculatura temporal em pacientes com fibromialgia e cefaleia

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ABSTRACT

Objective: The aim was to examine the effect of blocking trigger points in the temporal muscles of patients with masticatory myofascial pain syndrome, fibromyalgia and headache. **Method:** Seventy patients with one trigger point were randomly divided into 3 groups: injection with saline or anesthetic and non-injected (control). **Results:** Pain was reduced in 87.71% patients injected with saline and 100% injected with anesthetic. Similar results were obtained for headache frequency. With regard to headache intensity, the injection groups differed from the control group, but not between themselves. **Conclusion:** Treatment with injection at trigger points decreased facial pain and frequency and intensity of headache. Considering the injected substance there was no difference.

Keywords: headache, fibromyalgia, infiltration, trigger point, myofascial pain syndrome.

RESUMO

Objetivo: Comparar o efeito terapêutico do bloqueio de pontos-gatilho na musculatura temporal com soro fisiológico e anestésico em pacientes com síndrome da dor miofascial mastigatória, fibromialgia e cefaleia, entre sí e com controles não-infiltrados. **Método:** Setenta pacientes que apresentaram pelo menos um ponto-gatilho na musculatura temporal foram aleatoriamente divididas em 3 grupos: infiltração com soro fisiológico, infiltração com anestésico e controle (não-infiltradas). **Resultados:** Houve redução na intensidade de dor na face em 87,71% dos pacientes infiltrados com soro fisiológico e em 100% dos pacientes infiltrados com anestésico, mas não no grupo controle. Houve similaridade dos resultados considerando a frequência da cefaléia. Quanto à intensidade da cefaléia, tanto a infiltração com soro fisiológico, quanto com anestésico foram efetivos e sem diferença significativa entre sí, ao contrário do grupo controle. **Conclusões:** O tratamento com infiltração diminui a dor na face, bem com a frequência e a intensidade da cefaléia. Quando considerado a substância infiltrada não há diferenças no tratamento.

Palavras-chave: cefaléia, fibromialgia, ponto-gatilho, síndrome da dor miofascial.

Fibromyalgia (FM) is a non-articular rheumatic syndrome, characterized by chronic widespread pain with tender points on palpation of specific painful body sites, in the absence of other known organic disease. The classification criteria were described in 1990 by the American College of Rheumatology[1]. It is considered the second most common rheumatic disease, affecting mainly women. Many other diseases may be associated with FM, and most patients have other associated comorbidities[2,3,4,5]. Myofascial pain syndrome (MPS) is a common regional pain syndrome, considered to be the complaint of pain most present in medical practice. The painful symptoms are the result of hyperalgesia of small trigger points, which radiate pain to distant sites[6,7]. MPS can affect the orofacial region, and called masticatory myofascial pain syndrome (MMPS). In patients with FM, facial pain intensity is correlated with generalized muscle pain[8]. The occurrence of headaches in patients with FM is great, where their symptoms can be manifested by myofascial pain referral of trigger points[9,10,11,12,13]. Considering the temporal muscles trigger points pain with their respective radiation areas are represented in Figure 1. One way of treating MPS is the injection of anesthetic or saline at trigger points. Treatment is aimed at decreasing the intensity of facial pain, and may also decrease headache symptoms by modulating pain[12,13,14,15,16,17,18,19,20]. The

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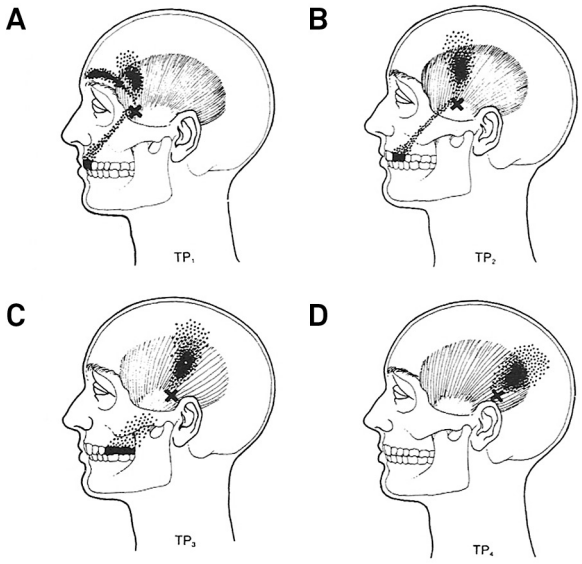

