Myofascial Trigger Points, Pain, Disability, and Sleep Quality in Individuals With Mechanical Neck Pain

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Abstract

Objective: The purpose of this study was to investigate the presence of active myofascial trigger points (MTrPs) in a greater number of muscles than previous studies and the relation between the presence of MTrPs, the intensity of pain, disability, and sleep quality in mechanical neck pain.

Methods: Fifteen patients with mechanical neck pain (80% women) and 12 comparable controls participated. Myofascial trigger points were bilaterally explored in the upper trapezius, splenius capitis, semispinalis capitis, sternocleidomastoid, levator scapulae, and scalene muscles in a blinded design. Myofascial trigger points were considered active if the subject recognized the elicited referred pain as a familiar symptom. Myofascial trigger points were considered latent if the elicited referred pain was not recognized as a symptom. Pain was collected with a numerical pain rate scale (0-10); disability was assessed with Neck Disability Index; and sleep quality, with the Pittsburgh Sleep Quality Index.

Results: Patients exhibited a greater disability and worse sleep quality than controls ($P < .001$). The Pittsburgh Sleep Quality Index score was associated with the worst intensity of pain ($r = 0.589$; $P = .021$) and disability ($r = 0.552$; $P = .033$). Patients showed a greater ($P = .002$) number of active MTrPs (mean, 2 ± 2) and similar number ($P = .505$) of latent MTrPs (1.6 ± 1.4) than controls (latent MTrPs, 1.3 ± 1.4). No significant association between the number of latent or active MTrPs and pain, disability, or sleep quality was found.

Conclusions: The referred pain elicited by active MTrPs in the neck and shoulder muscles contributed to symptoms in mechanical neck pain. Patients exhibited higher disability and worse sleep quality than controls. Sleep quality was associated with pain intensity and disability. No association between active MTrPs and the intensity of pain, disability, or sleep quality was found. (J Manipulative Physiol Ther 2012;35:608-613)

Key Indexing Terms: *Neck Pain; Trigger Points; Myofascial Pain Syndromes; Disability; Sleep*

Neck pain can have an insidious (mechanical) or traumatic (whiplash-associated neck pain) onset. *Mechanical neck pain* is defined as pain in the cervical spine and/or shoulder area with symptoms provoked by neck postures, neck movement, or palpation of the cervical muscles. Neck pain constitutes a significant health care problem affecting 45% to 54% of the general population.[1] A systematic review reported 1-year prevalence for neck pain ranging from 16.7% to 75.1% (mean, 37.2%).[2] In addition, the economic burden associated with the management of neck pain is second only to low back pain in annual workers' compensation costs in the United States.[3]

It has been proposed that myofascial trigger points (MTrPs) can be involved in pain processes in patients with mechanical neck pain; however, few studies had included MTrPs therapy for the management of these patients.[4,5] Simons et al[6] define an MTrP as a hyperirritable spot in a taut band of a skeletal muscle that is painful on contraction, stretching, or stimulation and elicits a referred pain distant from the point. Myofascial trigger points can be clinically classified as active or latent. Active MTrPs are those causing spontaneous pain symptoms, which elicited

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referred pain reproduces the patient's symptoms and is recognized as a familiar phenomenon for the patient. Latent MTrPs are those not responsible of symptoms of the patient. Clinical distinction between active and latent MTrPs has been substantiated by histochemical findings because higher levels of some algogenic substances and chemical mediators (ie, bradykinin, serotonin, or substance P) have been found in active MTrPs as compared with latent MTrPs and non-MTrPs.[7] The presence of algogenic substances and chemical mediators within active MTrPs may be involved in sensitization processes found in patients with mechanical neck pain.[8]

Fernández-de-las-Peñas et al[9] found that the referred pain elicited by MTrPs in the upper trapezius, levator scapulae, and sternocleidomastoid muscles reproduced the symptoms in patients with mechanical neck pain. However, this study only included the exploration of these muscles and did not assess other outcomes such as disability or sleep quality. In addition, there is some evidence demonstrating that treatment of active MTrPs is effective for reducing symptoms in patients with mechanical neck pain.[10-12] These studies suggest that MTrPs can be involved in the genesis of mechanical neck pain.

