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Trigger point therapy. Is it effective for pain and improving patient function?

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Trigger point therapy. Is it effective for pain and improving patient function?

Disciplines

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Critically Appraised Topic

Title: Trigger point therapy. Is it effective for pain and improving patient function?

Clinical Scenario: This question was spurred on for me by a 33y/o female triathlete that I was seeing for IT band syndrome. Upon examination, I found that she had hip extension that was primarily driven by hamstring and paraspinal musculature and no gluteal recruitment for hip extension while she was running. I palpated her gluteals and found multiple, painful trigger points that could be inhibiting muscle recruitment in that area.

Brief Introduction: For the purpose of my clinical question, I would like to know if the treatment of trigger points has been shown to improve pain and function for the patient. Where I am currently working, the therapists use a lot of trigger point therapy to normalize tissue and aid in regaining muscular control and strength. Is this treatment truly effective for patients?

My clinical Question: In patients with orthopedic muscular pathologies, is the use of trigger point therapy effective in relieving pain and restoring function?

Clinical Question PICO:

Population - Adults with orthopedic pathologies where trigger points are present. Age 18-85.

Intervention - Trigger point therapy

Comparison - conventional massage

Outcome - decreased pain and increased function

Overall Clinical Bottom Line: After reviewing the Delaney et al. and the Nagrale et al. articles, it is apparent that trigger point therapy is effective in reducing patient's pain and increasing their function. Both studies looked at self-reported pain rankings and also looked at objective measures such as range of motion, heart rate, and blood pressure. Both of these articles were randomized controlled trials and did a good job of supporting their use of questionnaires to assess certain outcomes. Though the Hains et al. article was founded on an interesting theory, I felt that carpal tunnel syndrome focus was a bit outside of what I was focusing on for this clinical question. Overall, I believe that trigger point therapy has been shown to improve patient pain and function and I would employ this technique in the clinic regularly when called for.

Search terms: trigger point therapy, massage, physical therapy

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Rationale for chosen articles:

My search began in the CINAHL database and I was able to locate three articles on trigger point therapy fairly rapidly. Interlibrary loan was not needed as the full text versions of the papers were available online through the library. I was interested in all three of the articles that I selected. Ultimately, I chose the Delaney et al. and the Nagrale et al. articles to review. The Nagrale et al. paper scored the highest on the PEDro score and fit my clinical question the closest. I felt that the Delaney et al. article was also a good fit. It's PEDro score was not as high, but the outcome measures were of interest and I felt that the body areas addressed were a closer fit to most patients that are seen in the clinic. The Hains et al. study was very interesting as it addressed carpal tunnel syndrome and the possible role that trigger points play in that diagnosis. Unfortunately, I felt that the study design was lacking and the area of focus was not typical for the patient population I was interested in.

Table 1. Comparison of PEDro Score (ranked by David Cieslowski)

	Delaney et al.	Hains et al.	Nagrale et al.
Random	1	1	1
Concealed allocation			
Baseline comparability	1	1	1
Blind subjects		1	
Blind therapists			1
Blind assessors			1
Adequate follow-up	1		1
Intention-to-treat			
Between group	1	1	1
Point estimates and variability			1
Total score	4/10	4/10	7/10

1)Delaney JPA, Leong KS, Watkins A, Brodie D. The short-term effects of myofascial trigger point message therapy on cardiac autonomic tone in healthy subjects. *Journal of Advanced Nursing*. 2002;37(4):364-371.

PEDro score: 4/10

Patient: Healthy male and female participants.

Intervention: Trigger point therapy to head neck and shoulder region for 20 minutes.

Comparison: Relaxation for 20 minutes.

Outcome Measure: Heart rate data, self-reported emotional state and muscle tension, blood pressure.

2)Hains G, Descarreaux M, Lamy AM, Hains F. A randomized controlled (intervention) trial of ischemic compression therapy for chronic carpal tunnel syndrome. *Journal of the Canadian Chiropractic Association*. 2010;54(3):155-163.

PEDro score: 4/10

Patient: Patients with carpal tunnel syndrome and palpable trigger points around biceps, biceps aponeurosis, and pronator teres.

Intervention: Trigger point therapy to biceps, biceps aponeurosis, and pronator teres.

Comparison: Trigger point therapy to supraspinatus, deltoid, and infraspinatus.

Outcome Measures: Self-reported severity of symptoms, functional status, and rating of perceived improvement.

3)Nagrle AV, Glynn P, Joshi A, Ramteke G. The efficacy of an integrated neuromuscular inhibition technique on upper trapezius trigger points in subjects with non-specific neck pain: a randomized controlled trial. *Journal of Manual and Manipulative Therapy*.2010;18(1):37-43.

PEDro score: 7/10

Patient: Patients with non-specified neck pain and active trigger points. Age 18 to 55.

Intervention: integrated neuromuscular inhibition technique including trigger point therapy.