Figure 1. Dores Bucofaciais de Bell Tratamento Clínico da dor Bucofacial 6 edição Quintessence editora Ltda São Paulo 2006.

aims of the present study were to investigate the effectiveness of blocking trigger points using different substances (saline versus anesthetic) in the temporal muscles of patients with MMPS, FM and headache.

METHOD

This study was approved by the Ethics Committee for Human Research of the Hospital das Clinicas of the Federal University of Parana and consisted of a randomized, double-blind study with control group. The research was divided into two stages, illustrated in the flowchart presented (Figure 2), and in each, the patients read and signed an informed consent form. In the first stage of the study, we included patients with fibromyalgia, diagnosed according to the classification criteria of the American College of Rheumatology[1]; patients who were under treatment in the period between January 2007 and June 2008, in the fibromyalgia clinic of Hospital das Clinicas of the Federal University of Paraná. Exclusion criteria were: present for first visit and still not under treatment at the clinic, male patients, and inability to read and/or understand the informed consent form. The initial sample consisted of 100 female patients with fibromyalgia, aged 23-70 years. Patients initially attended the selection visit (first stage) and selected attended the visit of treatment, and the follow-up visit (second stage). In the first stage the patients were evaluated for the presence or no of pain in the region of the face and/or neck and headache without classify them.Next, they were examined for trigger points in the temporal muscle (right and left). The presence or absence of pain was scored using a numerical scale (0-no pain, 1-presence of sensitivity, 2-until the nail bed of the examiner's index finger turned whitish[8].

In the second stage, trigger points were injected with saline or anesthetic; the patients included here were those examined in the first stage of the study who had at least one trigger point in one of the temporal muscles (right or left) regardless of the palpation of these points cause or not a headache. Exclusion criteria were: evidence of inflammatory rheumatic disease, heart disease or uncontrolled hypertension, uncontrolled diabetes mellitus, blood dyscrasias, local infection, systemic infection, local skin changes and history of allergy to anti-inflammatory medication prescribed after injection[6]. Of the 100 patients examined in the first stage, 70 patients were included in this second stage (treatment with injection) and randomly divided into three groups (group with saline injection, group with anesthetic injection and control group). In the follow-up visit, the study subjects were re-evaluated for effectiveness of intervention used, which was compared to the status of the controls not subjected to therapeutic intervention.

Group 1 (control) consisted of 23 patients. Of these, 5 dropped out and 2 did not return for reassessment after 15 days, leaving 16 patients in this group. Group 2 (injection with saline 0.9%) 26 patients. Of these, 5 dropped out, 4 did not return for reassessment after 15 days, 2 were discarded due to the absence of a trigger point and 1 was ruled out due to being allergic to anti-inflammatory medication prescribed after the injection procedure, leaving 14 patients in this group. Group 3 (injection with anesthetic: 2% lidocaine without vasoconstrictor) consisted of 21 patients. Of these 3 dropped out and 1 did not return for reassessment after 15 days, leaving 17 patients in this group. The characteristics of the saline, anesthetic and control groups are shown in Figure 1, as well as information about the discontinued patients. In the saline and anesthetic groups, the procedure was performed in a double-blinded fashion and with the patient lying down. The trigger points were located using manual palpation of the skin disinfected with 70% alcohol, a freezing spray (-40°C) was applied to avoid pain during needle penetration[20,21]. In the procedure, we used a carpule syringe with a short 30G needle[6]. An amount of 0.2 to 0.5 ml of anesthetic or saline was injected at each trigger point[8,20]. The injection procedure, massage and stretching the temporal muscles after the procedure were performed as described by Simons et al. and other studies as well. Eight subjects of saline and anesthetic groups received nimesulide tablets 100 mg, to take twice a day for two days. While taking the medication, patients were instructed to apply warm, moist compresses three to four times a day for 10 to 15 minutes, or to soak the injection area in a warm bath[22].

