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Scientific/Clinical Article

Kinesio taping and manual pressure release: Short-term effects in subjects with myofascial trigger point



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ABSTRACT

Study design: Randomized controlled trial.

Introduction: Myofascial pain syndrome is characterized by myofascial trigger points (MTrPs) and fascia tenderness.

Purpose of the study: We investigated the effects of manual pressure release (MPR) alone or in combination with taping (MPR/MKT) in subjects with MTrPs.

Methods: Fifteen and 16 subjects received MPR and MPR/MKT respectively. Outcomes including Pressure pain threshold, muscle stiffness, mechanomyography were assessed at baseline, post-intervention and 7-days later.

Results: Pressure pain threshold improved significantly ($d = 1.79, p < 0.005$) in both groups. Significant improvement in muscle stiffness in the MPR/MKT group (0.27–0.49 mm) as compared to the MPR group (–0.02–0.23 mm). Mechanomyography amplitude in the MPR/MKT group was significantly higher than that of the MPR group ($p < 0.05$).

Conclusion: MPR and MPR/MKT are effective in reducing pain in these subjects. MPR/MKT has a greater effect on muscle stiffness and contraction amplitude.

Level of evidence: IV.

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Myofascial pain syndrome (MPS) is a pain syndrome characterized by myofascial trigger points (MTrPs) and fascia tenderness.^{1,2} A MTrP is defined as a hyperirritable spot associated with a taut band of a skeletal muscle that is painful on compression or stretching.^{2,3} The MTrP facilitates a local twitch response under snapping palpation and can be stimulated locally by compression; and causes pain, tenderness, autonomic phenomena and motor dysfunction. This reaction is not only local, but also distally in a target area as referred pain that is specific to each muscle.^{2,4,5} Additionally, muscle weakness and severe limitation in the range of motion of the affected muscle

can further result in disability. Consequently, patients with MPS can have impairment of their work, social activities and quality of life.⁵

Management of MPS can be based on the proposed mechanisms of causing MTrP.² Travell and Simons³ presumed that excessive acetylcholine release occurring in a muscle contraction can lead to a perpetuated shortening of the muscle and development of MTrPs. Based on this, inactivating TrPs is a potential treatment option. Such treatments include ischemic compression,³ spray and stretch,³ manual pressure release,^{4,5} needling technique,^{6,7} and physical therapy modalities.³ Manual pressure release of MTrPs can reduce spontaneous pain and increase the pressure pain threshold in patients with shoulder impingement.⁴ Manual pressure release on upper trapezius with trigger point has been reported to improve cervical range of motion and reduce the pressure pain sensitivity.⁴ Injection is effective but is an invasive and unpleasant process for patients, and has a substantial expertise requirement. Kinesio taping (KT), using an adhesive tape with elasticity over the contraction muscle, is another treatment option.⁸ This technique can be used in an attempt to normalize muscular function, increase lymphatic and vascular flow, diminish pain, and aid in the

Ethical approval: All participants gave written informed consent to participants in the captioned study and the research was approved by the Committee on the Use of Human Subjects in Teaching and Research of National Taiwan University Hospital. Clinical Trial Registration number is NCT02029391.

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correction of possible articular malalignments.^{9,10} Although KT has been increasingly used in rehabilitation protocols and the prevention of sports injuries, scientific evidence of its effectiveness in patients with MPS is limited.

The proposed effects of KT on MTrP can be tested with mechanomyography (MMG). MMG is used to detect the pressure waves from vibrations of contracting muscles.¹¹ Stiffness or a taut band of muscle can change the pressure wave detected by MMG.¹² When the subject reaches maximal force, stiffness can reduce the amplitude of the signal due to the synchrony of motor unit twitches, which also limits the oscillation. In subjects with MTrP, a taut band and trigger point of the muscle can lower the amplitude and increase the frequency of the pressure wave detected by MMG. We believe that Kinesio taping can reduce the taut band/stiffness and pain of the contracted muscle in subjects with MTrP.

This study had two purposes. The first was to compare the effects of manual pressure release and manual pressure release plus Kinesio taping on the pressure pain threshold, muscle stiffness, and the vibration amplitude/frequency of muscle contraction in subjects with upper trapezius MTrP. The second purpose was to explore relationships between the pressure pain threshold, muscle stiffness, and the vibration amplitude/frequency of muscle contraction towards understanding possible mechanisms of action of manual pressure release and KT in these subjects.