In addition to muscle impairments, sleep disturbances are considered an essential element in patients with chronic pain.[13-16] It has been proposed that addressing the ongoing cycle of pain and sleep disturbances is essential for treatment for patients with mechanical neck pain. We do not know if the presence of active MTrPs is related to functional impairments such as sleep quality or disability in this population. Therefore, the aims of this study were (1) to investigate the presence of active MTrPs in a greater number of muscles in individuals with mechanical neck pain and (2) to determine the relationship between the presence of active MTrPs, the intensity of pain, disability, and sleep quality in individuals with mechanical neck pain.

Methods

Participants

In this study, patients with mechanical neck pain recruited from a private clinic of physical therapy were recruited. To be included, patients should have pain in the cervical spine and/or shoulder area with symptoms provoked by neck postures, neck movement, or palpation of the cervical musculature. No pain in the upper extremity was permitted. Exclusion criteria included (1) previous whiplash injury, (2) cervical surgery, (3) diagnosis of cervical radiculopathy or myelopathy, (4) diagnosis of fibromyalgia, (5) younger than 18 or older than 65 years, or (6) if they had received any therapeutic intervention in the past 3 months before the study.

The medical history from each patient was solicited from their primary care physician to assess the presence of exclusion criteria. In addition, healthy subjects without history of neck or shoulder pain the previous year, neck surgery or fracture, or neurologic disorders who responded to a local advertisement were also included. The control group was searched for comparable subjects in terms of age and sex. The protocol was approved by the local human research committee (Universidad de Salamanca) and conducted following the Declaration of Helsinki. All participants signed the informed consent before their inclusion in the study.

Demographic and Clinical Data

Demographic data including age, sex, weight, height, body mass index, medical history, and location and nature of the symptoms were collected. An 11-point numerical pain rate scale (0, no pain; 10, maximum pain) was used to assess current intensity of pain, worst and lowest intensity of pain experienced in the preceding week.[17] Patients also completed the Neck Disability Index (NDI) to measure their self-reported disability. The NDI consist of 10 questions measured on a 6-point scale (0, no disability; 5, full disability).[18] The numeric score for each item is summed for a score ranging from 0 to 50, where higher score reflects greater disability. The NDI has been demonstrated to be a reliable and valid tool for the assessment of neck disability.[19] It has been recently reported that intraclass correlation coefficient ranges from 0.50 to 0.98, suggesting that the NDI has sufficient support and usefulness to be the most commonly used self-report outcome for neck pain.[20]

Sleep Quality Assessment

The Pittsburgh Sleep Quality Index (PSQI) is the most common used standardized questionnaire for the comprehensive assessment of sleep quality.[21] The PSQI appraises sleep quality over a 1-month period through a standardized questionnaire differentiating between good and poor sleepers. It consists of 19 self-rated questions, and 5 questions answered by bedmates/roommates. The PSQI items use varying response categories that include recording usual bed time, usual wake time, number of actual hours slept, and number of minutes to fall asleep as well as forced-choice Likert-type responses (0-3). The sum of the scores for the components yields 1 global score, which ranges from 0 to 21, where higher score indicates worse sleep quality.[22] Buysse et al[22] reported that the PSQI has good internal consistency ($\alpha = .83$) and test-retest reliability ($r = 0.85$). A total score greater than 8.0 has been found to be indicative of poor sleep quality.[23]

Trigger Point (MTrP) Examination

Myofascial trigger points were bilaterally explored in the upper trapezius, sternocleidomastoid, splenius capitis, semispinalis capitis, levator scapulae, and scalene muscles by an