Journal of Bodywork & Movement Therapies (2016) 20, 397–408

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/jbmt

REVIEW: CLINICAL REVIEW SECTION

A critical overview of the current myofascial pain literature — March 2016

Jan Dommerholt, PT, DPT, DAAPM [a,b,*],
Todd Hooks, PT, ATC, OCS, SCS, FAAOMPT [c],
Michelle Finnegan, PT, DPT, OCS, FAAOMPT [a,b],
Rob Grieve, PT, Ph.D [d]

[a] *Bethesda Physiocare, Bethesda, MD, USA*
[b] *Myopain Seminars, Bethesda, MD, USA*
[c] *New Orleans Pelicans, New Orleans, LA, USA*
[d] *Department of Allied Health Professions, Faculty of Health and Applied Sciences, University of the West of England, Blackberry Hill, Bristol, United Kingdom*

KEYWORDS
Myofascial pain syndrome;
Trigger points;
Dry needling;
Manual therapy;
Reviews

Summary The worldwide interest in myofascial pain syndrome (MPS) and trigger points (TrPs) is reflected in the increasing number of publications. In this overview of the literature, we included 26 studies, case reports and review articles by authors from 18 different countries. Several research groups are exploring the characteristic of TrPs such as Chen and colleagues, who continued their work on the quantification of the taut bands. Meng and colleagues studied the relationships between TrPs and central sensitization, while Yu and colleagues examined the electrophysiological characteristics that occur as a result of active TrPs. Several researchers used objective measurements to determine clinical outcomes, such as Koppenhaver and colleagues who measured objective changes in the function and nociceptive sensitivity of lumbar multifidus muscle subjects with low back pain. Turo and colleagues quantified muscle tissue changes after dry needling in chronic myofascial pain using elastography. Multiple studies explored various treatment options for TrPs, such as dry needling, injections with lidocaine or granisetron, traditional Thai massage, self-myofascial release, kinesiotaping, and monochromatic infrared photo energy, among others.

* Corresponding author. Bethesda Physiocare, 4405 East West Highway, Suite 403, Bethesda, MD, 20814-4535, USA.
E-mail addresses: dommerholt@myopainseminars.com (J. Dommerholt), trhooks@hotmail.com (T. Hooks), mbfpt77@gmail.com (M. Finnegan), Rob.Grieve@uwe.ac.uk (R. Grieve).

http://dx.doi.org/10.1016/j.jbmt.2016.02.015
1360-8592/

Basic research

Chen, Q, Wang, HJ, Gay, RE, Thompson, JM, Manduca, A, An, KN, Ehman, RE, Basford, JR. 2016. Quantification of myofascial taut bands. Archives of Physical Medicine and Rehabilitation. 97(1):67–73.

This is an important study from the US exploring the correlation between clinicians identifying taut bands compared to the findings with magnetic resonance elastography (MRE) imaging. Previous studies have established that MRE can be used to quantify taut bands (Chen et al., 2008b, 2007), but the correlation with clinical practice has not been studied. Sixty-five subjects were examined for the presence of taut bands in the upper trapezius muscle by skilled physicians and subsequently examined with MRE. Shear waves were induced with a pneumatic transducer. The researchers determined the MRE intra- and inter-rater reliability.

Of the 30 intra-rater reliability subjects, 16 (53.3%) were identified with a taut band, but 12 (40.0%) were found not to have a taut band. The kappa coefficient was almost perfect (0.86; 95% CI, 0.68–1.00), pointing to excellent intra-rater reliability. Of the 35 inter-rater reliability subjects, 25 (71.4%) had taut bands and 9 (25.7%) did not. The inter-rater reliability was excellent. All subjects had taut bands based on physical examination and 41 (63.1%) were confirmed by MRE.

This study confirms several assumptions made by clinicians worldwide. Taut bands are real. They are stiffer than surrounding muscle tissues and located in the direction of muscle fibers. The finding that one third of the taut bands identified by experienced clinicians were not visualized with MRE is intriguing and could point to an inability of MRE to detect bands that clinicians may be able to locate. Clinicians may have a higher probability of identifying narrow taut bands than MRE. On the other hand, clinicians may be biased towards finding taut bands when they are convinced that subjects may have myofascial pain. One significant limitation of the study, as acknowledged by the authors, is that the MRE operators were not blinded, but the researchers did not feel that blinding would have changed the outcomes.

