Myofascial Pain Syndrome–
Trigger Points

Jan Dommerholt
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INTRODUCTION

Readers who are seriously interested in the promising potential of electromyographic detection of endplate noise as a gold standard for identifying TrPs and its likely limitations should be sure to consider the comments on and compare the papers by Couppe et al. and by Kuan et al. that are reviewed in this column. Those interested in writing a first-class paper on clinical research on TrPs should be sure to ruminate on the paper by Fernandez et al. For an example of outstanding research with immediate clinical applications, consider the paper by Saggini et al. about differentiating two types of heel pain. Several review articles, a case study, epidemiology studies, and a study of a new superficial dry needling approach complete this review. Contributions originated in a wide variety of countries, including Brazil, China, Denmark, Italy, Singapore, Spain, Taiwan, and the Unites States. As usual, each article review indicates whether it is prepared by Dommerholt [JD] or Simons [DGS].

RESEARCH STUDIES

Couppe C, Torelli P, Fuglasang-Frederiksen A, Andersen KV, Jensen R: Myofascial trigger points are very prevalent in patients with chronic tension-type headache; a double-blinded controlled study. Clin J Pain 23(1): 23-27, 2007

Summary

This double-blind, controlled study by a physical therapist and three doctors in Denmark reported on 20 patients with chronic tension-type headache [CTTH] and 20 controls primarily to determine if myofascial trigger point [TrP] palpation can distinguish patients with CTTH from controls. The TrPs were clearly identified by an exquisitely tender spot in a taut band which responded to mechanical stimulation with a local twitch response and were identified as active when palpation reproduced at least some of the patient's pain as headache, distinguishing it from a latent TrP. They also examined TrP sites and control points, non-TrP sites, using needle electromyography [EMG] for the presence or absence of spontaneous electrical activity [SEA], consisting of endplate noise and endplate spikes. Apparently the authors used only one channel of information without a second channel sampling a nearby control site.

The authors reported a high prevalence of TrPs in patients compared to controls. The presence of TrPs by manual examination distinguished the two groups with a high degree of sensitivity [85 percent] and specificity [70 percent] for TrPs. Eliciting a local twitch response or the presence of a taut band alone was not useful for identifying active TrPs. They found that

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Journal of Musculoskeletal Pain, Vol. 15(4) 2007
Available online at http://jmp.haworthpress.com

doi:10.1300/J094v15n04_10

TrPs are tender, which emphasizes their importance as part of the definition.

Comments

The authors are to be complimented on the rigor of their experimental design and their complete description of the diagnostic criteria used to identify TrPs. Their conclusion confirms the noteworthy value of including the evaluation of patients for TrPs who have CTTH, as also recently reported by others (1-5).

However, it also has some surprising, enigmatic, and possibly misleading results. The observation that six of the control group had false positive findings of active TrPs raises some questions, when two of the group experienced tension-type headaches and all of those subjects were very likely to have latent TrPs bordering on being active. The determination of active versus latent TrPs is quite sensitive to the palpation pressure applied to conduct the test and that procedure is quite variable, especially when tested by different examiners, which must have been the case in this study, or determined by post-test patient recollection.

Blinding is generally considered a virtue in quality research studies and is very valuable for eliminating examiner bias or bias in subjective observations. This study was thoroughly blinded, so thoroughly that it may have degraded the quality of the study. The authors did not report the relative prevalence of active and latent TrPs in their subjects, and blinded the examiner to the one diagnostic feature that distinguishes active from latent TrPs, the recognition of elicited referred pain as familiar. The clinical importance of making this distinction is becoming more apparent for a number of reasons and many of the more recent papers on this subject of TrPs and CTTH report that important information.

Also, the blinding of the person doing the EMG examination for SEA eliminates the ability to position the needle using palpation of the TrP nodule as the guide for needle placement. In the experience and reports of our team after an initial leaning period, the team practically never examined for SEA in TrP either active or latent in humans (6) or trigger spots in rabbits (7), that we failed to find unequivocal SEA [sometimes only endplate noise without spikes, especially in latent ones]. Palpating the site of needle penetration was essential for that success. This could help to account for the discrepancy between the findings reported here and previous literature.

Noteworthy is the fact that only one channel with one needle sampling of the muscle was employed in this study. The same first author previously reported a contrary finding (8) and made a point of the fact that a second control needle close the examining needle was placed nearby to confirm the absence of voluntary EMG activity which can look exactly like endplate spikes when the needle is within several microns of the endplate, where it needs to be to record SEA. That second channel also permits much more reliable and sensitive distinction between SEA and background noise that is always present. Results of records made without it are not as reliable. The coauthor examining for SEA was different in the two studies, which could possibly be a factor.