Methods

Design and subjects

This was a randomized controlled trial. All participants were blinded and randomly allocated to the manual pressure release group (MPR) or the manual pressure release plus Kinesio taping (MPR/MKT) group. Based on the judgment of what constitutes clinically meaningful differences and variability estimates from a

previous study,¹³ a sample size of 15 subjects per group provided 80% power to detect differences of 50% difference in the pressure pain threshold (PPT) between the 2 groups of interest at an alpha level of 0.05 with a two-tailed test.

Subjects received a written and verbal explanation of the purposes and procedures of the study. If they agreed to participate, they signed informed consent forms approved by the Human Subjects Committee of University hospital. Consenting patients were randomized by computer generated permuted block randomization of 5 to receive different treatments. Outcome measurements were collected at baseline, post-intervention, and 7-day follow-up (Fig. 1).

Patients were recruited from the general population using public postings in several health care units and referrals from physicians in the Chronic Pain Service at a university hospital. Criteria for the diagnosis of myofascial trigger points in the upper trapezius muscle were the following: (1) a palpable taut band and tender spot; (2) patient's recognition of pain on stretching the tissues; (3) normal neurological examination; and (4) pain characterized as *dull* or *deep* that is exacerbated during stress.² Participants were excluded if they (1) were diagnosed with fibromyalgia syndrome; (2) had received myofascial therapy within the past month; (3) had a history of cervical spine or shoulder surgery; (4) were diagnosed with cervical radiculopathy or myelopathy; (5) had taken medicine that might change the pain intensity or pain threshold; or (6) had a history of previous surgery on the affected areas. Each subject signed an informed consent form approved by an Institutional Review Board.

Procedures and measurements

After signing the informed consent form, the subjects were examined by an assessor blinded to treatment group to establish the clinical conditions of MTrP in upper trapezius muscle

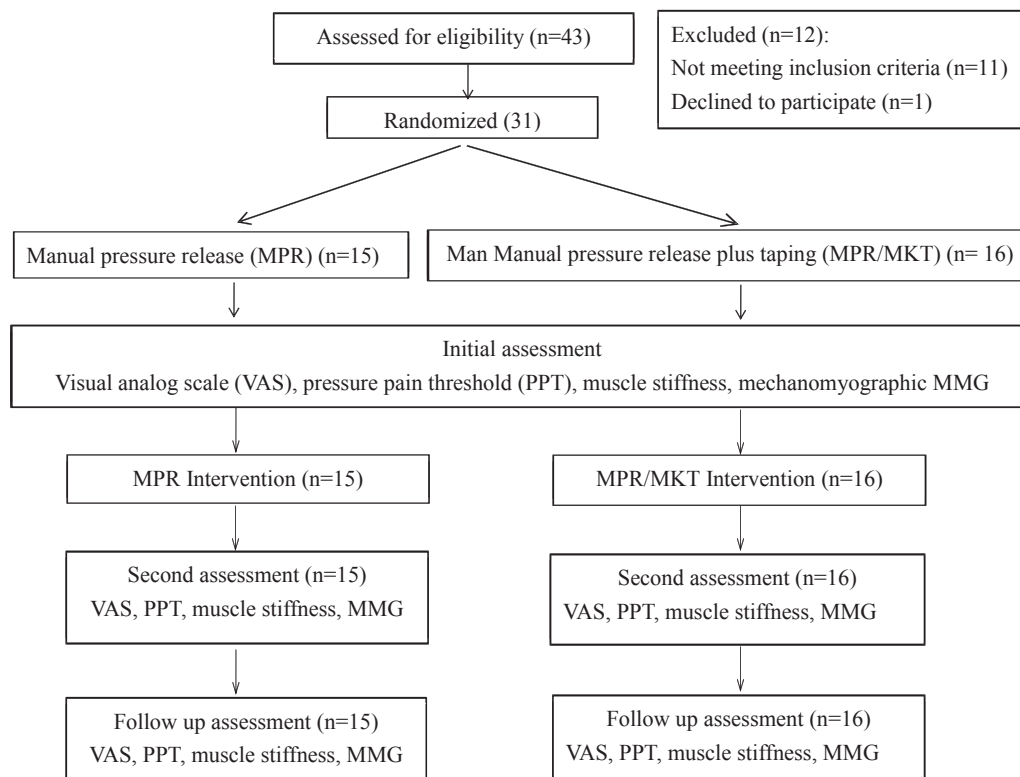


Fig. 1. Flow chart of study participants. Second assessment was conducted at post-intervention. Follow-up assessment was conducted at 7-day after initial intervention.

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