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### Myofascial Pain Syndrome—Trigger Points

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*LITERATURE REVIEW*

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## Myofascial Pain Syndrome—Trigger Points

Jan Dommerholt, PT, MPS  
David G. Simons, MD

### *INTRODUCTION*

This issue has a double first. Two rheumatologists have published informative papers in prestigious rheumatology journals on the subject of myofascial trigger points [TrPs], a subject that has been commonly neglected by that specialty. A paper by a third rheumatologist stands in stark contrast to the papers by the other two. The review starts off with a new TrP reliability study from the Netherlands, which confirms that trained examiners can reliably palpate TrPs. The importance of TrPs in migraine, abdominal and pelvic pain, shoulder pain, and tinnitus was examined in several papers. Unfortunately, TrPs were sometimes poorly defined without clear definitions and criteria. Several studies explored injection and dry needling of TrPs. Research papers from 11 different countries are included in this review [Table 1]. As usual, each article review indicates whether Dommerholt [JD] or Simons [DGS] prepared it.

### *RESEARCH STUDIES*

**Bron, C, Franssen, J, Wensing, M, Oostendorp, Rab: Interrater Reliability Of Palpation Of Myofascial Trigger Points In Three Shoulder Muscles. *J Manual Manipulative Ther* 15(4): 203–215, 2007**

#### *Summary*

Thirty-two patients with unilateral or bilateral shoulder pain and eight asymptomatic subjects were included in this study of the interrater reliability of palpating myofascial trigger points [TrPs]. Patients had been diagnosed with subacromial impingement, rotator cuff disease, tendonitis, tendinopathy, and chronic subdeltoid-subacromial bursitis. To be considered for the study, subjects were between 18 and 75 years of age with an ability to read and understand the Dutch language. Exclusion criteria included serious rheumatologic, neurological, orthopedic, or internal diseases.

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TABLE 1. Country of Origin of Reviewed Papers

Country of Origin	Number of Papers
Brazil	1
Canada	1
Greece	1
Italy	1
Japan	1
Korea	1
The Netherlands	1
Spain	2
Taiwan	1
United Kingdom	1
United States	5

Three physical therapists with experience in the identification and management of TrPs examined the subjects for the presence of TrPs in the infraspinatus, anterior deltoid, and biceps brachii muscles for a total of 12 TrPs. The muscles were examined for the presence of a taut band with a nodule, a painful sensation during compression of the palpable nodule in comparison to established referred pain patterns, the presence of a visible or palpable local twitch response during snapping palpation, and the presence of a general pain response during palpation, referred to as a jump sign. The therapists were blinded to the status of the patients and did not know whether they were symptomatic. As a result of the study design, the examiners did not distinguish between active and latent TrPs, and the subjects were not allowed to report whether they recognized the elicited pain. An observer was present during all examination to verify correct implementation of the testing procedures, but the observers did not interfere with the examination. Both the examiners and observers participated in a total of eight hours of training and reached consensus about all aspects of the examination.

The researchers determined both the percentages of agreement [PA] and the pair-wise Cohen Kappa values [ $\chi$ ]. The PA value for identifying a palpable nodule in a taut band ranged from 45 percent in the medial head of the biceps to 90 percent in the infraspinatus muscle. The  $\chi$  varied from 0.11 to 0.75. PA scores for eliciting referred pain were over 70 for most muscle locations with  $\chi$ -values ranging from -0.13 to 0.64. The presence of a jump sign varied between muscles. The raters reached a PA of 93 percent for the

infraspinatus muscle and 63 percent for another part of the infraspinatus and biceps brachii muscles. The  $\chi$ -values ranged from 0.07 to 0.68. The overall agreement on TrP presence or absence was acceptable for the infraspinatus muscle with PA values exceeding 70 percent. In the anterior deltoid and biceps brachii muscles the PA value was below 70 percent.

In the discussion section of the paper, the authors concluded that referred pain and a jump sign were the most reliable indicators of the presence of a TrP. There were clear differences in between various muscles and even in between different locations in the same muscle, especially for the nodule in the taut band, the local twitch response, and the jump sign. Compared with other commonly used examination tests, including muscle strength or the assessment of intervertebral motion, the interrater reliability was found to be acceptable. They noted that in clinical practice, the degree of agreement may increase as patients would be able to identify the clinical significance of the elicited pain.

#### Comments

This study from the Netherlands performed by a group of physical therapists is a welcome addition to the TrP literature and confirms the conclusions from other reliability studies that TrPs can be reliably palpated by trained and experienced examiners (1-3). The authors decided to blind the examiners to whether patients had active or latent TrPs and correctly concluded that in clinical settings, trained clinicians most likely would have reached higher degrees of agreement based on patients' feedback. In the era of evidence-based medicine, this study contributes to the body of literature firmly establishing TrPs as reliable clinical entities. The authors are congratulated on the publication of this well-executed study [JD].

**Cannon DE, Dillingham TR, Miao H, Andary MT, Pezzin LE: Musculoskeletal Disorders in Referrals for Suspected Cervical Radiculopathy. Arch Phys Med Rehabil 88: 1256-1259, 2007**

#### Summary

A total of 191 subjects with suspected cervical radiculopathy were included in this study.

The researchers determined the prevalence of several other musculoskeletal disorders, including myofascial pain, shoulder impingement syndrome, de Quervain's tenosynovitis, and lateral epicondylitis. Dependent on which muscles and myofascial trigger points [TrPs] are involved, myofascial pain can mimic cervical radiculopathy at several levels. A shoulder impingement may resemble a C5 radiculopathy. De Quervain's tenosynovitis and lateral epicondylitis may be confused for a C6 radiculopathy. In addition to determining the prevalence of these disorders, the authors were also interested in examining the influence of these disorders on electrodiagnostic study outcome prediction. Four US medical centers participated in the study.

All subjects completed a questionnaire and were examined using a standardized protocol. Myofascial pain was diagnosed if palpation of the neck or shoulder region produced symptoms. Shoulder impingement was diagnosed if crossed adduction, flexion, or abduction with internal rotation caused symptoms. Lateral epicondylitis was diagnosed if palpation of the wrist extensor muscles reproduced pain, and a positive Finkelstein test was determined to be indicative of de Quervain's tenosynovitis. A standard electrodiagnostic study was completed and included at least an upper limb motor nerve conduction study, one upper limb sensory nerve conduction study, and needle electromyography with either monopolar or concentric needles of 10 predetermined muscles. Additional tests were completed at the discretion of the electrodiagnostician. The study outcome was considered either normal, indicative of cervical radiculopathy, or indicative of another diagnosis. Irrespective of the electrodiagnostic outcome, all subjects were examined for the other musculoskeletal disorders.

