

Myofascial Pain Syndromes— Trigger Points

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INTRODUCTION

This review illustrates the broader acceptance of myofascial trigger points [TrPs] in several fields. The Canadian Society of Obstetricians and Gynaecologists recently endorsed clinical guidelines for the management of chronic pelvic pain which included TrPs as an essential component of comprehensive medical and gynecological care. In Spain, an entire issue of the physical therapy journal was devoted to TrPs with excellent contributions of prominent Spanish physical therapists trained in the identification and management of TrPs. Following the translation of the *Trigger Point Manuals* into Spanish (1,2), many Spanish universities are now offering highly specialized certification programs in manual and invasive TrP therapy. Robert Gerwin published an authoritative review article outlining several factors that contribute to the chronicity of fibromyalgia syndrome and myofascial pain syndrome. Each article review indicates whether it is prepared by Simons [DGS] or Dommerholt [JD].

CLINICAL STUDY

Botulinum toxin A versus bupivacaine trigger point injections for the treatment of myofascial pain syndrome: A randomized double blind crossover study: C. L. Graboski, D. S. Gray, R. S. Burnham, Pain 118: 170-175, 2005.

Summary

Seventeen subjects, who were recruited from two private practices and had myofascial trigger points [TrPs] in posterior postural muscles, received pre-test bupivacaine injections in those TrPs. They were included because they reported more than 50 percent pain relief for at least eight hours but for not more than one month. They continued taking their regular pain medications. The TrP definition was “a discrete hyperirritable spot located in a taut band of skeletal muscle.” The only etiologies the authors identified were localized spasm and a dysfunctional muscle spindle. This double blind, randomized, cross-over study compared the results of injecting bupivacaine or Botulinum toxin A [BTX A] into a maximum of eight TrPs per subject. Based on weekly reports, when the pain ratings on the Likert type Visual Analog Scale returned to 75 percent or more of the pre-injection rating, the other drug was injected after an additional two-week washout period. All patients participated in the same home-based rehabilitation program throughout the study. Both treatments reduced the pain compared to baseline [$P = 0.0067$] significantly statistically. However, there was no statistical difference between the two treatments in duration or magnitude of pain relief, patient ratings on a patient-specific function scale, or patient satisfaction with the degree of pain re-

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lief on a long-term basis, or relief immediately following treatment. Comparing the two drugs and considering the much greater cost of BTX, bupivacaine was preferred for first line treatment.

Comments

This study conforms to high scientific standards with results that correspond to our conviction that there are equally or more effective and much less expensive treatments for TrPs than BTX A injections. In keeping with the expectation of the authors that the duration of relief obtained with BTX A would be longer than relief with bupivacaine injection was reflected in the graph of their results. However, the difference between the two treatments was far from statistically significant. Unfortunately, the authors have a limited understanding of current literature on TrPs.

The only etiologies the authors identified were localized spasm and a dysfunctional muscle spindle, totally ignoring the credible integrated hypothesis (3). Nothing was said specifically what diagnostic criteria were employed to identify TrPs in these subjects and precious little about the injection technique per se. The authors are apparently unaware of the critical therapeutic difference between any needling that induces a local twitch response from the TrP and needling that doesn't. They made no mention of it. The initial treatment of the subject's TrPs with bupivacaine to assure an effective short-duration response that did not last indicates that they were unaware of, or unconcerned about, perpetuating factors that needed correction to obtain much more lasting results. There is much more to the effective treatment of TrPs than simply administering an injection.

The take-home lesson from this study is to recognize how many other methods of treatment are at least as effective as these injections, that are non-invasive, and many of which the patients can learn to do for themselves: manual therapy techniques like pressure release, contract-relax, reciprocal inhibition, and the new modality frequency specific microcurrent therapy. Dry needling that elicits local twitch responses is invasive, but another effective alternative to the injection of drugs, especially when

they may cause undesirable immune system responses like BTX A is known to do [DGS].

REVIEW ARTICLE

A review of myofascial pain and fibromyalgia—factors that promote their persistence: R.D. Gerwin. *Acupunct Med* 23:121-134, 2005.