Comparison: muscle energy technique.

Outcome Measures: pain intensity, lateral neck flexion, neck disability.

Article #1: Delaney JPA, Leong KS, Watkins A, Brodie D. The short-term effects of myofascial trigger point massage therapy on cardiac autonomic tone in healthy subjects. *JOAN*. 2002;37(4):364-371.

Clinical Bottom Line: Given the data on self-reported muscle tension and emotional tension on a visual analogue scale, trigger-point therapy is an effective treatment for myofascial pain over relaxation only.

Article PICO:

Patient: Healthy male and female participants.

Intervention: Trigger point therapy to head neck and shoulder region for 20 minutes.

Comparison: Relaxation for 20 minutes

Outcome Measures: Heart rate data, self-reported emotional state and muscle tension, blood pressure

Blinding: There was no blinding of subjects, therapists, or assessors with this study.

Controls: The control group sat quietly and relaxed for 20 minutes in a separate room.

Randomization: Subjects were randomly assigned to two age and sex-matched groups and the randomization was not concealed. The randomization was successful as both groups had no significant statistical differences at baseline.

Study: This was a randomized controlled study in which 15 subjects received myofascial trigger-point massage for twenty minutes(intervention) and 15 subjects relaxed for twenty minutes (control). Subjects were volunteers who were recruited through email, bulletin boards, posters, and verbal

requests. All subjects were in good health standing with no condition that could affect heart rate values or taking any medications that could affect the cardiovascular system. Subjects were asked to refrain from using caffeinated beverages and smoking at least 8 hours prior to the study. Subjects were also asked to keep body movements to a minimum and to not intentionally alter their respiration during the study.

Outcome Measures: Outcome measures that I am interested in from this study are the self-perceived muscle tension and the self-perceived emotional tension readings. These measurements were taken at baseline and then again after treatment. A 100mm visual analogue scale was used to record this data. Evidence has shown that the use of VAS is valid to examine health and quality of life in study participants.

Study Losses: There were no reported study losses.

Summary of Internal Validity: In my opinion, the internal validity of this study is fair. The subjects were randomized into a treatment and control group. However, there was no blinding of subjects, assessors, or therapists. The same therapist performed the trigger-point therapy on the subjects. I see this as strengthening the internal validity of this study as it adds consistency to the treatment and bypasses possible inter-rater reliability issues. The VAS outcome measures have also been shown to be valid measurements, so this also adds to the internal validity strength.

Evidence: The authors provided ample descriptive statistics for both baseline and post-treatment measures. Here are the two areas that I was interested in:

Table 1.1: Trigger-point therapy outcomes for muscle tension and emotional tension

Measurement (VAS)	Pre-treatment (SD)	Post-treatment (SD)
Muscle tension (mm)	41 (3.0)	25 (4.4)
Emotional tension (mm)	47 (3.2)	32 (3.9)

Table 1.2: Relaxation (control group) outcomes for muscle tension and emotional tension

Measurement (VAS)	Pre-treatment (SD)	Post-treatment (SD)
Muscle tension (mm)	35 (5.0)	33 (3.1)
Emotional tension (mm)	38 (5.2)	35 (3.4)

Table 1.3 Effect size

Measurement (VAS)	Treatment group effect size	Control group effect size
Muscle Tension	5.33 (Large)	.40 (Medium)
Emotional Tension	4.69 (Large)	.58 (Medium)

Given the data for both trigger-point therapy and relaxation, we can see that there is a large effect size with trigger-point therapy on self-perceived muscle tension and emotional tension. What is interesting to note is that there is a medium effect size with relaxation alone. For some populations, relaxation alone may also be an option for reducing patient symptoms.

Applicability of Results:

Benefits vs. Costs: After looking at the evidence provided, my analysis moves in favor of trigger-point therapy to improve self-perceived muscle tension and emotional tension. Trigger-point therapy is a cost-effective form of manual physical therapy. This technique is included in the education of a physical therapist and is available to a wide variety of patients.

Feasibility of Treatment: The treatments provided in this study would be easily available to patients in the outpatient, orthopedic clinical setting.

Summary of External Validity: Threats to the external validity of this study would be a lack of blinding on the part of the subjects, therapists, and assessors. I also believe that the sample size is too small to lend much power to this study. However, these threats are not great enough to overcome the large effect size shown by trigger-point therapy in my opinion. Given the data, it would not be difficult to generalize these results to a larger orthopedic population.

Article #2: Nagrale AV, Glynn P, Joshi A, Ramteke G. The efficacy of an integrated neuromuscular inhibition technique on upper trapezius trigger points in subjects with non-specific neck pain: a randomized controlled trial. *JOMAMT*.2010;18(1):37-43.

Clinical Bottom Line: Given the data on treatments including trigger-point therapy (INIT) and post-isometric relaxation technique (MET), both would be effective in increasing cervical range of motion and decreasing pain in a broad patient population. Treatments including trigger-point therapy seems to have a larger treatment effect, but both treatments score in the large treatment effect category.