Statistical analysis

The 70 patients included in the second stage were randomly divided by SigmaStat for Windows version 2.0 into three groups (group with saline injection, group with anesthetic injection and control group). The Wilcoxon test was used for

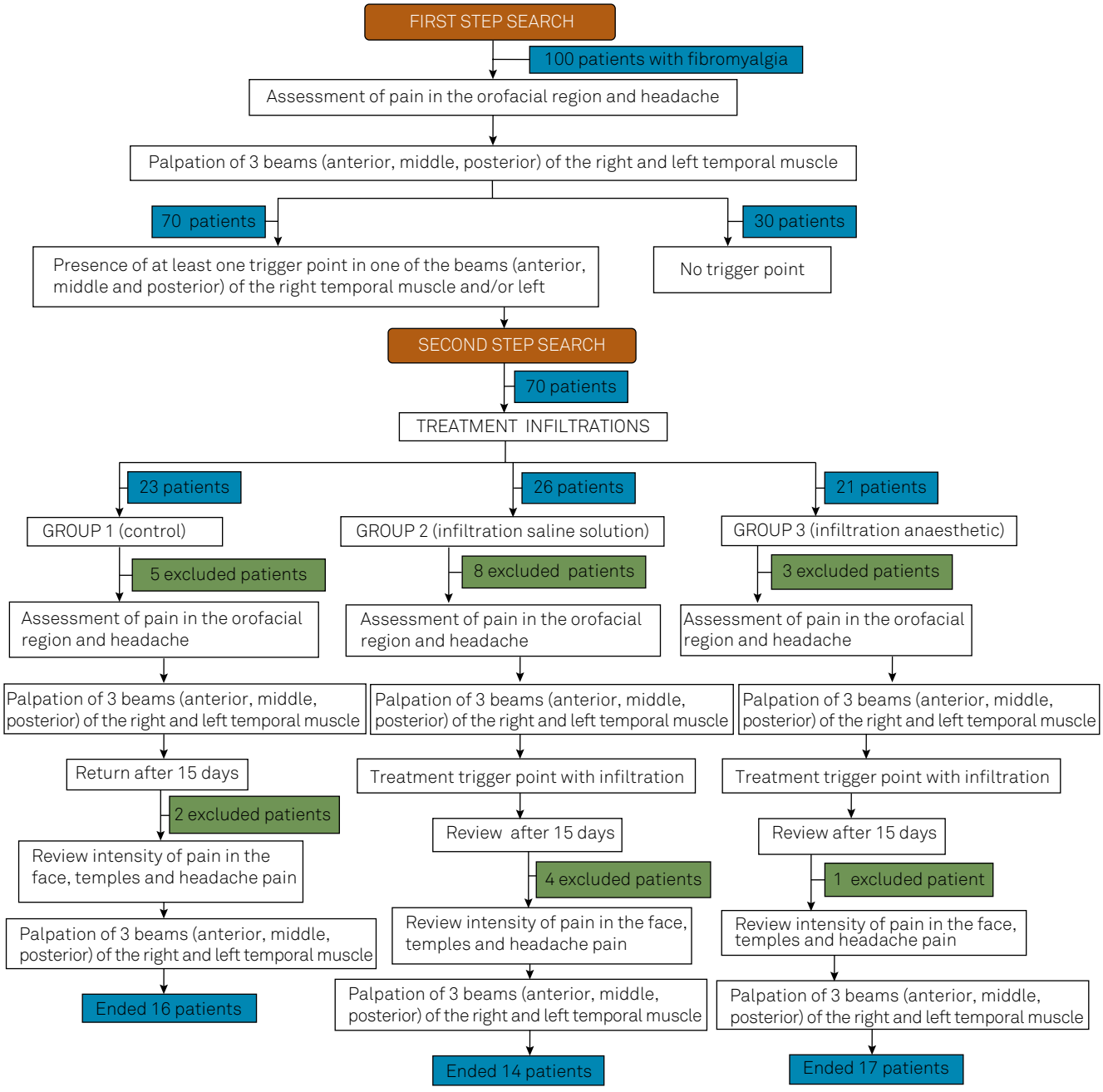

Figure 2. Flow chart of research stages.