Summary

Pain from a myofascial trigger point [TrP] is localized to one region of the body, but often refers to some distance. Myalgias often show no diagnostic laboratory abnormalities. The referred pain is secondary to a primary peripheral source and is mediated at spinal cord level by sensitization phenomena. Both TrPs and fibromyalgia syndrome [FMS] exhibit muscle tenderness but otherwise are distinct entities: FMS is a syndrome of central sensitization and widespread musculoskeletal pain and tenderness, whereas, TrP pain results from local muscle metabolic stress following muscle overload that produce reproducible characteristic physical findings. Numerous nociceptive substances are present in significant amounts at the TrP. With multiple TrPs, clinical symptoms can mimic TrPs so many cases of TrPs have been misdiagnosed as FMS due to poor muscle palpation techniques. The two conditions can aggravate each other and comorbidity is common.

Fibromyalgia syndrome is a chronic myalgia that is widespread, confirmed with the diagnostic criteria published by the American College of Rheumatology that do not distinguish FMS from the more common TrPs. The FMS is associated with multiple additional systemic symptoms including, sleep disturbance, fatigue, irritable bowel syndrome, interstitial cystitis, dyspareunia, etc. Imaging and laboratory testing is needed to identify comorbid conditions or other causes of the chronic myalgia. The central sensitization with amplification of nociception results in a broad array of stimuli being perceived as more painful than normal. Numerous nociceptive-stimulating substances are identified as increased in many patients with FMS. The long-term prognosis indicates

some degree of relief in time. Treatment of FMS includes multiple drug therapies, and progressive exercise with cognitive therapy.

Myofascial TrPs can produce pain and muscle dysfunction in any part of the body and are identified by a distinctive taut band and pain with tenderness, a distinguishing duality of motor and sensory dysfunction. The taut band, that is reliably identifiable clinically, is also significantly associated with low amplitude endplate noise and high-amplitude endplate spikes, recorded using delicate needle electromyography technique. Effective needling a TrP results in a perceptible twitch of the taut band. The associated endplate noise is reduced 22 percent by phentolamine infusion, identifying a significant contribution to TrPs activation by sympathetic nervous system activity. These well-established characteristics of TrPs are explained by the integrated hypothesis.

Inhibition of muscle function by TrPs results in compensatory overload of other muscles in that functional unit. This leads in time to propagation and spread of TrPs throughout the body.

Systemic perpetuating factors include nutritional deficiencies, hormonal dysfunctions, and chronic infections. Important and common nutritional deficiencies are vitamin B12 deficiency, Iron deficiency, and vitamin D deficiency, all of which can be corrected with adequate replacement therapy or improved dietary and behavioral habits. Hormonal dysfunctions include hypothyroidism that can also be the result of a chronic or critical illness, the enigmatic role of reverse T3, and growth hormone deficiency. Lyme disease is a treatable chronic infection likely to aggravate TrPs. When poor response to treatment indicates the presence of a perpetuating factor, appropriate laboratory studies are required to identify the above factors.

Effective treatment of TrPs requires inactivation of TrPs, restoration of normal muscle length [range of motion] and elimination or correction of initiating and perpetuating factors. Effective treatments include manual therapy release techniques such as TrP compression, gently lengthening the tense muscle, or local stretch of the tense taut band. Release of the fascia associated with the muscle [myofascial release] is helpful. Each technique is muscle specific.

Needling the TrP, either dry or with anesthetic, is effective when a twitch response is elicited. Acupuncture is reported to have some effectiveness. When indicated, ergonomic work factors and psychological stresses must be addressed.

Comments

Overall, this is an authoritative, accurate, concise summary of the nature of TrPs and FMS. Although referred pain commonly appears in areas innervated by the same spinal segment, the sensitization of spinal sensory neurons responsible for the referred pain phenomenon is not restricted to the same spinal segment, but may involve several other segments as well. As indicated, pain from TrPs is easily misdiagnosed as FMS, but it is also important to remember that FMS patients frequently also have TrPs that make a major contribution to their pain and aggravate the FMS. An important identifying feature of FMS is compromised clarity of thinking, intermittent loss of short term memory, and increased distractibility with loss of capacity for multitasking.