Article PICO:

Patient: Patients with non-specified neck pain and active trigger points. Age 18 to 55.

Intervention: integrated neuromuscular inhibition technique including trigger point therapy.

Comparison: muscle energy technique.

Outcome Measures: pain intensity, lateral neck flexion, neck disability.

Blinding: This is a single blinded, randomly controlled study. The examining therapist was blinded to baseline measurements and all recording was done by an independent observer. The treating therapist was blinded to group allocation until after the examining therapist was finished with measurements.

Controls: There was no true control group with this study. One treatment group received muscle energy technique (MET) consisting of post-isometric relaxation to the upper trapezius and the other treatment group received integrated neuromuscular inhibition technique (INIT), which included trigger-point therapy, to the upper trapezius.

Randomization: Subjects were randomly assigned to the MET group and the INIT group using a computer generated block of randomized numbers. Group allocation was concealed from treating therapist.

Study: This was a randomized controlled study. Subjects were referred from health care providers and volunteered after seeing advertisements that had appeared in local newspapers and health magazines. Subjects were 18 to 55 years of age, suffering from non-specific neck pain. Subjects were required to have neck pain for less than three months, with active trigger-points in the upper trapezius. Exclusionary criteria included subjects who had been in motor vehicle accidents, significant collision trauma, signs and symptoms of serious medical pathology, signs of cervical spinal cord compromise, two or more signs of nerve root involvement, previous neck surgery, cervical degeneration, endocrine disorders, autoimmune conditions, or having received trigger-point injections in the upper trapezius within the past 6 months. Sixty patients were randomized into two treatment groups using computer generated random numbers. One group of 30 received MET to the upper trapezius muscle and one group of 30 received INIT to the upper trapezius.

Outcome Measures: Outcome measures from this study that interest me are measurements of pain taken with a 10cm visual analogue scale and lateral neck flexion measurements taken with a cervical range of motion goniometer. The VAS has been shown in research to be a reliable and valid measurement tool. The CROM device has been shown to have good to excellent inter-rater reliability as well .

Study Losses: There were no reported study losses.

Summary of Internal Validity: In my opinion, the internal validity of this study is strong. The outcome measures that the authors use have been shown to have good to excellent validity (VAS and CROM). I felt that blinding in this study was well done. All recordings were done by independent observers, the examining therapist was blinded to all records, and the treating therapist was also blinded to group allocation until the patient was in the room. Procedures for both the MET group and the INIT group were also standardized. The only threat to internal validity that I see is a lack of a true control group.

Evidence:

Table 2.1 Change scores at 2 and 4 weeks for MET group

Outcome measure	Change score (SD) at two weeks	Change score (SD) at four weeks	Effect Size
VAS for pain (cm)	7.03 (.69)	6.10 (.68)	1.35 (large)
Lateral neck flexion (degrees)	27.65 (1.59)	29.33 (1.72)	1.06 (large)

Table 2.2 Change scores at 2 and 4 weeks for INIT group

Outcome measure	Change score (SD) at two weeks	Change score (SD) at four weeks	Effect Size
VAS for pain (cm)	6.46 (.55)	5.28 (.47)	2.15 (large)
Lateral neck flexion (degrees)	30.71 (1.42)	34.44 (1.2)	2.63 (large)

The INIT group shows the larger treatment effect. Of interest is the fact that both treatment groups display a large treatment effect overall.

Applicability of Results:

Benefits vs. Costs: After looking at the data presented in this study, it can be shown that treatment regimens that include trigger-point therapy are beneficial and I would definitely use it in the clinical setting. Both treatments that were used in this study have been shown to be effective for increased ROM and decreased pain. Because of their manual nature, the costs of providing these therapies is relatively low. So, the benefits do outweigh the costs.

Feasibility of Treatment: Both trigger-point therapy and post-isometric relaxation are taught in PT school and are at the disposal of most physical therapists. Because of this, the treatment is very feasible for a larger patient population.

Summary of External Validity: This study, in my opinion, has strong external validity. A power analysis was done to determine adequate sample size, there were no study losses, blinding was well done, and the statistical analysis of the data was appropriate. I would have no reservations about applying these results to a larger patient population. The only overall threats to this study were a lack of a true control group and unequal treatment times between the two groups.

Synthesis and Discussion: Given the data presented in these two studies, I believe that therapy plans that integrate trigger-point therapy are a valid treatment to improve pain perception and range of motion in the orthopedic population. The techniques are relatively simple, available in many clinics, and cost effective. What I found interesting in both of these articles was that the comparison treatments of post-isometric relaxation and relaxation techniques were also very effective with pain perception and range of motion. If trigger-point therapy were not appropriate for a particular patient, I would have no reservations about using one of these techniques as well to aid the patient in their return to functional well-being.