Fifty-two percent of subjects included in the study had confirmed cervical radiculopathy, 24 percent had a normal study, and 25 percent had another diagnosis identified through electrodiagnosis, such as plexopathy; median, ulnar, or radial neuropathy; or polyneuropathy. The total prevalence of the other musculoskeletal disorders was 42 percent. The prevalence of subjects with a normal study was 69 percent, and 29 percent in subjects with cervical radiculopathy [ $P < 0.001$ ], and 45 percent in subjects with another diagnosis [ $P = 0.02$ ]. Myofascial pain was very

common among subjects with a normal electrodiagnostic study [53 percent] but also significantly more common in subjects with cervical radiculopathy [17 percent,  $P < 0.001$ ] and in subjects with other diagnoses [19 percent,  $P < 0.001$ ], suggesting that many subjects with myofascial pain may be referred for electrodiagnostic studies. Shoulder impingement was also common in normals [31 percent] and in subjects with another diagnosis [30 percent] but not as common with cervical radiculopathy [nine percent,  $P < 0.001$ ]. The diagnoses of lateral epicondylitis and de Quervain's was similar across the three groups and more common than in the general population. The presence of myofascial pain indicated approximately one fourth the likelihood of having cervical radiculopathy [ $P = .002$ ] and one third the likelihood of having another diagnosis [ $P = 0.017$ ] compared with a normal study. The presence of shoulder impingement indicated one fifth the likelihood of having cervical radiculopathy compared with a normal study [ $P = 0.007$ ]. It remains difficult to predict the outcome of electrodiagnostic studies based on the presence of musculoskeletal disorders. The authors acknowledged potential limitations of the study.

### Comments

Though the authors concluded that myofascial pain was very common among all three groups, the criteria used to diagnose myofascial pain were poorly defined. Presumably they attempted to palpate active TrPs to reproduce patients' symptoms, but there was no mentioning of palpating for taut bands or any indication of the level of experience of the examiners in identifying TrPs. The authors suggested that there may have been different levels of expertise and that more specific diagnostic criteria would have made the diagnosis more objective. The diagnosis of lateral epicondylitis was based on palpation of the wrist extensor muscles. Epicondylalgia may be due to TrPs, but again, the authors did not specify how the palpation was performed ... (4). Even the diagnosis of de Quervain's syndrome based on a positive Finkelstein test may not always be accurate. In the reviewer's clinical practice, a patient with pain in the first dorsal compartment had a positive Finkelstein test when the test was performed with the elbow extended. However, when the Finkelstein test

was performed with the elbow flexed, the test was negative. The patient was later diagnosed with an entrapment syndrome of the posterior interosseus nerve.

In summary, the results of this study would have been much more reliable if the diagnostic criteria were better defined and if the various examiners would have standardized their examinations techniques. Nevertheless, myofascial pain is a common differential diagnosis for cervical radiculopathy [JD].

### TREATMENT STUDIES

**Kuan LC, Li YT, Chen FM, Tseng CJ, Wu SF, Duo TC: Efficacy of Treating Abdominal Wall Pain By Local Injection. Taiwanese J Obstet Gynecol 45(3): 239–243, 2006**

#### Summary

This study by authors from the departments of obstetrics, gynecology, and nursing in Taiwan presented what is essentially a multiple case report of 140 patients with lower abdominal pain complaints. The patients [139 women and one man] showed evidence of myofascial trigger points [TrPs] that patients were able to identify rather accurately as the abdominal location of their pain. These patients had often received previous abdominal surgery and erroneous diagnoses of abdominal adhesions, pelvic inflammatory disease, and three nerve entrapments. On examination, they exhibited exquisite point tenderness at the designated location, particularly when tested for a positive Carnett's sign. In that case, lifting the feet and head off the table intensifies the sensitivity to local pressure and identifies abdominal wall tenderness as compared with visceral tenderness. The diagnosis of TrPs was then confirmed without mentioning how.

Patients received a fan-shaped injection of a mixture of 2 ml 0.5 percent bupivacaine, 3 ml 2 percent lidocaine, and 4 mg of betamethasone in the TrP using a 23-gauge needle. At the follow-up exam in seven days, a second injection was given if the first did not provide relief, with one or more subsequent weekly injections in some cases. Eventually 133 patients [95 percent] experienced no pain or mild pain following this treatment. Follow-up exams were done after three months. After one week, 68 percent of

patients reported no pain or pain much alleviated. Visual analog scores reduced from 7.6 pre treatment to 1.8 one week later [ $P < 0.001$ ]. At three-month follow up, 86.5 percent of patients had complete or nearly complete relief with an average visual analog scale score of 2.1, that is  $P < 0.001$  compared to pretreatment. These are also clinically very significant and long-lasting improvements.

The authors emphasized that all physicians examining patients with lower abdominal pain complaints for abdominal wall should look for TrPs and make sure they are effectively treated.

#### Comments

This is a clinically useful and informative multiple case report on lower abdominal pain and its management even though it rates poorly as scientific research of TrPs. I fully agree with the authors' conclusions.

It is unfortunate that the authors failed to identify what diagnostic criteria they used to confirm the presence of TrPs and that they had such a poor understanding of TrPs. The latter is no surprise considering that their references did not include one publication on the subject of TrPs, although that was the subject of the paper even if the title did not say so. Which abdominal wall muscles were being treated was not indicated. It is very doubtful if there was any advantage to injecting three medications, especially a corticosteroid that is contraindicated, when dry needling is known to be equally effective. The discussion of the nature of TrPs left much to be desired. There was no mention of eliciting a local twitch response when the needle encountered a TrP. However, one must be careful not to throw the baby out with the bathwater [DGS].

**Garcia-Leiva, JM, Hidalgo J, Rico-Villademoros F, Moreno V, Calandre EP: Effectiveness of Ropivacaine Trigger Points Inactivation in The Prophylactic Management of Patients With Severe Migraine. Pain Med 8(1): 65–70, 2007**

#### Summary

A PhD and four MDs from Granada, Spain, reported injecting myofascial trigger points

[TrPs] weekly in 52 patients who suffered migraine headaches with 10 mg of ropivacaine. In every patient, TrPs were identified by manual palpation of the scalp and neck by a trained expert in this field during a headache-free period with a finger pressure of not more than 4 kg. They reported examining the supraciliary arch, medial and anterior fibers of the temporalis muscle, parietal muscle, both the occipital and suboccipital areas, and the upper trapezius muscle. Every patient had TrPs with at least one TrP in the temporalis muscle. Eighty percent of the patients had at least one TrP in the suboccipital region. Forty-two percent of the patients had four TrPs, and one had as many as 13. In addition to TrPs, 9 patients had fibromyalgia syndrome [FMS], 10 had temporomandibular dysfunction, and one had mixed anxiety and depression syndrome.

Two patients with chronic migraine, multiple tender points, and generalized allodynia [probably FMS] withdrew because of unbearable pain with injections and no improvement. Sixty percent of patients were much or very much improved based on Clinical Global Impression [GGI] scores. Twenty-seven percent of the 30 patients with chronic migraine advanced to only episodic migraine. The patients with severe migraine improved from an average visual analog scale [VAS] reading of 7 to 4 [ $P = 0.0013$ ], moderately severe migraine improved slightly from 6.5 to only 6 VAS, and those with mild migraine got more severe attacks and increased VAS readings from 5 to 5.5. Thirty-two percent of patients reported pain during ropivacaine injections. Patients with generalized allodynia did poorly. Only one of these patients reached 50 percent reduction in attack frequency, none reported improvement in GGI scores, and only two reduced rescue medication. Thirty-two percent of patients found the ropivacaine injections painful and 42 percent complained of postinjection soreness.