This is not a trivial issue, because there are already five scientific papers in the literature that reported contrary results. Two have been noted (6,8), two others used SEA as a gold standard to establish the diagnosis of TrPs (9,10), and the fifth was designed to prove that SEA is not restricted to TrPs, and failed (11). The importance of this issue is that SEA is becoming a promising prospect for serving as an objective gold-standard for confirming the clinical diagnosis of TrPs in research studies [DGS].

Saggini R, Bellomo RG, Affaitati G, Lapenna D, Giamberardino MA: Sensory and biomechanical characterization of two painful syndromes in the heel. J Pain 8(3): 215-222, 2007

Summary

This Italian study compared the characteristics of myofascial pain syndrome [MPS] of the abductor hallucis muscle with entrapment syndrome of the abductor digiti quinti in 33 patients with unilateral heel pain. The article starts with a brief review of pertinent anatomy. Because the nerve to the abductor digiti quinti [also known as abductor digiti minimus] runs underneath the fascia of the abductor hallucis, it

is clinically difficult to differentiate between pain due to an entrapment of the nerve at the edge of the deep fascia of abductor hallucis and pain due to MPS of the abductor hallucis.

Inclusion criteria were age range between 25 and 65 years; no professional sports activity; unilateral heel pain with an onset of more than 30 days and a duration of less than 120 days; absence of pathologic systemic condition; absence of latent myofascial trigger points [TrPs] in the soleus, peroneus longus and brevis muscles; and absence of diabetes. The study included 20 asymptomatic subjects without any past or current painful symptoms of the feet. The symptomatic subjects were divided into two groups. The entrapment group had sharp, electric shock-like pain, appearing in bursts of 60/90 seconds and triggered by the standing position. The myofascial group had tensive, cramp-like pain exacerbated by walking. Pain was perceived in the medial calcaneal border in both groups. The patients underwent multiple examinations, including tests for hypersensitivity, pressure pain, electroneurographic examination of the posterior tibial nerve, and evaluation of the ground reaction forces using a force platform. The pressure pain thresholds were measured at the site where the nerve of the abductor digiti quinti is most superficial and at the most common location of TrPs in the abductor hallucis. The control subjects had the same tests, but only ten of the control subjects had the electroneurography examination. The examiners were blinded and were not aware of which subjects were symptomatic.

Using these sophisticated sensory and biomechanical measurements, the researchers were able to determine several differences between the two diagnoses. The entrapment patients had exquisite hyperalgesia at the medial aspect of the calcaneal border, whereas the myofascial patients had pain at the medial process of the calcaneal tuberosity. The biomechanical analysis revealed that the entrapment patients had a reduction in vertical forces only at the contact phase. The MPS patients had a reduction in forces throughout the entire gait cycle. The authors recommended that clinicians differentiate between the two likely painful areas and evaluate the onset and nature of pain during gait. In case of a nerve entrapment, patients are more likely to have immediate sharp contact pain at heel strike. In case of MPS, patients are more likely to have a cramp-like pain that increases with walking.

Comments

This study is an excellent example of basic research with significant clinical implications. The authors designed a very well controlled study of the sensory and biomechanical characteristics of two distinct pain syndromes and were able to interpret their findings back to the clinic. They realized that such an extensive test battery is not available and not practical when seeing patients. The clinical guidelines are valuable pearls that will help clinicians differentiate between entrapment pain and myofascial pain, which in turn will direct the most appropriate treatment considerations [JD].

Fernandez C, Alonso-Blanco C, Miangolarra JC: Myofascial trigger points in subjects presenting with mechanical neck pain: A blinded, controlled study. Man Ther 12(1): 29-33, 2007.

Summary

A physical therapist, occupational therapist, and a physiatrist in Spain examined 20 patients with mechanical neck pain, and 20 healthy controls for myofascial trigger points [TrPs] bilaterally in the upper trapezius, sternocleidomastoid, levator scapulae, and suboccipital muscles. The TrPs were identified by finding a hypersensitive spot in a palpable taut band with a local twitch response elicited by snapping palpation [not tested in suboccipital muscles], referred pain typical of each TrP, and/or recognition of the pain, which distinguished an active from a latent TrP.