Myofascial TrPs not only cause the motor abnormality of a taut band through the TrP, but also even latent TrPs can cause inhibition and increased motor activity of the same and functionally related muscles—an important but poorly recognized feature of TrPs. Actually, excessive acetylcholine release at the motor endplate can increase the frequency of endplate noise not only 10-100 times, but sometimes 1,000 times as unequivocally demonstrated in physiological experiments (4). Many other factors can affect that endplate noise.

The extensive discussion of the controversial role of reverse T3 thyroid hormone suggests that it deserves additional research attention.

In addition to the well-known TrP therapies that were discussed, there is a remarkably promising new modality, frequency specific microcurrent, that deserves serious consideration and further clinical trials (5-7) [DGS].

CONSENSUS GUIDELINES

Consensus guidelines for the management of chronic pelvic pain: J.F. Jarrell, G.A. Vilos, C. Allaire, S. Burgess, C. Fortin, R. Gerwin, L. Lapensee, R.H. Lea, N.A. Leyland, P. Martyn, H. Shenassa, P. Taenzer, B. Abu-Rafea. *Obstet Gynaecol Can.* 27(8): 781-826 and 27(9): 869-887, 2005.

Summary

This two-part article is a thorough consensus document on the management of chronic pelvic pain [CPP] approved by the Society of Obstetricians and Gynaecologists of Canada. The paper is divided into 14 different chapters including an introductory chapter to various physiological aspects of chronic pain, chapters on definitions, history taking, physical examination, sources of CPP, management of CPP, surgery, and multidisciplinary pain management. Chapter seven [published in the second half of the paper] is the most relevant chapter in the context of this review as it deals specifically with myofascial dysfunction. The chapter is prepared by Drs. Robert Gerwin, Paul Martyn, and John Jarrell. The chapter reviews in detail the prevalence of myofascial pain in CPP, a review of pathophysiological aspects, and provides specific clinical guidelines for diagnosis and management of myofascial pain in a gynecological setting. The authors determined three levels of muscle examinations, which together cover a comprehensive examination of the abdominal muscles, the hip adductors, the quadratus lumborum, lumbar paraspinal muscles, gluteal muscles, psoas, obturator internus, piriformis, and internal pelvic floor muscles. The authors emphasize that management of CPP involves not only medical management with injection therapy, but requires physical therapy and in many cases a true multidisciplinary pain management approach. In summary, the chapter concludes with the recommendation that health care providers should become more aware of myofascial dysfunction as a cause of CPP and its available treatment options.

Comments

This consensus document endorsed by the Canadian Society of Obstetricians and Gynaecologists is a remarkable step forward in the recognition of myofascial pain and myofascial trigger points [TrPs] in CPP. One of the primary authors, Dr. John Jarrell, has undertaken specific training in the recognition and management of TrPs, and has subsequently published several of his experiences and research (8,9). Awareness of the importance of TrPs in CPP is slowly growing, but there is still a long way ahead before gynecologists, obstetricians, urologists, and other health care providers routinely will consider TrPs in the diagnosis and management of their [pelvic] pain patients. This paper is a very strong endorsement of the importance of TrPs by a national medical society [JD].

BRIEF REVIEWS

Crterios diagnsticos y caractersticas clnicas de los puntos gatillo miofasciales [in Spanish: Diagnostic criteria and clinical features of myofascial trigger points]. J.M. Martnes Cuenca, D. Pecos Martn. *Fisioterapia* 27(2):65-68, 2005.

The first article in an issue of the Spanish physical therapy journal devoted to myofascial trigger points provides a brief and succinct review of the main clinical features of trigger points, including a taut band, local and referred pain, and muscle weakness. The diagnostic criteria are included consistent with the second edition of the first volume of the *Trigger Point Manual* (10) [JD].

Fisioterapia invasiva del sndrome de dolor miofascial [in Spanish: Invasive physical therapy in myofascial pain syndrome]. O. Mayoral del Moral. *Fisioterapia* 27(2):69-75, 2005.