The CGI scores indicated much more improvement than reduction in frequency of attacks. Migraine attacks were better tolerated after treatment, and the patients welcomed the reduced need for rescue medication and shorter attacks. The authors thought that the degree of central sensitization contributed to the severity of symptoms and that TrP injections are a valuable therapeutic tool in prophylaxis of migraine; however, they did not recommend it as first-line

treatment because of the demands injection treatment made on the patient. They recommended drug therapy instead, unless drugs were ineffective.

### Comments

This good-sized study of a clinical condition for which there are only a few other published peer reviewed articles is an important pioneering publication in this field (5–7). The finding that the more severe the migraine symptoms the more effective inactivation of TrPs was is a very important additional clinical guide. The authors applied only one injection procedure for this study, but in clinical practice, numerous other TrP treatments may be less demanding of patients' tolerance.

They concluded the inactivation of TrPs is a valuable procedure for prophylaxis of migraine and then contradicted themselves by saying drugs are a preferable way to go. Drugs have undesirable side effects, and there were no adverse reactions to the injections and less likelihood from manual therapy treatments. The basis for this conclusion is not clear, especially because other studies recommended inactivation of TrPs without reservations for these patients.

The lack of a control group in this study is largely covered by the fact that some patients greatly improved and others got worse, which eliminates placebo reactions as the cause for improvement. This is actually more valuable to clinic practice than a control group, but was serendipitous good luck in this case.

As a research study of TrPs, this paper leaves much to be desired. There is no complete description of the specific diagnostic criteria employed to confirm the identification of TrPs, but the paper as a whole confirms that for the most part that is what they were treating. The understanding of TrPs was hazy, which is not surprising because the only TrP references cited were clinical treatment studies and none dealt with the nature of TrPs, such as the 1999 edition of *The Trigger Point Manual* (8). The authors wisely emphasized the important role of central sensitization with a chronic pain input like this [DGS].

**Giamberardino MA, Tafuri E, Savini A, Fabrizio A, Affaitati G, Lerza R, Di Ianni L, Lapenna D, Mezzetti A: Contribution of Myofascial Trigger Points to Migraine Symptoms. *J Pain* 8(11): 869–878, 2007**

### **Summary**

Seventy-eight migraine patients with myofascial trigger points [TrPs] in the cervical muscles and referred pain consistent with frontal and temporal migraine sites were included in this study from Italy. The objective of the study was to compare the efficacy of TrP treatment with local anesthetic vs. no treatment in patients as compared with sensory assessment in normal subjects. The subjects were divided into two groups. Inclusion criteria for group 1 [N = 54] were an age range of 18 to 50 years, either sex, a history of migraine at least a year before the examination and diagnosed by a specialist using the 2004 criteria of the International Headache Society, a number of migraine attacks equal to or greater than six per month in the preceding two months, a negative history for any condition known to affect general pain sensitivity, the presence of active TrPs in the cervical region with referred pain into typical migraine pain areas, poor responsiveness to classic migraine treatments, and written consent. The subjects in this group had unilateral frontal or temporal migraine with TrPs in the sternocleidomastoid [N = 19], semispinalis cervicis [N = 23], or splenius cervicis [N = 12] muscles with referred pain patterns consistent with the migraine pain locations.

Subjects assigned to group 2 [N = 24] had the same inclusion criteria as well as an intolerance or allergy to local anesthetics. They also presented with TrPs in the sternocleidomastoid [N = 10], semispinalis cervicis [N = 8], or splenius cervicis [N = 6] muscles. Normal subjects [N = 20] had to have an age range of 18 to 50 years and either sex, a negative history for migraine and any cervicocranial pain, a negative history for any condition known to affect general pain sensitivity, a negative clinical examination for the presence of TrPs in the cervicocranial region and written informed consent to participate in the study.

Trigger points were identified using standardized criteria consistent with guidelines by Simons, Travell, and Simons (8). For subjects in

group 1, pain threshold measurements to electrical stimulation in skin, subcutis, and muscle in the TrPs and referred pain area were determined before the initial TrP infiltration with 0.5 mL of bupivacaine [5 mg/mL] and before each subsequent infiltration on the 3rd, 10th, 30th, and 60th day after the initial treatment. Only one TrP was injected in each subject following a standardized methodology. Patients were not told that the treatment could reduce their migraine pain. Subjects in group 2 did not receive any treatment. The researchers determined the number and maximal intensity of migraine attacks during a two-month period prior to the interventions and the number of times they had to take “rescue medication” consisting of 1000 mg paracetamol during the study. Normal subjects were evaluated in the same intervals as the subjects. Other potential complicating factors, such as the phase of the menstrual cycle in fertile women or possible cutaneous allodynia following a migraine episode, were considered in the study design. The researchers also included a second phase to control for a possible placebo effect. Twelve subjects, meeting the inclusion criteria for group 2, received injections outside TrP areas during a 30-day period with follow-up interventions scheduled at the 3rd, 10th, and 30th day after the initial injection.

As previously established in research by the main author and the late Dr. Vecchiet, the subjects in both groups presented with skin, subcutis, and muscle hyperalgesia at the beginning of this study (9,10). Only subjects in group 1, who were treated with TrP injections, showed a progressive reduction of tissue hyperalgesia, especially at the skin and subcutis level. At the same time, migraine symptoms decreased only in group 1. Subjects in the “placebo-control” group who received injections outside TrP areas did not show any significant improvements. The authors concluded that TrPs are strong sources or peripheral nociceptive input and cervical TrPs may contribute to migraine symptoms. Treatment of TrPs lowers the peripheral input from TrPs.

### **Comments**

This is a very well-designed study that offers strong support that TrPs can contribute to symptoms associated with migraine. Even though

only one TrP was treated, tissue hyperalgesia, migraine symptoms, and use of rescue medication was significantly. We welcome such excellent TrP research by Giamberardino and her colleagues. There should be no doubt anymore that TrPs are essential in the treatment of patients with migraines. This study joins a growing number of other studies confirming the role of TrPs in migraine headaches and the effectiveness of TrP therapy (5,6,11,12). As a side note, Travell discussed the relationship between TrPs and headaches already in 1967 (13)! In clinical practice, multiple TrPs in various muscles are treated along with other therapeutic measures, such as posture corrections, restoration of joint mobility and proprioception, and psychological management for depression, stress, anger, and anxiety. Dr. Giamberardino and colleagues are congratulated on designing and publishing one of the best studies to date on the subject of TrPs and migraine. Hopefully Dr. Giamberardino will consider extending the current research study to other pain syndromes, as we fully anticipate that similar correlations exist between TrPs and other pain syndromes, including low back and pelvic floor pain, shoulder and arm pain, among others [JD].