Itza, F, Zarza, D, Salinas, J, Teba, F, Ximenez, C, 2015. Turn-amplitude analysis as a diagnostic test for myofascial syndrome in patients with chronic pelvic pain. Pain Research & Management, 20(2): 96–100.

The main aim of this case control study was to validate the turns-amplitude analysis (TAA) as a diagnostic test for myofascial pain syndrome of the pelvic floor (MPSPF) in patients with chronic pelvic pain (CPP). A total of 128 participants were included, with 64 patients with CPP and 64 control patients. The researchers reported in their results that in patients and control subjects, the sensitivity and specificity of the proposed diagnostic test (TAA) showed a marked clinical significance: the sensitivity was 83%, and the specificity was 100%. They concluded that TAA is a reliable diagnostic test to detect MPSPF and that further studies are needed to reproduce these results. Strangely, the paper does not define TAA. The authors seem to assume that the reader would already have an understanding of TAA. To clarify TAA, we need to go back to 1983 when Stalberg introduced the TAA method as a specific method to analyze EMG readings by plotting the turns per second against the mean amplitude change/turn in an XY-diagram, which they called the so-called turns amplitude analysis (Stalberg et al., 1983). The method enables clinicians to determine whether a pathological condition is neurogenic or myopathic in nature.

There are known reliability and validity issues in the literature on objective methods of diagnosing TrPs and resultant myofascial pain. Unfortunately this study has a few limitations associated with the conducting and reporting that may affect the researchers claim that TAA is a reliable diagnostic test to detect MPSPF. Firstly on a basic level, there is no information in the introduction on exactly what is TAA? The EMG/TAA protocol is not clearly laid out or outlined for any attempt at replication of the EMG procedure. More specific detail is required on exactly what are the diagnostic criteria for TrPs identification (Simons et al. 1999). More importantly even, how were the researchers able to identify taut bands, local twitch response and pain sensitivity of deep pelvic muscles? As in the TAA protocol, what were the exact protocols and positioning for digital palpation of pelvic TrPs? Further to this review, please see the Letter to the Editor of Pain Research & Management by Kumbhare and Robinson (Kumbhare and Robinson, 2015).

Meng, F, Ge, HY, Wang, YH, Yue, SW, 2015. A afferent fibers are involved in the pathology of central changes in the spinal dorsal horn associated with myofascial trigger spots in rats. Experimental Brain Research, 233(11):3133–3143.

Experienced researchers from China and Denmark conducted a laboratory-based study to ascertain if myofascial TrPs are associated with central sensitization, specifically, if A afferent fibers are associated with TrPs in central sensitization and to determine the size of TrP related neurons in the dorsal root ganglia and the spinal ventral horn. According to the researchers, previous clinical studies have used more subjective measurements (Visual Analog Scale and Pressure Pain Threshold) to confirm the relationship between TrPs and central sensitization. This study using more direct morphological evidence builds on the previous laboratory based investigations by the same researchers on the affect of myelinated afferents on the spontaneous electrical activity (SEA) and hyperalgesia of TrPs (Meng et al., 2015).

Sixty-four adult male rats were lightly anesthetized. Palpable taut bands, myofascial trigger spots (MTrSs, equivalent to human TrPs), and a latent twitch response (LTR) were identified in the biceps femoris muscle. Cholera toxin B subunit-conjugated horseradish peroxidase was applied to label the MTrS-related neurons, and tetrodotoxin (TTX) was used specifically to block A fibers. The results showed that in the spinal dorsal horn associated with MTrS, the expression of glutamate receptor (mGluR1α/mGluR5/NMDAR1) increased, while the mean size of MTrS related neurons was smaller than normal. After blocking A afferent fibers with TTX, these changes reversed to some extent, therefore the researchers inferred that A afferent fibers were associated with these changes. The overall conclusion