All patients had a mean for all four muscles of 4.3 active and 2.5 latent TrPs. The controls had 1.8 active and 2.0 latent TrPs. The difference in the number of active TrPs between the two groups was significant [$P < 0.001$] but not for latent TrPs. The differences in the prevalence of TrPs in the four muscles are of considerable clinical importance:

	Active + Latent	Active Only
Suboccipital muscles	90%	10 bilaterally
R. sternocleidomastoid	85%	5
L. sternocleidomastoid	70%	3
R. upper trapezius	50%	8
L. upper trapezius	40%	7
R. levator scapulae	35%	3
L. levator scap.– 0 active	35%	0

Muscles with significantly related increased numbers of TrPs were the L. upper trapezius and L. levator scapulae [P = 0.005], L. upper trapezius and L. sternocleidomastoid muscles [P = 0.03], and the R. upper trapezius and suboccipital muscles [P = 0.05]. This may relate to key TrPs and deserves further investigation of that issue.

Comments

This is exemplary clinical TrP research [DGS].

Kuan TS, Hsieh YL, Chen SM, Chen JT, Yen WC, Hong CZ: The myofascial trigger point region: correlation between the degree of irritability and the prevalence of endplate noise. Am J Phys Med Rehabil 86(3): 183-189, 2007.

Summary

Three MDs, one MD-PhD, one PhD-PT, and one MD-MS in Taiwan reported the results of examining the upper trapezius muscles of 12 patients with active TrPs and 20 normal, healthy, control subjects free of spontaneous pain to compare the pain-sensitive irritability of myofascial trigger points [TrPs] with the prevalence of endplate noise [EPN]. The authors identified latent TrPs by finding a localized tender spot in a palpable taut band, characteristic and consistent referred pain when compressed firmly and an investigator who did not communicate his findings to another investigator who did subsequent testing. A nearby non-TrP control site was marked in the same way. Active TrP sites were identified by the additional finding of patients' recognition of the referred pain as their usual clinical complaint and then corresponding control sites were also similarly marked, blinding subsequent examinations as to the identification of TrP or control sites.

The 0 to 10 visual analog scale used to estimate pain intensity was anchored mid-scale by calling the subject's attention to the fact that the usually only pain intensity below 5 is considered a tolerable pain. This is important in comparing ratings among individuals because expression of pain is so variable among individuals.

Pressure pain thresholds were determined by averaging three algometer readings and the investigators were blinded as to latent or active TrPs. A two-channel recorder was used to record from an active electrode in the TrP and a control electrode in the nearby control site. Sensitivity was set at 10 microvolts per division and sweep speed at 20 milliseconds per division. The frequency window was 20 to 10 kHz. Their first figure illustrates electrode connections to the recorder. These are well-established procedures for high-quality recording of EPN.

Needle examination of test sites was fully explained and the identical procedures were used for test and control sites. The examiner was blinded as to the identity of the marked sites.

The mean pressure pain thresholds were significantly less for active than for latent TrPs [$P < 0.01$]. The prevalence of EPN was significantly higher in active than in latent TrPs [$P < 0.01$]. No EPN was found in non-TrP regions that served for controls for either active or latent TrPs. The presence of EPN was a specific finding characteristic of either active or latent TrPs. The correlation between prevalence of EPN and pain intensity was high for either group [$r = 0.74$].

These findings are consistent with the concept that the mechanical stimulation of TrPs evokes local twitch responses [LTRs] and activates an LTR locus characterized by sensitized nociceptors, whereas EPN arises from dysfunctional motor endplates. It is not clear to what extent LTR loci and dysfunctional motor endplates have essentially the same locations.

In conclusion, the sensory irritability of TrPs is highly correlated with the prevalence of

endplate noise in the TrP region of upper trapezius muscles. The presence or absence of EPN sharply distinguishes active or latent TrP sites from non-TrP sites. Assessment of EPN prevalence in the TrP region indicates the irritability of that TrP site.

Comments

The results of this study by these competent, and very experienced [see the list of that group's previously published papers listed in their references included in their paper] investigators in this field are in stark contrast to the results reported in a related study by Couppe et al. that is also reviewed in this column in this issue of the Journal of Musculoskeletal Pain.

These results provide a solid foundation for seriously consider EPN [the constant component of spontaneous electrical activity] as a gold standard for identifying TrPs in research studies. Comparison of the results of these two studies makes it clear that for this test to be useful as a gold standard, the investigator examining for EPN must be experienced and skilled in that procedure, and therefore it is unlikely to become available as a routine clinical test [DGS].