comparison of intra-group results, and the Kruskal-Wallis test was used to compare the results between the groups. Two by two comparison of the groups in relation to the likelihood of improvement was carried out with logistic regression, controlling for patient age and adopting the Wald test, and if not possible, we used the Fisher exact test with Bonferroni. Correction values $p < 0.05$ indicate significance statistical.

RESULTS

In the first stage, all selected patients (100%) had some type of pain in the region of the face and/or neck as well as someone headache. Sensitivity in the temporal muscle occurred in 90% of patients. Despite that the patients had trigger points in all the temporal muscles, these points occurred less in the right posterior (27 patients) and left posterior (29 patients) and more in the left anterior (62 patients) and right anterior (61 patients). Headache was produced in 93 to 98% of trigger points when palpated (Table 1). The results below pertain to the records of the second stage, in which we analyzed the patients who were injected compared to the control group.

Facial pain intensity

Both saline and anesthetic treatments significantly reduced the intensity of facial pain, unlike the control group

(p = 0.004 and p < 0.001; Table 2). In a two by two comparison of the groups, there was a statistically significant difference when the comparison was carried out with the control group, but no difference between the groups treated with saline and anesthetic (p = 0.003 and p = 0.005; Table 3). In 85.71% of patients treated with saline, 100% treated with anesthetic and 43.75% of the control, there was reduction in facial pain intensity. In a two by two comparison of the groups in relation to reduction in facial pain intensity, a statistically significant difference was found when the comparison was between the anesthetic-treated group and control group (p < 0.001; Table 3).

Pain in the temples or above the ears

Only two individuals in the saline group, two in the control group and five in the anesthetic group said that they did not feel pain in the temples or above the ears 15 days after treatment. The improvement occurred in 14.29% of those treated with saline, in 29.41% of those treated with anesthetic and 12.50% in the control group. Two by two comparison of the groups showed no statistically significant difference (Table 3).

Weekly headache frequency

Regarding the weekly headache frequency, unlike the control group, both the saline and anesthetic groups showed decreased frequency, demonstrated by statistically significant differences (p = 0.037 and p = 0.002; Table 2). Two by two comparison of the groups showed a statistically significant difference when the comparison was carried out with the control group, but no difference between the groups treated with saline and anesthetic (p = 0.003 and p = 0.002; Table 3).

Headache intensity

Regarding headache intensity, both saline and anesthetic treatments were effective, differing from the control group (p = 0.008 and p = 0.001; Table 2). Headache intensity decreased in patients treated with saline by 64.29% and with

Table 1. Result of palpation of each temporal muscle.

Musc. Temp.	Pain on muscle palpation					Presence of trigger points			Palpation causes headache		
	0	1	2	3	n	No	Yes	n	No	Yes	n
post. lt.	11 (11%)	40 (40%)	44 (44%)	5 (5%)	100	71 (71%)	29 (29%)	100	2 (7%)	27 (93%)	29
med.lt.	5 (5%)	28 (28%)	56 (56%)	11 (11%)	100	52 (52%)	48 (48%)	100	3 (6%)	45 (94%)	48
ant. lt.	2 (2%)	13 (13%)	60 (60%)	25 (25%)	100	38 (38%)	62 (62%)	100	1 (2%)	61 (98%)	62
post. rt.	26 (26%)	43 (43%)	29 (29%)	2 (2%)	100	73 (73%)	27 (27%)	100	2 (7%)	25 (93%)	27
med.rt.	12 (12%)	32 (32%)	51 (51%)	5 (5%)	100	58 (58%)	42 (42%)	100	2 (5%)	40 (95%)	42
ant. rt.	3 (3%)	21 (21%)	49 (49%)	27 (27%)	100	39 (39%)	61 (61%)	100	2 (3%)	59 (97%)	61

musc. temp.: temporal muscle; post. lt.: left posterior; ant. lt.: left anterior; post. rt.: right posterior; med. rt.: right median; ant. rt.: right anterior; n: total patients; 0: absence of pain; 1: presence of sensitivity; 2: presence of pain; 3: escape response.