**Ga H, Koh H-J, Choi J-H, Kim CH:**  
*Intramuscular and Nerve Root Stimulation vs Lidocaine Injection of Trigger Points in Myofascial Pain Syndrome. J Rehabil Med*  
39: 374–378, 2007

### **Summary**

Forty-three subjects with myofascial trigger points [TrPs] in the upper trapezius muscle were included in this study from Korea. The subjects were randomly assigned to one of two groups: an intramuscular stimulation [IMS] group and a TrP injection [TPI] group. The subjects and the examiner were blinded to the group assignment. Exclusion criteria included previous treatment with either modality in the past six months; a history of neck or shoulder surgery within one year preceding the study; opioid medicine intake within one month prior to the study; a diagnosis of fibromyalgia, cervical radiculopathy, or myelopathy; severe cardiovascular or respiratory disease; allergies for drugs or injections;

cognitive deficits or communication problems, among others. Subjects in the TPI group were treated with 0.5 percent lidocaine injections using 0.2 ml per TrP into a taut band in the upper trapezius muscle “until all the TrPs were inactivated.” A 25-gauge, 38-mm long needle was used. Subjects in the IMS group also were treated in a similar fashion using a 60-mm long acupuncture needle with a 0.30-mm diameter. In addition, subjects in the IMS group were needled at the C3-5 level as described by Gunn ... (14). The authors referred to the paraspinal needling as “nerve root stimulation.” Following the intervention, all subjects were instructed to perform self-stretching exercises for the upper trapezius muscle three times per day until the next treatment. Follow-up treatments were scheduled one and two weeks later, although the authors also mentioned that outcome measures were determined on “days 0, 7, 14, and 28 just before treatment,” leaving it unclear whether subjects were treated three or four times. The results section suggests that all subjects were treated four times. Outcome measures included the visual analog scale [VAS], the Wong-Baker FACES pain scale, range of motion, pain pressure threshold using digital palpation, depression, postneedling soreness, hemorrhage, and dizziness.

Both groups showed significant improvements in the VAS and Wong-Baker Faces scales, although there were differences. For example, the TPI group did not show any improvement on the VAS between days 14 and 28 or on the Wong-Baker FACES between days 0–7 and 14–28 compared with the IMS group that showed improvements on all follow-up visits, except on the pressure threshold measures between days 0 and 7. The authors argued that the IMS group had better pain relief, based on reported inconsistencies in the VAS for pain scales and a preference for the FACES Pain scales. Depression scores improved only in the IMS group, which the authors hypothesized could be related to the greater time requirement to administer the IMS technique when compared with TrP injections. Local twitch responses were elicited in 81.4 percent of all treatment during the first treatments. Forty-two out of the 43 subjects [97.7 percent] had at least one local twitch response during the course of treatment. Both the IMS and TRI group improved in passive range of

motion. The IMS group achieved greater improvement in extension. There were no differences in posttreatment soreness between the two groups.

### Comments

To the best of this reviewer's knowledge, this is the first study that compares TrP injections with dry needling using acupuncture needles. Previous studies, which were referenced properly by the authors, compared TrP injections with dry needling using syringes, and it should come as no surprise that dry needling using a syringe caused more postneedling soreness than injections with lidocaine (15,16). This study confirms our clinical impression that dry needling does not cause more postneedling soreness when compared with injection therapy. It is not clear from the study whether the authors attempted to purposefully elicit local twitch responses when they inactivated TrPs. It appears that LTRs were a coincidental finding and not the focus of the needling procedures.

The authors maintained that they compared intramuscular stimulation described by Gunn with TrP injections described by Simons. As a certified IMS practitioner, this reviewer does not agree that the needling procedure used in this study represents Gunn's approach. Although the authors describe Gunn's ideas accurately, according to the quoted reference and this reviewer's education in the Gunn Approach to Chronic Pain, Gunn's IMS approach does not include inactivating peripheral TrPs (14). Therefore, it would have been more accurate if the authors had acknowledged that they compared TrP injections with peripheral TrP dry needling combined with paraspinal dry needling.

It is noteworthy that in spite of some differences, both injection therapy and dry needling were effective for several of the outcome measures, which brings up the question why injection therapy continues to be the leading choice of many physicians when treating patients with TrPs. Could it be that the existence of insurance codes for TrP injections, at least in the United States, would persuade physicians to use injections rather than dry needling, for which there are no specific codes? There is controversy whether TrP injection codes can be used when dry needling procedures are performed. In 2004,

the American Academy of Family Physicians advocated that the TrP injection codes can be used even when performing dry needling (<http://www.aafp.org/fpm/20041000/coding.html>): "the intent . . . is to identify the procedure of performing the trigger point injection, regardless of whether an injectable is supplied." Insurance companies have not uniformly followed the same guidelines [JD].

**Ga H, Choi J-H, Park C-H, Yoon H-Y: Dry Needling of Trigger Points With and Without Paraspinal Needling in Myofascial Pain Syndromes in Elderly Patients. *J Altern Compl Med* 13(6): 617-623, 2007.**

### Summary

This study is a variation of the previously reviewed paper that compared trigger point [TrP] injection therapy with combined peripheral TrP and paraspinal dry needling. The exclusion criteria, overall study design, and outcome measures were identical in both studies. In this study, the authors compared TrP dry needling without paraspinal needling to TrP dry needling with paraspinal needling. Forty subjects, ranging in age between 63 and 90 years, with TrPs in the upper trapezius muscles, were randomly assigned to either a dry needling group [N = 18] or to a dry needling group with additional paraspinal needling, which the authors referred to as the intramuscular stimulation [IMS] group [N = 22]. The authors equated TrP dry needling with paraspinal dry needling to Gunn's IMS techniques.

Peripheral TrPs were treated in the same fashion in both groups. Subjects were positioned in the prone position. The taut band was held in between the thumb and index finger and was needled using a 0.30 diameter, 60-mm length acupuncture needle fixed by a plunger-type needle holder. The needling continued until there were no further local twitch responses [LTR]. The IMS group was also needled in the multifidi muscles at the C3-5 levels, using what Gunn has described as the "grasping and winding up" method, which involves turning the needle after a "grasping" of the needle was perceived. The LTRs were observed in 80 percent of all subjects during the first treatments, with 97.5 percent of subjects demonstrating

at least one LTR during the entire course of treatment.

After one month, subjects in both groups showed significant improvements in the scores on the visual analog scale for pain, the Wong-Baker FACES pain scale, and pain pressure thresholds using digital palpation. The IMS group improved more continuously throughout the month. There was a borderline significant interaction between time and type of treatment in the FACES scores. The authors speculated that perhaps with a greater number of subjects, the differences would be greater. Depression scores improved only in the IMS group. All passive range of motion scores improved except cervical extension in the dry needling group. There were no differences in postneedling soreness. The authors concluded that dry needling of TrPs with paraspinal needling is a better method than dry needling of TrPs only.

### Comments

Compared to with TrP injection paper reviewed above, the authors used both the term IMS or intramuscular stimulation and the descriptive “dry needling of TrPs with paraspinal needling” interchangeably. Throughout the paper, they referred to the “dry needling of TrPs with paraspinal needling” as the IMS group. As summarized in the comment section of the preceding review, the term IMS is strongly associated with the work of Chan Gunn, as the authors mentioned several times. However, the IMS approach as Gunn described does not include the systematic inactivation of peripheral TrPs. In Gunn’s hypothesis, TrPs are always the result of neuropathic changes consistent with Cannon and Rosenblueth’s Law of Denervation, which maintains that the function and integrity of innervated structures depends upon the free flow of nerve impulses. Gunn speculated that needling the multifidi would facilitate the resolution of any myofascial dysfunction. Gunn does not promote needling peripheral TrPs and therefore, this study does not really compare IMS with peripheral needling. The descriptive “dry needling of TrPs with paraspinal needling” is the more appropriate term to use in this paper.

