



Correlation between pressure pain threshold and pain intensity in patients with temporomandibular disorders who are compliant or non-compliant with conservative treatment

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Objective. To investigate the correlation between pain measurements performed using a visual analogue scale (VAS) and pressure pain threshold (PPT) in individuals with temporomandibular disorders who underwent conservative treatment.

Study Design. This prospective study assessed 78 individuals diagnosed with myofascial pain, and the treatment consisted of counseling and self-care therapy sessions. Pain was assessed by means of a VAS and PPT at baseline (T0), after 15 to 30 days (T1), and after 75 to 90 days (T2). The participants were divided into two groups: "Compliant Group" and "Non-Compliant Group." The data were analyzed by means of Spearman's correlation test and Friedman's analysis of variance by ranks.

Results. Correlations were not identified between the VAS and PPT values at time points—T0, T1, or T2—in any group.

Conclusion. Although, VAS and PPT represent subjective features, such as the perception of pain, the hypothesis that high pain intensity levels are equivalent to high pain sensitivity levels was not demonstrated. (Oral Surg Oral Med Oral Pathol Oral Radiol 2015;120:459-468)

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.¹ As a function of its multidimensional nature, including the four dimensions *sensory discriminative*, *affective motivational*, *cognitive evaluative*, and *psychosocial*, pain manifests differently in different individuals.²

The term temporomandibular disorder (TMD) encompasses a wide number of clinical problems affecting the masticatory muscles, the temporomandibular joint (TMJ), and the associated structures. The most common signs and symptoms of TMD include pain in the masticatory muscles, the TMJ, or both; irregular or limited mandibular function; sensitivity to palpation; and joint noises.^{3,4}

Because it is considered a multifactorial disease, the etiology of TMD is uncertain, and risks from invasive and irreversible treatments are considerable. Compelling evidence has been reported that most TMDs are either self-limiting or simply managed, and several studies have illustrated the benign evolution of TMD and recommended conservative treatment approaches.⁵⁻¹³ Therapeutic modalities include cognitive behavioral

therapy,¹⁴⁻¹⁶ intraoral appliances,¹⁷⁻¹⁹ and therapeutic exercises.^{10,20,21} Low-cost therapeutic modalities based on counseling²²⁻²⁴ and self-care are beneficial and contribute to controlling the signs and symptoms by improving the psychological domains and eliminating deleterious behaviors.^{19,22,23,25,26}

One of the methods used to assess the effectiveness of any treatment for muscular TMD is to measure the pain that remains after treatment, and such measurements are usually performed according to the visual analogue scale (VAS) or the verbal numeric scale.²⁷ However, these measurements are unidimensional—that is, they only assess intensity.²⁸ Additional quantitative measurements might be obtained using a pressure algometer, which is an instrument that measures the pressure pain threshold (PPT) exhibited by an individual when pressure is applied to a painful area.^{29,30} Several studies have shown that algometry has wide applicability in clinical practice and research for diagnostic purposes^{31,32} or as a treatment assessment tool.^{29,33,34} Algometry can detect trigger points and fibromyalgia; measure the activity of arthritis; establish the efficacy of, and response to, pharmacologic interventions, physical therapy, injection, and manipulation;³⁵⁻³⁹ and investigate certain types of headaches.⁴⁰⁻⁴²

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Statement of Clinical Relevance

Measurements of pain intensity and pain sensitivity are not correlated in individuals with temporomandibular disorders who have undergone conservative treatment.

Well-defined and reliable criteria to establish the PPT of masticatory muscles are available in the literature.^{33,43-45}

However, previous investigations have not correlated pain intensity and mechanical masticatory muscle sensitivity over the course of conservative treatments for muscular TMD.

Our hypothesis is that there is no correlation between PPT and VAS, although they ostensibly measure the same experience—pain. Based on the conditions described above, the aims of this study were to investigate the correlation between pain intensity, as measured by the VAS, and pain sensitivity, as expressed by the PPT, in individuals with TMD who are compliant or non-compliant with conservative treatment and assess the effectiveness of treatments according to the patients' compliance.

METHODS

Study sample

This prospective observational study assessed and followed up 96 volunteers with muscular TMD who were treated with conservative approaches at the Temporomandibular Disorders and Orofacial Pain Outpatient Clinic at the Escola Paulista de Medicina of the Universidade Federal de São Paulo/Hospital São Paulo (Amb. DTM & DOF – EPM-UNIFESP/HSP) from August to December 2013. One single examiner with vast experience in this field performed the patient examinations. The inclusion criteria consisted of the diagnosis of myofascial pain with or without limited opening, which was based on the *Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD)*,⁴⁶ age over 18 years, and pain in the masseter and temporalis muscles area and/or in the lateral pole of the condyle area (unilaterally or bilaterally) for at least 6 months. In addition, we noted if the masseter and temporalis muscles showed referred pain during palpation performed to elicit pain according to the *RDC/TMD*. To verify the presence of neck pain, we palpated the sternocleidomastoid, suboccipital, and trapezius muscle areas. If the patients had pain in another area of the body in addition to the main complaint, they were asked to fill in a schematic drawing of the face and entire body to indicate the site of this pain. We verbally investigated the occurrence of deleterious habits by querying the patient about parafunctions.

Participation was voluntary, and all of the participants were given information on the study procedures and signed an informed consent form. The study was approved by the Comitê de Ética em Pesquisa – CEP of UNIFESP/HSP and awarded a certificate of presentation for ethical appraisal (C.A.A.E.) no. 07228612.3.0000.5505.

Conservative treatment

The evaluation of the treatment program consisted of three time points: baseline (T0), 15 to 30 days after baseline (T1), and end of treatment 75-90 days after baseline (T2).

In session one (T0), after applying the *RDC/TMD* criteria, the first part of treatment, referred to as *counseling*, was performed. Counseling consisted of explaining the disease characteristics and describing deleterious habits that could contribute to the persistence of pain and should be avoided. The investigated habits included clenching the jaws, grinding teeth, maintaining teeth in constant occlusion,^{9,23,47} biting the nails, and supporting the head with a hand. Relative to habit reversal techniques,^{22,24} each participant received a sheet with self-adhesive labels and was instructed to place one on a visible surface as a reminder to not perform the deleterious habit.

The second part of treatment consisted of self-care, which is defined as a process during which a layperson personally performs actions to promote health, prevent disease, and detect and treat disease when it occurs.^{21,25,48,49} The participants were given two thermal gel packs and instructed to warm them and apply them wrapped in a piece of cloth over the painful areas for 20 minutes once a day. Subsequently, their instructions included performing isotonic active therapeutic exercises involving the slow opening and closing of the mouth 10 times. Such exercises favor the elongation, relaxation, and coordination of the masticatory muscles and are prescribed as an initial therapeutic option to patients with pain.⁵⁰ The warm applications were indicated to increase the local blood flow and viscoelasticity of the extracellular matrix of the muscle fibers, thus promoting reduction of pain and facilitating the performance of therapeutic exercises.

The participants were divided into two groups: those who showed high compliance to treatment, the “compliant group” (CG), and those who did not comply with the treatment, or the “non-compliant group” (NCG). The NCG included participants who did not perform the prescribed self-care therapy, regardless of intent, for more than two-thirds of the time between the first and second visits and between the second and third visits; thus, they performed the prescribed therapy less than 5 days out of the prescribed 15 days. This assessment was performed by asking participants if they performed the self-care therapy daily and how many times they performed the therapy.

The participants who did not report an improvement of pain over the course of treatment continued their treatment at Amb. DTM & DOF – EPM-UNIFESP/HSP.

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