Table 2. Comparison between groups.

Group		n	Intensity of facial pain	p*	Weekly frequency of headache	p*	Intensity of headache	p*
Saline	Pre-injection	14	7.8 ± 1.6		4.3 ± 2.4		8.6 ± 1.8	
	Post-15 days	14	2.8 ± 3.7	0.004	2.1 ± 2.7	0.037	5.1 ± 4.0	0.008
	Decrease	14	5.0 ± 4.0		2.1 ± 3.3		3.5 ± 3.8	
Anesthetic	Pre-injection	17	6.5 ± 1.8		4.1 ± 1.9		7.8 ± 1.6	
	Post-15 days	17	1.6 ± 2.1	< 0.001	1.9 ± 1.7	0.002	4.4 ± 2.5	0.001
	Decrease	17	4.9 ± 1.9		2.2 ± 2.2		3.4 ± 2.8	
Control	Pre-injection	16	7.0 ± 1.8		2.9 ± 2.5		7.9 ± 2.4	
	Post-15 days	16	5.8 ± 4.1	0.209	3.1 ± 2.3	0.919	6.6 ± 2.5	0.173
	Decrease	16	1.3 ± 3.6		-0.1 ± 1.5		1.3± 3.2	

(*) non-parametric wilcoxon test; p < 0.05.

Table 3. Two by two comparison of groups.

Groups compared	Intensity of facial pain p*	Decrease in intensity of facial pain p**	Pain in temples or above ears p***	Weekly frequency of headache p*	Intensity of headache p***
Saline x Anesthetic	0.704	0.196	0.384	0.966	0.220
Saline x Control	0.003	0.026	0.801	0.003	0.756
Anesthetic x Control	0.005	< 0.001	0.204	0.002	0.112

(*) Mann-whitney test, p < 0.05; (**) Fisher exact test, bonferroni correction, p < 0.017; (***) Wald test, logistic regression, p < 0.05.

anesthetic by 82.35%, compared to 56.25% in the control group. In a two by two comparison of the groups, no statistically significant difference was found (Table 3).

DISCUSSION

The study involved a sample of only female patients, because FM is a chronic pain syndrome that affects mainly women[2,3,4]. There was agreement with the age group in which is the disease occurs, 20 to 60 years[17]. The mean age was close to that of most recent studies demonstrating that the prevalence in women peaks around 55 to 64 years, ages similar to that of menopause, in which there is a significant hormonal decline, reinforcing the possible influence of hormonal factors[2].

It is believed that the high percentage (100%) of patients with pain in some region of the face and/or neck occurred because of this study being specifically for the assessment of pain in this region; pain in this region is often not observed due to the lack of emphasis given by the examiner, mainly when the pain is not just a localized problem but rather a condition with generalized muscle pain like FM[10]. In these patients, sensitivity in the temporal muscle was identified by the reporting of pain at the temples or above the ears, confirming a high pain sensitivity in the temporal muscle of patients with MPS[7]. The strong presence of MMPS as well as headache confirmed the association of FM with other conditions. The high prevalence of both in this study reinforced the need for individual evaluation of each patient, to identify the comorbidity, influencing the measurement of symptoms and assisting in the treatment modality and thereby controlling the disease[11,12].