Regarding the outcomes, the authors found statistically significant changes in favor to the group that received “dry needling of TrPs with

paraspinal needling.” Nevertheless, after reviewing the data, it was noted that the changes were very small, although statistically significant. That greater numbers of subjects would confirm the current findings is not at all clear. The authors stated that “further studies with more subjects are needed for verification.” Until such studies have been completed, it suffices to conclude that both peripheral TrP needling and “dry needling of TrPs with paraspinal needling” are effective treatment modalities in the treatment of individuals with pain and dysfunction associated with TrPs. The authors are commended for starting this line of inquiry. There are not many papers in support of TrP dry needling and good research is very much needed. Both papers by Ga et al. demonstrate that dry needling is a valid modality for the treatment of TrPs [JD].

***Itoh K, Katsumi Y, Hirota S, and Kitakoji H: Randomised trial of trigger point acupuncture compared with other acupuncture for treatment of chronic neck pain. Complement Ther Med 15(3):172–179, 2007***

### Summary

Forty patients [29 women, 11 men; age range: 47 to 80 years] with nonradiating neck pain for more than six months and a normal neurological examination were included in this study from Japan comparing standard acupuncture, trigger point [TrP] acupuncture, non-TrP needling, and sham acupuncture. The subjects were randomly assigned to a group. All subjects received two phases of treatment of three weeks each, for a total of six 30-minute treatments, once per week. Outcome measures included pain intensity measured with a visual analog scale [VAS] and pain disability measured with the Neck Disability Index [NDI]. An independent and blinded examiner performed the outcome measures.

Subjects assigned to the standard acupuncture group were treated at acupuncture points GB 20 and 21, BL 10 and 11, S12 and 13, TE 5, LI 4 and SI 3. The needle was inserted and moved back and forth until the subjects felt dull pain or the acupuncture sensation referred to as “de qi,” at which point the needle was left in place for 10 more minutes. Subjects in the trigger

point acupuncture group were examined for TrPs in the splenius capitis, trapezius, sternocleidomastoid, scalenes, levator scapulae, paraspinal, and suboccipital muscles. An acupuncture needle was inserted into the skin overlying a TrP and advanced to 20 mm into the muscle. A local twitch response was elicited and the needle was left in place for 10 additional minutes. Subjects in the TrP group received a mean of 2.3 insertions. Subjects in the nontrigger point group were treated at nontender points 50 mm away from TrPs for a mean of 2.4 needle insertions. Subjects in the sham acupuncture group were treated over TrPs using the same criteria as in the TrP group. The tips of the acupuncture needles used in the sham group were cut off and smoothed to prevent penetration of the skin. After 10 minutes, a simulation of needle extraction was performed. All subjects were asked to describe the needle insertion to determine the efficacy of the blinding technique used in this study.

The results were overwhelmingly positive for the TrP group after three weeks and nine weeks both for the pain intensity and pain disability. The VAS scores reduced from 67 to 11 for the TrP group but did not change significantly for the other groups [ $P < 0.01$ ]. Pain disability scores on the NDI reduced from 13 to 3.1 for the TrP group and again did not change significantly for the other groups [ $P < 0.01$ ]. The blinding technique was found to be reliable. The authors concluded that treatment of TrPs has a better analgesic effect than treatment of non-TrPs or acupuncture points, presumably because of polymodal-type nociceptor activation.

### Comments

This paper from Japan is the second study by this research group comparing various needling approaches (17). The authors express a good understanding of TrPs and the requirements for effective dry needling techniques. Direct treatment of TrPs was far superior to treatment of acupuncture points or non-TrPs even though only one local twitch response was elicited per TrP. This study supports the use of TrP dry needling in the treatment of chronic neck pain. The authors used the term TrP acupuncture, which may be an appropriate term for acupuncture practitioners treating TrPs. When nonacupuncture practitioners, such as physical therapists, treat TrPs

with acupuncture needles, this reviewer prefers the term dry needling [JD].

**Srbely JZ, Dickey JP: Randomized Controlled Study of The Antinociceptive Effect of Ultrasound on Trigger Point Sensitivity: Novel Applications in Myofascial Therapy? Clin Rehabil 21: 411–417, 2007**

### Summary

After a brief introduction discussing the prevalence of musculoskeletal pain and the nature of myofascial trigger points [TrPs], the authors reviewed the few papers that have been published about the effects of ultrasound on TrPs. The objective of this study from Canada was to determine whether ultrasound can modulate the sensitivity of TrPs. Forty-four subjects [22 males and 22 females, mean age 48 years, age range of 28 to 65 years] with an active TrP in the right trapezius muscle were selected from a rehabilitation clinic. The criteria used to identify a TrP included a well-defined, palpable tender nodule within a taut band with deep, achy, diffuse, and poorly localized discomfort radiating into the lateral aspect of the ipsilateral arm after 10 to 20 seconds of prolonged pressure. Subjects with a history of recent trauma to the neck or shoulder, any form of medication, or subjects with a preexisting neuromuscular condition were excluded from the study. The primary outcome measure was the pain pressure threshold measured by applying direct pressure over a TrP using a dynamometer. Subjects in the experimental group received a 5-minute ultrasound treatment over the trapezius TrP with a 1 W/cm<sup>2</sup>, 1 MHz continuous wave form, compared with a 5-minute 0.1 W/cm<sup>2</sup>, 1 MHz continuous wave form for the control group. The same person who administered the treatment measured pain pressure thresholds immediately following the intervention.

Subjects in the experimental group demonstrated a significant 44.1 percent increase in their pain pressure thresholds compared with 1.4 percent of the control group [ $P < 0.05$ ]. No differences were observed between male and female subjects. In the discussion section, the authors emphasize that in the clinical setting ultrasound may offer an alternative or complement to

other treatments, due to its ability to reduce TrP sensitivity.

### **Comments**

The authors acknowledged that the lack of a blinded observer is a major limitation of this study. Yet, the short term decrease in sensitivity may be useful in preparing patients for other, potentially more painful therapies, such as manual TrP release or even TrP dry needling. The authors devoted a few paragraphs on the possible mechanisms of ultrasound analgesia, quoting a recent paper by Hsieh, who established that ultrasound may modify the number of neuronal nitric oxide synthase-like neurons in the dorsal horn in rodents, thereby reducing pain via direct modulation of central pain pathways. There is no evidence that ultrasound applied to TrPs would have any long-term effect, a topic which the authors aim to address in future studies [JD].