Kao MF, Han TI, Kuan TS, Hsieh YL, Su BH, Hong CZ: Myofascial trigger points in early life. Arch Phys Med Rehabil 88: 251-254, 2007.

Summary

Following a brief introduction summarizing the current scientific status of myofascial trigger point [TRP] research, the authors define the hypothesis of this study: "latent TrPs cannot be found in early life, but may develop gradually when the newborns grow up." Sixty adults and sixty infants of less than one year participated in this original study. For each subject, the researchers assessed the pressure pain threshold at three different sites in the brachioradialis muscle using Fischer's algometer. The first spot was just above the lateral epicondyle. The second spot was one-third of the way between the lateral epicondyle and the muscle-tendon junction, while the third spot was at the muscle-tendon junction. Three measurements were performed at each site with at lest one minute between measurements. After determining the measurements, the middle point was manually examined for taut bands. The researchers assumed that the middle spot was the location of a latent TrP.

In adults the mean pressure pain threshold was significantly lower over the middle point than at the other two points, while in the infants, there was no significant difference. In addition, one or more taut bands could be identified in the adults, but none in the infants. The researchers concluded that the assumed TrP site was more irritable than other site in adults but not in infants, suggesting that infants do not have TrPs. They speculated that the formation of latent TrPs may be due to minor neuromuscular damage.

Comments

There are few epidemiologic studies of the occurrence of TrPs in different age groups. An early study from 1968 identified that TrPs were common in patients between 31 and 50 years of age (12). Only three other older studies examined the presence of myofascial pain in children, but they did not include any infants (13-15). A more recent study of musculoskeletal pain syndromes in adolescents is included in this review column (16). This is the first study that compared the presence of TrPs in infants and adults. It is striking that none of the infants had any evidence of taut bands in the brachioradialis muscle. To identify whether there is a certain age at which TrPs start appearing, more studies are needed with different age groups and involving multiple muscles [JD].

Zapata AL, Moraes AJ, Leone C, Doria-Filho U, Silva CA: Pain and musculoskeletal pain syndromes in adolescents. J Adolesc Health 38(6): 769-771, 2006.

Summary

This cross-sectional study of 833 adolescent students of a private school in Sao Paulo, Brazil consisted of a questionnaire followed by a physical examination. Forty-two students were excluded, primarily because of adolescent or

parental refusal. Prior to the actual study a pretest was conducted to fine-tune the test. One pediatric rheumatologist conducted the questionnaire; another performed the physical examination. The researchers assessed students for musculoskeletal pain, including fibromyalgia syndrome, benign hypermobility, myofascial pain syndrome [MPS], and soft tissue stress injuries.

Forty percent of students reported having musculoskeletal pain with 23 percent reporting back pain and nine percent upper limb pain. The physical examination detected 10 percent having benign hypermobility syndrome. Five percent of the students were diagnosed with MPS, defined as the presence of active myofascial trigger points [TrPs] in the trapezius, subscapularis, posterior cervical muscles, biceps, triceps, brachioradialis, wrist and finger extensors and flexors, and intrinsic hand muscles. Myofascial pain syndrome was the second most prevalent musculoskeletal syndrome. Fibromyalgia syndrome was observed in one percent of the children.

Comments

This is an interesting pediatric epidemiologic study of MPS, which was found in approximately five percent of adolescents in an upper and upper middle class subset in Brazil. The researchers did not attempt to identify possible causes of myofascial pain. One could speculate that carrying heavy backpacks may be a possible contributing factor. Although Goodgold did not find a correlation between pain and the weight of backpacks, a more recent study suggested that carrying backpacks with a greater than 10 percent of bodyweight was positively associated with thoracic spine pain, lost school time, lost school sports time, and greater chiropractic utilization (17,18). The prevalence of low back pain and fibromyalgia syndrome in children is similar to other studies (19-22) [JD].

TREATMENT STUDIES

Langford CF, Udvari Nagy S, Ghoniem GM: Levator ani trigger point injections: An underutilized treatment for chronic pelvic pain. Neurourol Urodyn 26: 59-62, 2007.