Our percentage of 100% of patients with headache was higher than that reported by some authors, i.e., 53 to 82%, but in agreement with others observing more than 91%[10,11]. We found at least one trigger point in the temporal muscle in 70% of patients palpated in the first stage of the study, confirming the association with MPS, higher than other reports of 18%[1,13]. In agreement with others noting 68 to 72%[14,15]. The high percentage of patients found with MMPS confirms the association of temporomandibular disorders in patients with fibromyalgia, and reinforces the hypothesis of these disorders as a possible cause of the facial pain[9]. The irradiation of pain from these trigger points can cause headache and toothache[11,22].

Headache may be a manifestation of muscle sensitivity[9,16]. Pain irradiation from trigger points located in the temporal muscle can be manifested by headache[11,15,16,17,22]. This study did not aim to classify the headache, but when the treatment of myofascial pain (trigger points infiltration in the temporal muscle), there were changes both in intensity and in headache frequency. Thus, these patients was possible to state that there was a presence of a secondary headache myofascial syndrome. The presence of trigger points in these areas is consistent, because it is the most typical location of migraine pain. Also, it is among the most common areas of radiating pain in patients with migraine, including tension-type chronic headache[14,12,16].

Representing one of the forms of recommended treatment[13,17], injection of trigger points in the temporal muscle was used to test the effect of this type of treatment on myofascial pain and headache. Although there are reports that the injection procedure is required in only 20 to 25% of patients with MPS, it is considered most effective treatment[18,23]. The amount of anesthetic injected at each trigger point was about 0.2 ml to 0.5 ml of 2% lidocaine without vasoconstrictor[6,17]. Lidocaine was the anesthetic of choice, as in other studies. It is proven that this causes necrosis of the muscle tissue injected, but with rapid regeneration occurring in 16 days[6,16,17,18,19,24,25].

As part of the treatment, the muscles were stretched after the injection to enhance the effectiveness of treatment[6]. To minimize soreness after injection, in addition to hemostasis care, anti-inflammatory medication was used for 48 hours together with warm, moist compresses, despite that there have been studies without stretching and heat treatment after injection[20]. In the control group, anti-inflammatory medication was not used, because the patients were already receiving treatment in the fibromyalgia clinic and had been undergoing medical treatment without results for alleviation of pain.

These patients were continued use of medications. Since the purpose of administering an anti-inflammatory medication was only to relieve soreness after the infiltration procedure, whether or anesthetic physiological serum, non-medicated control group. In addition, medication use was restricted for only two days and believe it has not interfered in the evaluation that took place 15 days after the first visit for all groups. Failure to use warm, moist compresses in the control group may have influenced the results obtained.

In this study, both local anesthetic and saline were effective in the treatment of trigger points[21]. Both groups showed a reduction in pain intensity compared with control, with no statistically significant difference between them. The control group also showed improvement, but this was not statistically significant. However, there are studies showing greater efficacy of anesthesia and without injection treatments, and there are different comparisons with regard to the type of substance injected, also testing dry needling[13,18,22,24,25]. But there is agreement that the effectiveness of the treatment is not related to the nature of the substance injected. Probably the relief occurs by needle contact with the trigger point, breaking its vicious cycle[16,24]. After treatment, there was a decrease in pain in all the temporal muscles examined, a finding confirmed by palpation. When asking about pain at the temples or above the ears, the patients said that there was no improvement. We suggest that this negative finding could be related to treatment failure in points of this distribution, depressive symptoms, cognitive and memory alterations, often present in patients with FM, hindering the account of pain[6,21,26].

The present study demonstrated that anesthetic and saline injection, compared to the control group, caused a reduction in both the intensity and frequency of headache, with no statistically significant difference between the two injection groups. The study reinforced the evidence that treatments aimed at muscles decrease headache symptoms, through a central mechanism of pain modulation[12,14,15,16,17,18,19,20].

Our study adds to other evidence that FM patients experience pain in the orofacial region and trigger points in the temporal muscles correlated with headache. Although there is no other study addressing the injection of trigger points in the temporal muscles of FM patients, as a form of treatment, we suggest its utilization, be it with saline or anesthetic, with the aim of abolishing or minimizing orofacial pain and headache in these patients.

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