**Zaralidou AT, Amaniti EN, Maidatsi PG, Gorgias NK, Vasilakos DF: Comparison Between Newer Local Anesthetics For Myofascial Pain Syndrome Management. *Methods Find Exp Clin Pharmacol* 29(5): 353–357, 2007**

### **Summary**

In this study from Greece, 68 patients with myofascial pain were randomly assigned to one of two groups. Subjects received three to five trigger point [TrP] injections with either 0.25 percent levobupivacaine or with 0.25 percent ropivacaine. Myofascial pain was defined as the presence of musculoskeletal pain, localized tender points, referred pain without symptoms of fatigue, paresthesias, sensation of swelling with and without the coexistence of headaches, poor sleep, or irritable bowel syndrome. Patients did not have any analgesic medication during the course of the study. The clinician administering the injections and the patients were blinded to the type of local anesthetic. Outcome measures included a numerical rating scale for pain. Measurements were obtained prior to any injection, during, immediately after, and 15 minutes after each TrP injection by an independent and blinded investigator. Following the intervention, subjects were contacted by telephone every other

day by a research fellow not otherwise involved in the study and were asked to rate their pain. The period of time until the pain returned to the pre-injection value was used as an outcome measure. The researchers did not find any statistically significant differences in between the two groups. Levobupivacaine had slightly lower pain ratings than ropivacaine. The authors concluded that both anesthetics are equally effective, but because of its lower pain rating, levobupivacaine might be preferable.

### **Comments**

This comparison study of the effects of trigger point injections with 0.25 percent levobupivacaine and 0.25 percent ropivacaine did not find any significant differences between the two substances for pain during injection, efficacy of the treatment, and duration of pain relief. The substances were equally effective. The diagnostic criteria for the identification of TrP used in this paper are poorly defined. The authors use the terms tender point and TrP but make no mention of palpating for taut bands. It is not clear whether they made a distinction between active and latent TrPs [JD].

## **REVIEWS & COMMENTS**

**Bennett R: Myofascial Pain Syndromes and Their Evaluation. *Best Pract Res Clin Rheumatol* 21(3): 427–445, 2007**

### **Summary**

Throughout this paper, Bennett repeatedly focused on the huge discrepancy between the high prevalence and importance of myofascial trigger points [TrPs] compared with the lack of attention many physicians pay to them. He begins with definitions and follows with a list of eight common musculoskeletal complaints that are usually assigned other diagnoses but are largely caused by TrPs. The list includes tension headaches, low back pain, neck pain, temporomandibular pain, forearm and hand pain, postural pain, and pelvic/urogenital pain problems. Summarizing the history and physical examination, he emphasized the important clinical difference between active and latent TrPs, and the critical importance of adequate training and experience needed to

confidently delineate TrPs. He attributed the common finding of muscle weakness associated with TrPs to disuse or pain inhibition. While emphasizing pain aspects of the examination, he noted the importance of finding a tender spot in a palpable taut band when it is within reach. Discussing reliability of the diagnosis, he identified the studies that established the importance of training and practice and the dire need for a set of validated diagnostic criteria.

Muscle pain experiments have demonstrated the importance of central sensitization to the pain of TrPs. The current understanding of the histopathology of TrPs was well summarized. The scope of neurophysiology was well covered but was weak in the understanding and interpretation of electrodiagnostic studies. The section on the biochemical milieu included a full description of the 2005 study by Shah et al. with illustrations (18).

The section on common clinical syndromes of myofascial pain included common diagnoses that in fact are due largely to TrPs for head and jaw pain with pain illustrations, neck and shoulder pain, low back pain with illustrations, hip pain, pelvic pain, upper limb pain, lower limb pain, and chest and abdominal pain. The section on treatment included postural and ergonomic perpetuating factors, stretching, strengthening of weakness due to pain inhibition. Consideration of TrP injections noted the value of dry needling and medications based on the author's clinical experience. He wisely emphasized the fact that anxiety and depression need to be treated as a result of persistent pain and are usually not the cause of it.

### Comments

Robert Bennett, MD is a rheumatologist in Portland, Oregon who, to our knowledge, has been for many years one of the first rheumatologists to fully appreciate the importance of TrPs for the fibromyalgia syndrome. He is recognized among rheumatologists as a leading research investigator of fibromyalgia. This paper is one of the best up-to-date reviews, summaries, and literature citations of TrPs that has been published lately. It is a noteworthy milestone of progress toward mainstream medical recognition of TrPs that such a solid member of the rheumatology profession should author this outstanding paper on TrPs.

Recently, a series of papers have greatly enhanced our understanding of the relationship between headaches and TrPs. Dr. Fernández-de-las-Peñas of Spain and colleagues have published controlled studies of prevalence of active or latent TrPs that are strongly associated with restricted mouth opening (19), tension-type headache [TTH] from the superior oblique extraocular muscle (20), mechanical neck pain (21,22), TTH from suboccipital muscles (23), and TTH from the upper trapezius (24). In addition, Giamberardino et al. of Italy did a controlled study of results of treatment of migraine headaches that indicate TrPs commonly act as triggers of symptoms (7).

The serious lack of validated diagnostic criteria is currently under research investigation by a Spanish physical therapist. The common finding of muscle weakness associated with TrPs is likely more frequently caused by inhibition from latent TrPs in the same or neighboring muscles than to disuse or pain inhibition. This is based on extensive surface electromyographic studies by a competent physical therapist but has been published only in book chapters and not in peer-reviewed literature (25,26). Another motor disturbance from latent TrPs, loss of coordination, has been published as a reviewed article (27).

With regard to pathology, a new look at past biopsy findings suggests that TrPs are essentially a myopathy. Bennett's review emphasizes the importance of studies to explore genetic factors. The findings and results of electrodiagnostic examination of TrPs are well described with an understanding of the integrated hypothesis and shows why the spontaneous electrical activity and endplate potentials are abnormal (28). *The Trigger Point Manual* (8) fully explains why muscle spindles cannot be the source of these potentials. It is hard to see how TrPs could be considered a focal dystonia. A dystonia produces repetitive involuntary twisting movements. A focal dystonia describes "a variety of musculoskeletal problems that are particularly applied to the fine muscle problems encountered by professional musicians" (29,30). This condition lacks the spot tenderness in a palpable taut band that is characteristic of TrPs.

The section on Common Clinical Syndromes leaves no doubt that TrPs are a pervasive and widespread source of musculoskeletal pain. The fact that the usual treatment for muscle weakness focuses only on strengthening makes the fact

that the weakness is usually caused by inhibition from a latent TrP an important issue. Starting with inactivation of the latent TrP cause of the weakness avoids the usual mistake of starting strength training first, thus resulting in teaching the patient to use substitute muscles instead of the inhibited muscle, which unfortunately makes muscle function more abnormal [DGS].

***Staud R: Future perspectives: Pathogenesis of Chronic Muscle Pain. Best Pract Res Clin Rheumatol 21(3): 581–596, 2007.***

### **Summary**

This scholarly review by a rheumatologist in Gainesville, Florida, describes in detail his understanding of myofascial trigger points [TrPs] and fibromyalgia syndrome [FMS]. It emphasizes what we don't know as much as we think we know. The author begins by wondering if abnormal input from deep nociceptors is essential for the development and maintenance of FMS symptoms.

His review of TrPs summarized clinical characteristics, but defined active TrPs as responding to needle insertion with a local twitch response, and latent TrPs as not associated with either spontaneous or referred pain. Under pathogenesis, the author summarized and effectively integrated throughout this paper the seminal paper of Shah et al. (18). Staud was unsure of the etiology of TrPs but presented the essentials of the integrated hypothesis, quoting a number of studies that reinforce that hypothesis.