Summary

Chronic pelvic pain [CPP] is commonly defined as continuous or episodic, non-cyclic pain of at least six months duration, located below the umbilicus, that interferes with activities of daily living or requires medical attention. In this study of eighteen consecutive women [mean age 51] with CPP, all subjects had to have myofascial trigger points [TrPs] in the levator ani muscle as a cause or manifestation of CPP. Seven subjects had a previous diagnosis of interstitial cystitis. All subjects had undergone previous medical treatment consisting of opioid medication and amitryptiline. They had not received previous injections into the levator ani muscle. Trigger points were identified through vaginal examination. Each subject had three to five TrPs in the levator ani muscle. The location of the TrPs was reconfirmed just before transvaginal injections of a mixture of 10 cc of 0.25 percent bupivacaine, 10 cc of two percent lidocaine, and 1 cc of triamcinolone. The needle was placed approximately 2 cm into the muscle using a 23 gauge spinal needle through a 5.5 inch Iowa Trumpet Pudendal Needle Guide. Upon withdrawing the needle, the muscle was slowly injected with the solution in 5 cc increments. According to the authors, "many women reported immediate relief of their CPP." Prior to the treatment, all subjects completed a visual analog scale [VAS], which was repeated at a mean of three months post-injection follow up along with the Patient Global Satisfaction [PGS] and Patient Global Cure [PGC] visual scores.

The authors reported a mean pre-injection VAS of 88.8 percent [standard deviation [SD] 17.8], which had decreased to 36 percent at the three-month follow up. Success was defined as a decrease in pain by at least 50 percent and a post-injection score of 60 percent for the PGS and PGC, which was reached in over 72 percent of subjects. Of the subjects with interstitial cystitis, 71 percent had a greater than 50 percent decrease in the VAS, a PGS of 58 percent, and a PGC of 62 percent.

Comments

It is encouraging to see that urologists of the Cleveland Clinic Florida are incorporating

TrPs into their treatment and study protocols. Although this study is a pilot study without a control group, the excellent results of the intervention warrant further studies. It is not clear from this paper how familiar the authors are with recent TrP literature. The authors did not quote any primary TrP articles in their discussion of possible mechanisms of TrPs, such as the recent studies of Shah et al. (23) of the chemical milieu of active TrPs or other recent review articles (24). They did include a study by Weiss (25) of manual TrP therapy for interstitital cystitis and urgency-frequency syndrome. Their injection technique suggests that they did not attempt to elicit local twitch responses with the injections as suggested by Hong (26). Given the positive outcome of the current study, it would be interesting to compare their injection technique with TrP injections aimed to elicit local twitch responses. In the discussion section, the authors acknowledged the need to investigate the optimum mixture and volume of the injectables. However, to the best of this reviewer's knowledge, there is little or no evidence of benefit to TrP injections other than 0.25 percent lidocaine (27) or perhaps botulinum toxin in persistent cases (28). We hope that in future studies, which the authors appear to have in mind, they will include a control group and include TrPs of other pelvic floor muscles. They could compare different interventions, such as the current injection technique, injections or dry needling with local twitch responses, and even manual therapy techniques as successfully used by physical therapists and others. The study does support the notion that CPP may be associated with TrPs in the levator ani muscle [JD].

Fu Z-H, Wang J-H, Sun J-H, Chen X-Y, Xu J-G: Fu's subcutaneous needling: Possible clinical evidence of the subcutaneous connective tissue in acupuncture. J Altern Compl Med 13(1): 47-51, 2007.

Summary

This article explores the effectiveness of two different applications of a relatively new dry needling technique, referred to as Fu's subcutaneous needling [FSN], on myofascial trigger points [TrPs]. Developed in 1996 in China to treat patients with chronic low back pain, fibromyalgia syndrome, osteoarthritis, chronic pelvic pain, post-herpetic pain, peripheral neuropathy, and complex regional pain syndrome, in this paper FSN was applied to TrPs. The authors examined whether there would be a significant difference between directing the needle across muscle fibers or along muscle fibers. Forty-seven patients were randomly assigned to one of two groups. Inclusion criteria were the presence of a tender spot with spontaneous pain with movements, reproduction of symptoms with compression of a TrP, the presence of a taut band, restricted range of motion, age between 18 and 80 years, and TrPs in the neck and upper back for more than one week but less than one year. Exclusion criteria were pregnancy, a history of fractures, a history of surgery of the cervical spine, and analgesic drug intake or other treatments within a week of the study.