The author reviews the current understanding of the mechanisms of trigger point dry needling. He emphasized that dry needling can be used diagnostically and therapeutically. Real-

izing that there are only a limited number of randomized controlled studies on the effectiveness of dry needling, dry needling appears to be equally effective when compared to trigger point injections. There are few complications of dry needling, such as causing a pneumothorax. However, the risks can be minimized by good technique and adequate precautions. More research is needed to further explain the mechanisms of superficial and deep dry needling. Physical therapists in Spain are legally allowed to use trigger point dry needling as long as they can demonstrate proficient training in the technique. Several universities offer myofascial pain certification programs. At this time, eight states in the United States have determined that dry needling falls within the scope of physical therapy practice, including New Hampshire, Maryland, Virginia, South Carolina, Georgia, New Mexico, Kentucky, and Colorado [JD].

Factores que promueven la persistencia de mialgia en el síndrome de dolor miofascial y en la fibromialgia [in Spanish: Factors that promote persistent myalgia: myofascial pain and fibromyalgia]. R.D. Gerwin. *Fisioterapia* 27(2):76-86, 2005.

This article is the Spanish version of Gerwin's article recently published in *Acupuncture in Medicine* [reviewed above] and translated by Mayoral del Moral. In addition to translating two articles in this series, Mr. Mayoral del Moral has translated the trigger point manuals into Spanish (1,2) [JD].

Dolor miofascial crónico: patofisiología y aproximación terapéutica [in Spanish: Chronic myofascial pain: pathophysiology and therapeutic approach]. R. Torres Cueco. *Fisioterapia* 27(2):87-95, 2005.

The author places the management of chronic pain as a result of myofascial trigger points in a much broader context of recent advances in the pain sciences. Torres Cueco provides a detailed overview of the mechanisms of peripheral and central sensitization and advocates considering chronic pain as a complex interaction of biological, psychological, and social phenomena.

The release of trigger points is rarely sufficient in the management of persons with chronic myofascial pain and indeed a comprehensive multidisciplinary approach is indicated [JD].

Síndrome de dolor miofascial. Casos clínicos [in Spanish: Myofascial pain syndrome. Case reports]. I. Salvat Salvat. *Fisioterapia* 27(2):96-102, 2005.

The author reviewed 53 case reports that were part of a certification program in conservative and invasive physical therapy for myofascial pain syndrome at the University of Castilla-La Mancha. The objective of this analysis was to determine how knowledge of myofascial pain contributes to the physical therapy approach of a wide variety of patients. In her review, the author concluded that trigger point therapy becomes a fundamental component of physical therapy. In addition, she determined that a diagnosis of myofascial pain syndrome provided a more accurate description of otherwise rather vague medical diagnoses, such as low back pain. Patients suffering from other medical illness, including orthopedic, rheumatologic, neurological, internal medicine, and traumatic ailments can benefit from manual and invasive myofascial trigger point therapy [JD].

Revisión de los enigmáticos puntos gatillo miofasciales como causa habitual de dolor y disfunción musculoesqueléticos enigmáticos [in Spanish: Review of enigmatic MTrPs as a common cause of enigmatic musculoskeletal pain and dysfunction]. D.G. Simons. *Fisioterapia* 27(2):103-120, 2005.

The last article in this series in the Spanish physical therapy journal is a translation of a previously published article by Simons in the *Journal of Electromyography and Kinesiology* (3). In essence, the article explored several reasons why the existence of myofascial trigger points is not widely accepted and offered suggestions for future research. The original article was reviewed in the *Journal of Musculoskeletal Pain*, Vol. 13(2):63-74, 2005 (11). Mayoral del Moral was responsible for the translation into Spanish [JD].

Myofasciale triggerpoints; een aanvulling [in Dutch: Myofascial trigger points; addendum]. J. Dommerholt, C. Bron, J. Franssen. FysioPraxis Nov: 36-41, 2005.

In a previous edition of this review column, we reviewed two myofascial trigger points [TrPs] articles by Timmermans published in the Dutch physical therapy journal (12, 13). At that time, we expressed our concerns regarding Timmermans' incomplete and at times incorrect descriptions of the pathophysiology of TrPs and of the integrated TrP hypothesis (14). The current article expanded our critique of Timmermans' articles in a formal reply to the Dutch physical therapy journal. In spite of the criticism, the article acknowledged the contributions of Timmermans for bringing TrPs to the attention of Dutch physical therapists [JD].

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