The review of FMS started with the 1990 American College of Rheumatology diagnostic criteria. With clear insight, Staud characterized it as a syndrome with no single specific feature that represents a symptom complex of self-reported or elicited findings that appear to depend on nociceptive input from deep tissues, particularly muscle. The author specifically lists and discusses in detail the response to stress events that alter neuroendocrine and autonomic nervous systems' functions, hyporeaction of the hypothalamic-pituitary-adrenal axis to stress, and the direct effects of the stress.

The source of the tenderness of tender points appears to be enigmatic to this author. However, he never mentions TrPs as a factor from this FMS point of view in spite of the fact that most tender

points are in muscles at locations that are common TrP sites—facts that are well documented in both sets of literature (31). One would expect at least latent TrPs to frequently be present at those sites. Interestingly, the author notes that patients characteristically do not complain of total body pain, but of specific regional pains like neck, temporomandibular, and back pain, and of headache. Each of these pain areas has its characteristic TrP cause. Staud notes the progression of persistence of these regional pains, especially whiplash injury, to FMS.

The author's review of the pathology of FMS is confusing because he often overlooks the fact that FMS research literature is highly contaminated by lack of appreciation of TrPs and by terminological confusion. It is important to remember that the most common site of TrPs is the upper trapezius muscle, the muscle that is usually biopsied for FMS studies. Similarly, it can be misleading to assume that microcirculation studies on the trapezius muscle in subjects with the diagnosis of myalgia is caused by FMS rather than TrPs. Staud presented a knowledgeable review of the mechanisms of hyperalgesia in FMS.

### **Comments**

By presenting so much interest and understanding of TrPs coming from a rheumatologist not well known in the field of myofascial pain in a prestigious rheumatology journal, this paper is a breath of fresh air. The author is heartily congratulated. He is a true scholar and presented an up-to-date summary of current knowledge and understanding. This is illustrated in his review of the mechanisms of hyperalgesia in FMS. Also, he characterized FMS as a symptom complex with no specific diagnostic feature that stems from dysfunctions of multiple organ systems and appears to depend on nociceptive input from deep tissues. This looks to me like a harbinger of the growing understanding of FMS.

The problems I encountered in this paper are endemic among most rheumatologists and also many others, but nevertheless are worthy of note. We avoid using the term *myofascial pain syndrome* because there is accumulating evidence that it is a disease not a syndrome and simply identify it as myofascial pain, or more specifically TrPs (30).

Active TrPs are generally recognized as causing a clinical pain complaint that is reproduced by digital pressure on the TrP. Latent TrPs do not cause a clinical pain complaint but on examination can produce all the pain symptoms characteristic of active TrPs. This distinction is clinically very important, and we need to reach agreement regarding these two definitions. The definitions the author uses differ substantially from the usage of Shah et al. and our publications (8,18).

The lack of consideration of TrPs in FMS research has resulted in a whole body of literature highly contaminated by unrecognized TrP effects that renders it not only incomplete but also sometimes seriously misleading. This stems from the early erroneous report, by a rheumatologist unskilled at finding TrPs, that TrPs are rarely found in patients with FMS, which has become gospel truth to many rheumatologists. Unfortunately, to date, there has been no competent study published to correct this misinformation.

The other serious source of confusion is the multiplicity of names that have been used to describe patients with symptoms caused by TrPs going back to muscular rheumatism, myogelosis, and fibrositis that metamorphosed to FMS (32). Staud quoted two papers as sources of biopsy information on FMS, one of which attributed latent TrP pathology to FMS, and he attributed the findings in myogelosis to FMS, but the clinical symptoms of myogelosis are much more specific to TrPs than FMS (33,34).

Readers interested in this review of TrPs by a rheumatologist will not want to miss the paper by Robert Bennett reviewed above in this column [DGS].

**Yunus MB: *Fibromyalgia and Overlapping Disorders: The Unifying Concept of Central Sensitivity Syndromes. Semin Arthritis Rheum* 36(6): 339–356, 2007.**

### Summary

This rheumatologist author from Peoria, Illinois, has been a leader in the field of fibromyalgia syndrome [FMS] for many years. His thesis is that lack of a demonstrated characteristic pathology and presence of central sensitization is common to the symptoms of FMS, irritable bowel syndrome, headaches, and chronic fatigue

syndrome. This justifies considering this group of diagnoses as a syndrome that serves as an umbrella syndrome. He lists 13 diagnoses that fit under this umbrella and includes myofascial pain syndrome as one of them.

He very seriously questions and unequivocally rejects the validity of the current construct of what he calls myofascial pain syndrome and uses the term *regional soft-tissue pain syndrome* as an equivalent. The author's terminology identifies this disease as a regional pain condition with tender points in the absence of structural pathology. This issue is considered under the comments following this summary.

The erudite summary of the current understanding of central sensitization with as many as 237 literature references proceeds to a detailed analysis of how it applies to FMS, chronic fatigue syndrome, irritable bowel syndrome, tension type headache, migraine, temporomandibular disorders, myofascial pain syndrome, restless legs syndrome, multiple channel sensitivity, primary dysmenorrhea, interstitial cystitis, and traumatic stress disorder. Because it is solidly established that any sustained pain input produces central sensitization, the only specific feature common to this listing of diagnoses is lack of pathology that satisfies the author. We differ with the author's opinion on four of the items, which will be covered in the Comments section. The author proceeds to list factors that may trigger or contribute to central sensitization, a list that contains no surprises, but reviews thoroughly the well-established literature.

### Comments

I fully agree with the author that the time has come to find a new definition and understanding of FMS. His suggestion is headed in the same direction as the one Staud proposed that is also reviewed in this column. The search for the cause of FMS has been futile. Both authors agree that FMS also has critically important neuroendocrine aberrations, which is the issue that Staud emphasized. The concept that FMS is a syndrome caused by many interacting organ dysfunctions is the approach that looks most promising to many clinicians familiar with FMS. The importance of central sensitization to the three conditions that Yunus addresses is indisputable and is also a critically component of chronic trigger points [TrPs].

The position that myofascial pain syndrome has no pathological basis is untenable if one looks at three reports of muscle biopsies done on patients with myogelosis (33,35,36). Myogelosis has the same essential diagnostic criteria as TrPs (37,38). These papers demonstrate that TrPs have muscle pathology fully consistent with, and explanatory of, the clinical picture of TrPs. We prefer the term myofascial trigger points [TrPs] instead of myofascial pain syndrome because the diagnosis of TrPs fully qualifies for the dictionary definition of a disease rather than a syndrome (30). When one recognizes this fact, then conditions in which the pain component is largely associated or caused by TrPs no longer fit under the author's umbrella syndrome because they do now have an identifiable pathological foundation. In addition to TrPs, this consideration includes his listings of tension type headache, migraine, temporomandibular dysfunction, and interstitial cystitis.

A recent series of well-designed papers established TrPs as a major factor in tension type headache (20,23,24,39). Several of them emphasize the important role of central sensitization that enhances the basic TrP problem. Two similar papers established the close association of migraine with TrPs (5,6) and another identified the TrPs as a significant trigger mechanism by effective treatment of them (7).