The FSN needle consists of three parts: a 31 mm beveled-tip needle with a 1 mm diameter, a soft tube similar to an intravenous catheter, and a cap. The needle is directed toward a painful spot or TrP at an angle of 20-300 with the skin, but does not penetrate muscle tissue. The technique acts solely in the subcutaneous layers, making this a superficial needle procedure. The needle is advanced parallel to the skin surface until the soft tube is also under the skin. At that time, the needle is moved 200 times smoothly and rhythmically from side to side for at least two minutes, after which the needle is removed from the soft tube, which stays in place. Patients go home with the soft tube still inserted under the skin. The soft tube can move slightly underneath the skin because of patients' movements and is thought to continue to stimulate subcutaneous connective tissues while in place. The soft tube is kept under the skin for a few hours for acute injuries and for at least 24 hours for chronic pain problems, after which it is removed. According to Fu et al. (29), the technique has no adverse or side effects and usually induces an immediate reduction of pain. The needle technique should not be painful as subcutaneous layers are poorly innervated.

In the current study, the needle was inserted at a distance of 7 to 8 cm from the TrP. Following the procedure, the soft tube was removed immediately following the intervention to ob-

serve the short-term effects of FSN. The researchers found no differences between the two groups. Both groups improved significantly in all three outcome parameters, including motion-related pain, pressure pain using algometry, and range of motion of the cervical spine. The authors concluded that the direction of the needle makes no difference in the treatment of TrPs in the neck. They speculated that the positive effect of FSN may be due to mechanically induced signal transduction and gene expression of subcutaneous fibroblasts as was recently suggested by Langevin et al. (30) as an explanation for acupuncture.

Comments

The mechanisms of superficial dry needling for TrPs are largely unknown (29). This study of a new superficial dry needling technique demonstrates that pain-free mechanical stimulation of subcutaneous tissues in the vicinity of TrPs is capable of improving range of motion, and reducing pressure and movement-induced pain without ever entering the TrP itself. It is indeed conceivable that the reason this occurs may be related to the mechanical stretching of subcutaneous fibroblasts, which may result in a wide variety of cellular and extracellular events, including mechanoreceptor and nociceptor stimulation, changes in the actin cytoskeleton, cell contraction, variations in gene expression and extracellular matrix composition, and eventually to neuromodulation (29,30). This study provides a new starting point to further explore the mechanisms of superficial dry needling for TrPs. It is a bit strange that nowhere in the study did the authors indicate which muscle or which muscles were needled. Also, the article states erroneously that a FSN needle has a diameter of 10 mm. In reality, a FSN needle has a diameter of only 1 mm [JD].

REVIEWS

Harden RN: Muscle pain syndromes. Am J Phys Med Rehabil 86(Suppl): S47-S58, 2007.

Summary

This review article aims to provide a summary of the current available evidence of the diagnostic and treatment approaches of fibromyalgia syndrome and myofascial pain syndrome [MPS]. We will highlight only the section on MPS. After a brief historical introduction the author emphasizes that numerically, MPS is the "foremost primary muscle pain disorder," according to a 2000 survey of members of the American Pain Society (31). He argues that the lack of widely accepted standard diagnostic criteria for MPS has contributed to a lack of progress in the field with varying opinions and a "standstill" in research. Although there are many problems with the FMS criteria (32), the publication of the criteria has seen an enormous increase in FMS research. Harden makes a plea to develop similar user-friendly MPS criteria that could spark a similar research effort and be used in the clinic without a need for specialized equipment.

Therapeutically, Harden proposes a multidisciplinary approach especially for chronic pain patients including physical therapy, occupational therapy, psychology, therapeutic recreation, and medicine, and outlines the role of each discipline in some detail.

Comments

This is a thoughtful, comprehensive and critical review of the current status of both FMS and MPS. There is much validity to the notion that acceptable MPS diagnostic criteria need to be developed. In fact, in 1998 the International Myopain Society established a multidisciplinary committee to design a study model for validation of diagnostic criteria. The committee was supposed to establish reliable methods for diagnosis of MPS, determine the interrater reliability of trigger point examination, and determine the sensitivity and specificity with which classification criteria can distinguish patients with MPS from healthy control subjects (33). Unfortunately, the committee seems to have perished and there has been little or no follow up.

We do not agree that research in MPS has come to a standstill. The very existence of this review column is proof that many clinicians

and researchers around the globe are participating in MPS research. Nevertheless, the widespread acceptance of TrPs by many medical professional and reimbursement for its treatment has been seriously impeded by the lack of a paper on the diagnostic criteria of TrPs comparable to that on fibromyalgia syndrome (24) [JD].

Yap EC: Myofascial pain–an overview. Ann Acad Med Singapore 36(1): 43-46, 2007.

