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REVIEW: CLINICAL REVIEW

A critical overview of the current myofascial pain literature – March 2017

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A B S T R A C T

After two years of having contributed to this overview series of articles, we sadly say goodbye to Dr. Rob Grieve. We would like to thank Dr. Grieve for his insightful contributions and analyses of the myofascial pain literature. Dr. Grieve would have preferred to continue, but his many university and research responsibilities had to take priority. We are looking forward to reviewing his future research endeavors in this article. We are pleased that Dr. Li-Wei Chou, MD, PhD has agreed to replace Dr. Grieve and join our team. Dr. Chou is Assistant Professor at China Medical University in Taichung, Taiwan and he has an impressive publication record with many research studies and book chapters.

In this edition of the overview article, we once again have included articles from around the world with a combination of basic research and clinical studies and case reports. The majority of papers deal with dry needling, but there are also several more basic research studies and manual therapy papers.

1. Basic research

Barros-Neto JA, Souza-Machado A, Kraychete DC, Jesus RP, Cortes ML, Lima MdS, Freitas MC, Morganna de Morais Santos T, de Sousa Viana GF, & Menezes-Filho JA. 2016. Selenium and zinc status in chronic myofascial pain: serum and erythrocyte concentrations and food intake. PLoS ONE, 11(10):e0164302

Researchers in Brazil conducted a case control study to assess the dietary intake, serum and erythrocyte levels in patients with chronic myofascial pain. The rationale for this study was based on evidence suggesting that deficiencies of selenium and zinc may be associated with the pathophysiological process in chronic painful musculoskeletal disease. Sixty-two participants were recruited, and allocated to a chronic myofascial pain group (n = 31) and a control group (n = 31). A dietary record over five days of food intake were used and the serum and erythrocyte concentrations of selenium and zinc were analysed using atomic absorption spectrophotometry. Pain intensity was assessed with a visual analog scale (VAS). Information regarding gender, age, marital status, and socioeconomic and environmental conditions was gathered, including the amount of alcohol consumption and physical activity level. Measurements of weight, height and body mass index (BMI) were also conducted. A clear protocol for the diagnosis and identification of TrPs was reported for the myofascial pain group in one or more of the following muscles: the trapezius, infraspinatus, gluteus maximus, quadratus lumborum, and levator scapulae.

Overall the results indicated that the group of patients with chronic myofascial pain, showed a lower erythrocyte (intracellular) concentration of selenium and zinc compared to the control group. Interestingly, both groups showed a reduced food intake of zinc in the majority of participants. Although, the selenium intake was considered to be safe in 80% of the participants in both groups, the likelihood of inadequate intake of this mineral was twice as high in the myofascial pain group. Physical inactivity and obesity were more common in the myofascial compared to the control group. Overall this was a well-conducted case-control study, with an author acknowledged limitation in the subjectivity and reliability of the VAS scale. Pressure pain threshold (PPT) for pain intensity and prevalence figure of TrPs in individual/overall muscles could have been included. Overall this study is useful in adding to the growing

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knowledge of the mechanisms and pathophysiology of chronic musculoskeletal pain.

Kaya Mutlu E, Birinci T, Dizdar G, & Ozdincler AR, 2016. Latent trigger points: What are the underlying predictors? Archives of Physical Medicine & Rehabilitation, 97(9):1533–1541.

Researchers from the University of Istanbul conducted a cross-sectional study to determine predictive factors on 242 subjects for the presence and number of latent TrPs in healthy individuals. Two hundred forty-two subjects (133 women and 109 men ages 18–35) currently without neck or shoulder pain, history of surgery of the neck or shoulder, and active TrPs were enrolled in this study. Subjects were evaluated using questionnaires to assess disability (Quick-Disabilities of the Arm, Shoulder, and Hand [Quick DASH], and the Neck Pain and Disability Scale [NPAD]), psychological factors (Brief Symptom Inventory [BSI], Beck Depression Inventory [BDI], State-Trait Anxiety Inventory [STAI], and the Perceived Stress Scale [PSS]), quality of life (Short-Form-12 [SF-12]), smoking habits (current smoking status [never, former, current] and Fagerström Test for Nicotine Dependence), and pain during times of activity using the Visual Analog Scale (VAS). TrPs were evaluated bilaterally in the sternocleidomastoid, levator scapula, upper trapezius, scalenus, supraspinatus, infraspinatus, pectoralis major, pectoralis minor, and teres major muscles by a physical therapist with 11 years' experience and were divided into two groups based upon the presence of latent TrPs. Group 1 consisted of 68 subjects without latent TrPs, and Group 2 was comprised of 174 subjects with latent TrPs. The authors reported pain predicated the presence of latent TrPs, while pain and age were significant predictors of the number of latent TrPs in healthy subjects.