One extensive paper by a dentist identified how frequently which TrPs reproduced the pain pattern of the temporomandibular-dysfunction patients for all of the masticatory muscles including some neck muscles (40). Members of the avant-garde Tufts Orofacial Pain Society at Tufts University in Boston, Massachusetts, are among the increasing number of dentists tuned in to TrPs and they told me [while I was there on 8 September 2007 to receive an award for my pioneering in the field of TrPs] that well over half of the many temporomandibular dysfunction patients that they see are there because of their TrPs.

Interstitial cystitis is one of a number of enigmatic pelvic pain complaints for which there are now credible clinical research papers that identify TrPs as the chief culprit (41). Other previously enigmatic pelvic pain conditions include female pelvic pains and nonbacterial prostatitis (42–44).

In addition, poor muscle coordination was clearly demonstrated in a well-controlled study

to be due to TrPs, a conclusion further substantiated in a PhD thesis on the subject (27). Epicondylitis [tennis elbow] has now been well reported as closely associated with TrPs (4). It is only a matter of time until TrPs will also be identified as the culprit source of common enigmatic musculoskeletal complaints such as low back pain and frozen shoulder by research investigators as well as clinicians. Trigger points are being accepted by mainstream medicine in many other countries. *The Trigger Point Manual* has now been translated into eleven (11) foreign languages including German, Spanish, French, Italian, Russian, Japanese, Chinese, and Korean.

In summary, it is not clear to this reviewer whether the author's proposed syndrome serves any useful purpose and whether his refusal to recognize TrPs for what they are is at all helpful to the medical community and to their patients [DGS].

***Chaitow L: Chronic Pelvic Pain: Pelvic Floor Problems, Sacro-iliac Dysfunction and The Trigger Point Connection. J Bodywork Movement Ther 11: 327–339, 2007***

### **Summary**

After presenting pertinent epidemiological data and definitions, illustrating how common various pelvic floor dysfunctions are, Chaitow provides a succinct review of several pelvic dysfunction studies where myofascial trigger points [TrPs] played a significant role in the etiology or maintenance of the problem. He discusses several controversies in the literature, such as whether the muscle tone of dysfunctional pelvic floor muscles is increased or decreased. Citing recent research, Chaitow reviews established connections between breathing dysfunction, pelvic floor dysfunction, and sacroiliac stability. The role of TrPs is emphasized especially in cases where muscle tone is inadequate to provide functional support for urethral and sacroiliac stability. Chaitow suggests that the development of TrPs may be a physiological response to restore muscle tone in damaged, dysfunctional, or denervated tissues. He concludes that there is much evidence of intricate links between pelvic floor muscle dysfunction and lumbo-pelvic or sacroiliac dysfunction without necessarily knowing the etiological

relationships. He recommends including manual treatment methods, including Thiele massage, TrP inactivation, dry needling, biofeedback, and relaxation or toning of the pelvic floor muscles. Manual treatments need to be combined with correcting postural and breathing pattern disorders and normalizing joint and soft tissue imbalances.

### Comments

Too often, clinicians and researchers focus on one particular aspect of musculoskeletal pain and dysfunction, including pelvic floor dysfunction. For some, the main focus may be TrPs, while for others sacroiliac dysfunction or motor planning may get the overriding emphasis. Chaitow has synthesized many current insights into pelvic floor dysfunction into one of the most comprehensive reviews on the topic. The paper illustrates nicely that any one approach is always limited and that patients need to be approached from a broad clinical perspective. During the recent 6th World Congress on Low Back and Pelvic Pain in November 2007 in Barcelona, Spain, Chaitow moderated a panel of myofascial experts, and the TrP concepts were introduced to an audience that previously has been more concerned about sacroiliac dysfunction. The article is well referenced and offers plenty opportunity to study the topic of pelvic floor dysfunction in more detail [JD].

**Fernández-de-las-Peñas C, Simons DG, Cuadrado ML, Pareja JA: The role of myofascial trigger points in musculoskeletal pain syndromes of the head and neck. *Current Headache Pain Reports* 11: 365–372, 2007**

### Summary

This review article discusses the scientific evidence that myofascial trigger points [TRPs] play a role in common disorders of the head and neck, including migraine and tension-type headaches, whiplash-associated disorders, and mechanical neck pain. After a brief introduction with definitions of TrPs and their clinical presentation, the paper reviews the literature and summarizes the possible mechanisms underlying the correlations between TrPs and pain in the head and neck region.

### Comments

Anyone interested in getting a quick and comprehensive review of the TrP literature relevant for head and neck pain should consider reading this paper. It is an excellent summary not only of the authors' extensive contributions to the literature but also of many other relevant studies, papers, case reports, and chapters. The primary author is a PhD-level Spanish physical therapist. The other three coauthors are physicians from Spain and the United States [JD].

**Rocha CAAB, Sanchez TG: Myofascial Trigger Points: Another Way of Modulating Tinnitus. *Progress Brain Res* 166(18): 209–214, 2007**

### Summary

In this paper from Brazil, the authors established a strong correlation between tinnitus and myofascial trigger points [TrPs] particularly in the masseter, splenius capitis, sternocleidomastoid, and temporalis muscles. The authors used the criteria for TrPs Simons, Travell, and Simons suggested (8). More than 72 percent of 94 patients with tinnitus had relevant TrPs compared with 36 percent in a control group of individuals without tinnitus. Compression of the TrP modulated the symptoms of tinnitus in 55.9 percent of subjects. In more than 65 percent of these subjects, the tinnitus was aggravated by stimulation of TrPs, while in others stimulation of the involved TrP completely resolved the symptoms. Of particular interest is the observation that compression of both active and latent TrPs modulated tinnitus. The paper includes a brief discussion about the similarities between tinnitus and pain.

### Comments

This review paper, which was published as a chapter in the periodical *Progress in Brain Research*, is an important summary of the research of the primary author who previously established that individuals with tinnitus are more likely to complain of chronic pain in the head, neck, and shoulder girdle. The observation that tinnitus can be directly linked to TrPs has many implications for the clinical practice of primary

care physicians, internists, dentists, and ear-nose-and-throat physicians. Unfortunately, few physicians in these disciplines have been trained to recognize the signs of TrPs and to examine patients for the presence of relevant TrPs. This study confirms other studies on the subject of tinnitus and TrPs (45). The authors misquoted the Simons, Travell, and Simons reference [JD].

### BRIEF REPORTS

**Botwin KP, Patel BC: Electromyographically Guided Trigger Point Injections in The Cervicothoracic Musculature of Obese Patients: A New and Unreported Technique. Pain Physician 10: 753–756, 2007.**

This report from two physiatrists from Florida describes a previously unreported technique of trigger point [TrP] injections in obese patients. After a brief description of myofascial pain and TrPs, the authors described an electromyography-guided injection technique, which assures the clinician that the needle tip is placed in muscle tissue and not in adipose tissue or in lung tissue. The authors mentioned that electromyography-guided botulinum toxin injections have been described previously. Palpation of TrPs can be difficult in obese patients. The described technique offers no assurance, however, that the needle is placed directly in the TrP [JD].

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