Summary

From Singapore comes this review article of myofascial pain. The author starts with the notion that medical schools do not pay sufficient attention to muscle and myofascial pain [MPS], leaving a large number of patients undertreated and in pain. The article includes common definitions, the epidemiology of MPS, and features sections on precipitating and perpetuating factors, pathophysiology, and segmental sensitization. In the treatment section, the author emphasized a multifaceted approach to include physical modalities, pharmacology, different trigger point injections and dry needling approaches, and an exercise program aimed to restore muscle balance.

Comments

One of the values of any well-written review article is to introduce a concept to a new audience. Review articles do not necessarily introduce new ideas, but serve to pique the readers' interest. This article, written for the Singapore medical community, succeeds in providing a general overview of the most relevant issues of MPS. At one point, the author refers to myofascial pain as muscles being in "spasm." However, trigger points and taut bands are not considered spasms. Instead, they are endogenous localized contractures within the muscle without activation of the motor endplate, while a spasm can be defined as electromyographic activity as the result of increased neuromuscular tone of the entire muscle and the result of nerve initiated contractions (34) [JD].

Weiner DK: Office management of chronic pain in the elderly. Am J Med 120: 306-315, 2007.

Summary

Over 50 percent of community-dwelling older adults and 75 percent of long-term care facility residents are affected by various chronic pain conditions. In this review article, Weiner emphasized that chronic pain is a treatable syndrome with many potential contributing factors. Proper management may improve functional ability significantly even when the severity of pain is not reduced to the same extent. She included myofascial pain, osteoarthritis and chronic low back pain, fibromyalgia syndrome, and peripheral neuropathy. The section on myofascial pain syndrome reflects the author's knowledge and familiarity with myofascial trigger points [TrPs] and includes essential treatment recommendations.

Comments

Although the section on myofascial pain and TrPs constitutes only a small part of the article, the information is accurate, and should pique the interest of physicians not familiar with TrPs. The author emphasized physical therapy and TrP deactivation with TrP injections or dry needling, as well as the need to identify and manage perpetuating factors [JD].

CASE REPORTS

Roth JK, Roth RS, Weintraub JR, Simons DG: Cervicogenic headache caused by myofascial trigger points in the sternocleidomastoid: A case report. Cephalalgia 27: 375-380, 2007.

Summary

Cervicogenic headaches originate in the structures of the cervical spine, including joints, muscles, and nerves, which may refer pain into various regions of the head. The trigeminocervical complex is generally accepted as a key center of the perceived pain projections. The authors maintain that this model

may not be adequate to explain myogenic referred head pain from myofascial trigger points [TrPs] in the neck and upper back musculature. The heavy reliance on interventional diagnostic procedures, targeting joint arthroplasties or occipital nerve entrapments, is based on abnormal radiographic findings and patients' report of diminished pain, and may negate the contributions of TrPs or intersegmental motion restrictions.

This comprehensive case report describes a 43-year-old male patient with a 25-year history of chronic headaches and neck pain primarily in the right lower occipital region, with radiating sharp pain in a right supraorbital distribution. The pain was aggravated by sleep deficit, weather changes, exercise and exertion, orgasm, neck movements, chewing, driving, Valsalva manoeuvres, and coughing. Over the years, the patient had seen many medical specialists, a chiropractor, and physical therapists. He had received multiple facet blocks, radiofrequency ablation, selective C2 nerve blocks, occipital nerve blocks, multiple pharmacological regimes, etc. Finally, the patient was referred to a specialty head pain clinic, where he was diagnosed with hemicrania continua and possible cervicogenic headache with medication overuse headache. He was admitted to the facility's inpatient unit, where he participated in a 16-day multi-faceted management program, including medication adjustments, behavioral therapy, and multiple interventional procedures. Following discharge, he underwent more procedures, including selective nerve blockades at C0-C2, radiofrequency ablation of the C2-3 facet joint with no appreciable change in symptoms.

He was once again referred to physical therapy to assess a possible musculoskeletal contribution to the head pain. He was noted to have constant head pain varying in intensity between 2/5 and 5/5 on a visual analog scale from 0 to 5, aggravation of head pain with repetitive cervical motion, lifting the head in the left decubitus position, and use of the right arm. He presented with slumped sitting posture, restricted right cervical rotation, cervical extension, and muscle tightness in the right pectoralis muscle. Palpation of the right sternocleidomastoid muscle demonstrated the presence of active TrPs with immediate reproduction of the patient's primary occipital and supraorbital pain. He was diagnosed with primary myofascial pain with contributing muscle imbalances and postural deviations. None of the previous examinations had included an assessment of the sternocleidomastoid muscle.