The direct relationship between depression, quality of life, disability, and sleep in chronic cervical myofascial pain and chronic widespread pain has been shown; however, predictive factors to determine both the presence and number of latent TrPs in healthy individuals is limited (Çelik and Mutlu, 2012; Altindag et al., 2008). Although latent TrPs do not feature spontaneous pain, as do active TrPs, they may predispose individuals to muscle dysfunction and perpetuating factors that can lead to active TrPs (Çelik and Mutlu, 2012). Therefore identifying factors in healthy individuals that may predict latent TrPs may aid the clinician in providing treatment to prevent any potential resultant dysfunction and progression into active TrPs.

Perez Costa E, Torres-Lacomba M, 2016. Presencia de puntos gatillo miofasciales en futbolistas de competicion con dolor de tobillo: estudio piloto transversal (in Spanish: Presence of myofascial trigger points in professional football players with ankle pain: Cross-sectional study). Fisioterapia, 38(6):280-285

Seventeen professional soccer players (18–27 years of age) with complaints of ankle pain were examined for the presence of active and latent TrPs in 10 different muscles using the diagnostic criteria described by Travell and Simons, (2004). Although ankle injuries are very common among soccer players, the nature of the injury mechanisms is not always well defined, and may include tarsal tunnel syndrome or antereo-lateral impingement as McMurray described over 60 years ago (McMurray, 1950). More recently, Grieve and colleagues have documented the impact of TrP in the calf muscles (Grieve et al., 2013b). Whether TrPs are involved in complaints of ankle pain in professional soccer players has not been investigated to date. Spanish researchers Perez Costa and Torres-Lacomba examined the tibialis anterior and posterior, the extensor and flexor digitorum longus, the medial head of the gastrocnemius, the soleus, and the peroneal (fibularis) muscles in each of the players. They found active and latent TrPs in 4% and 27% of the muscles, respectively. The tibialis anterior and peroneus (fibularis) longus muscles were most commonly involved. Pain levels were reported as 2.7 on a visual analog scale ranging from 0 to 10. The authors concluded that latent TrPs are very common in professional soccer players with ankle pain, which seems contrary to the findings as the vast majority of the players did not have a significant number of TrPs. They recommend initiating larger scale prospective studies to explore whether there is a causal relationship between the presence of TrPs and pain.

2. Manual therapy and soft tissue approaches

Espejo-Antúnez L, Castro-Valenzuela E, Ribeiro F, Albornoz-Cabello M, Silva A, & Rodríguez-Mansilla J. 2016. Immediate effects of hamstring stretching alone or combined with ischemic compression of the masseter muscle on hamstrings extensibility, active mouth opening and pain in athletes with temporomandibular dysfunction. Journal of Bodywork and Movement Therapies, 20(3):579-587

Researchers from Spain and Portugal completed a randomized, single-blind controlled trial to assess the immediate effect of a single stretch to the bilateral hamstrings muscles versus a single stretch to the bilateral hamstring muscles combined with ischemic compression of masseter TrPs on the extensibility of the hamstrings, maximum mouth opening (MMO), pressure pain threshold (PPT) of masseter TrPs, and pain intensity in athletes diagnosed with temporomandibular dysfunction (TMD) and hamstring shortening. Of the 53 athletes who volunteered for the study, 42 met the inclusion and exclusion criteria. Outcome measures were assessed before and immediately after treatment by two physical therapists, who were blinded to the treatment groups. Outcome measures included hamstring extensibility via the active knee extension test, PPT of a central masseter TrP with a mechanical pressure algometer, pain intensity of palpation of the masseter TrP with a Visual Analog Scale (VAS), and MMO with a calibrated caliper in supine. The hamstring stretching was performed with a hold relax proprioceptive neuromuscular facilitation technique, with an 8 s contraction followed by an 8 s relaxation. This was repeated three times, with a stretch to the hamstring following the final contraction. This stretching technique was performed in both treatment groups. In the group that also received the ischemic compression to the masseter muscle bilaterally, this was performed after the hamstring stretching. The central TrP of the masseter was compressed and held for 90 s. If there was a 50% decrease in the pain then pressure was increased again until there was some pain.

Results of the study revealed that both treatment groups showed improvements in MMO, hamstring extensibility, PPT of the masseter, and pain intensity with masseter muscle palpation. The additional treatment to the masseter did not make any further changes on the outcome measures compared to the hamstring stretching alone. This article offers some interesting results for making changes in the patients diagnosed with TMD without directly working on that area. There are, however, a few limitations of the study. It was not clear how TrPs were identified in the masseter muscle. It was only stated that the central TrP was assessed with pressure algometry and treated with ischemic compression. Typically criteria for identification of a TrP are described by Simons et al., (1999). The experience level of the clinicians in TrP identification and myofascial pain was also not clearly stated, yet the experience level is known to have an impact on correct identification (Myburgh et al., 2011; Mora-Relucio et al., 2016). Furthermore, for the ischemic compression of the masseter muscle it was not clearly stated what steps were taken if the pain did not decrease by 50% at the end of 90 s. It was also not clear how many times this procedure was performed and if it was to both masseter muscles simultaneously or individually. As we have