The patient was treated with a variety of physical therapy interventions, includuing kinesotaping, manual trigger point therapy, EMG biofeedback, and postural training. After only four weeks, he reported a reduction of pain by 70 percent. Six months after being discharged from a 16-session physical therapy course, he reported to be pain free approximately one-third to half of the time, with only mild discomfort for the remainder of the time. His cervical range of motion was normal and he maintained a brief exercise program for range of motion and posture. The authors concluded the article with a detailed discussion of the contributions of TrP in the sternocleidomastoid muscle to persistent head pains.

Comments

This excellent case report illustrates how important TrPs are in the etiology of persistent headaches. Similar to a previous case report about TrPs and headaches by Issa and Huijbregts (35), the article describes the frustrating and expensive 25-year long journey this patient had to experience before getting to a physical therapist familiar with TrPs, their referred pain patterns, and mechanical restrictions. The authors did not include an estimation of costs associated with all the medical interventions the patient had been exposed to, but a conservative estimate puts the expenses in the range of tens of thousands of dollars not to mention the human costs to the patient. The importance of including myofascial pain and its many consequences into the curricula of medical schools, schools of chiropractice, physical therapy, occupational therapy, nursing, etc., cannot be overstated. Clinicians familiar with TrPs have many such stories to tell, although most would not go through the effort of composing and publishing such illustrative case reports. The authors are commended for contributing this case report to the headache literature and for submitting it to one of the premier journals in the field [JD].

BRIEF REPORT

Lavelle ED, Lavelle W, Smith HS: Myofascial trigger points. Med Clin N Am 91: 229-239, 2007.

This review article was prepared for a target audience of generic medical practioners as part of a series of articles on pain management. The authors reviewed the definition, clinical characteristics, and treatment options for myofascial pain syndrome. The report introduces the trigger point concept to physicians who may not be familiar with this body of literature. The authors do not provide many recent references in support of the article with the majority of the references dating to the 1990s. At times, the information is a bit outdated. For example, the authors described ischemic compression therapy quoting the 1999 edition of the Trigger Point Manual (36). Yet, in that volume the term ischemic compression was replaced with the more accurate term "trigger point pressure release" [JD].

LETTERS TO THE EDITOR

Chim D, Brodsky M, Ka-Kit H: Teaching medical students trigger point techniques. Fam Med 39(1): 8, 2007.

Although we usually do not include reviews of letters-to-the-editor, the topic of this letter is of utmost importance. The authors report on their experiences with teaching ultrasound-guided trigger point injections to 26 medical students at the University of California–Los Angeles Center for East-West Medicine. They commented that in spite of the utility of trigger point injections in medical practice, few medical schools include such instructions in their curriculum. We applaud the authors for initiating this project and hope that other medical schools will follow their lead. This project deserves to be published in article format to make it more accessible to other medical schools, schools of physical therapy, chiropractic, etc. [JD].

Wang C, Xiong Z, Deng C, Yu W, Ma W: Miniscalpel-needle versus triggerpoint injection for cervical myofascial pain syndrome: A randomized comparative trial. J Altern Compl Med. 13(1): 14-16, 2007.

This letter-to-the-editor is a report of a scientific study evaluating the effect of a new intervention using a mini scalpel needle [MSN] on cervical myofascial pain syndrome. The MSN technique is thought to combine the effects of acupuncture with micro-invasive surgery. Seventy-two subjects were randomly divided into two groups. Group 1 received MSN treatment, whereby the MSN was placed into a TrP in the upper trapezius muscle for a total of 30 seconds. Subjects in Group 2 received a TrP injection using a mixture of 0.5 ml 1 percent lidocaine and 1.5 ml saline using a 25 gauge needle. No mention was made whether local twitch responses were elicited. Following the interventions, the subjects were observed for 30 minutes. Outcome measures at half a month, two months, and three months following the intervention, were compared to baseline measurements. The outcome measures included pain on a visual analog scale, the Neck Pain and Disability Visual Analog Scale, manual palpation of TrPs, and cervical spine range of motion. The authors concluded that the MSN intervention was significantly more effective than an injection with 0.25 percent lidocaine.

This TrP study from mainland China offers an alternative to TrP injections using a newly developed mini scalpel needle. The authors reported no adverse reactions. One wonders why the authors did not submit this well-designed and executed study to a peer-review process, but instead chose the letter-to-the-editor format to report their findings [JD].

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doi:10.1300/J094v15n04_10