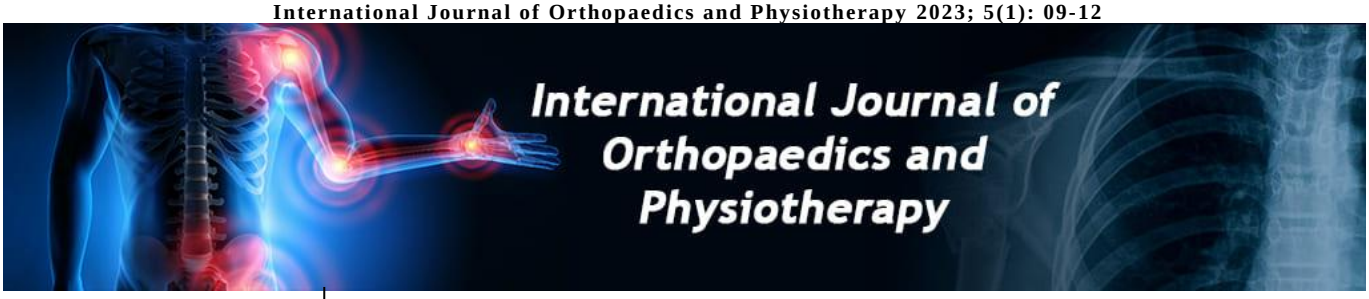

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Kinesio instrument-assisted soft tissue mobilization versus stripping massage for myofascial pain of upper trapezius

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Abstract
Background: Myofascial pain syndrome is chronic pain caused by trigger points. It is associated with musculoskeletal problems muscle spasm, restricted range of motion and decreased fibre extensibility.
Objective: To study the effectiveness of Kinesio Instrument-Assisted Soft Tissue Mobilisation (KIASTM) versus stripping massage (SM) on myofascial pain of Upper Trapezius.
Method: Sixty patients aged 30-40 years, with active trigger points in the right upper trapezius were divided into two equal groups (A and B). Group A (n = 30) received KIASTM using accel tool twice a week for four weeks in addition to stretching exercise. Group B (n = 30) received SM twice a week for four weeks in addition to stretching exercise. The visual analogue scale, a pressure algometer, and the Arabic version of the Neck Disability Index were used to evaluate patients' pre- and post-treatment statuses.
Results: Within-group analysis showed significant differences between pre- and post-treatment values of all outcome measures in both groups.
Conclusion: We concluded that KIASTM is more effective and satisfactory in reducing pain and function in patients with Myofascial Pain of Upper Trapezius.

Keywords: Arabic version of the neck disability index, kinesio instrument-assisted soft tissue mobilisation, myofascial trigger points, stretching exercise, stripping massage

Introduction

Myofascial pain syndrome is a compound of sensory, motor, and autonomic symptoms that are caused by myofascial trigger points Myofascial pain commonly affects the neck and shoulder muscles, with the upper trapezius the most involved. Patients with myofascial pain represent a large number of musculoskeletal patients. It has been estimated that around 85% of patients visiting chronic pain clinics and 30% of patients visiting internal medicine clinics have myofascial pain Instrument-assisted soft tissue mobilization is one of the techniques used to treat Myofascial pain. After an injury, inflammation and proliferation of inflammatory cells occur, during which fibrosis and scar tissue formation in the injured soft tissue may occur. These changes reduce tissue elasticity and cause adhesions, diminishing soft tissue function and pain. In particular, scar tissue limits perfusion to the injured soft tissue, restricting oxygen and nutrients supply and interfering with collagen synthesis and tissue regeneration, which may then cause incomplete functional recovery and increase the risk of re-injury. KIASTM creates micro trauma to scar tissue or myofascial adhesions using a specially designed instrument to reduce pain and improve range of motion and function. Additionally, it minimizes the stress on the practitioner's hand and the effort he has to put forth.

Kinesio Instrument assisted soft tissue mobilization (KIASTM) is a popular treatment for myofascial restriction based upon the rationale introduced by James Cyriax. Unlike the Cyriax approach utilizing digital cross friction, KIASTM is applied using specially designed instruments to provide a mobilizing effect to soft tissue (e.g., scar tissue, myofascial adhesion) to decrease pain and improve range of motion (ROM) and function. The use of the instrument is thought to provide a mechanical advantage for the clinician by allowing deeper penetration.

There are various IASTM tools and companies such as Graston®, Técnica Gavilán®, Hawk Grips®, Functional and Kinetic Treatment and Rehab (FAKTR)®, Adhesion Breakers® and Fascial Abrasion Technique™ that have their own approach to treatment and instrument design the Graston® technique contains a protocol for treatment that contains several components: examination, warm-up, IASTM treatment (e.g., 30-60 seconds per lesion), post treatment stretching, strengthening, and ice (only when subacute inflammation is of concern IASTM is to enhance myofascial mobility with limited adverse effects such as discomfort during treatment or bruising after treatment.

Stripping massage (SM) is a gliding tissue massage technique that focuses on the deeper layers of the fascia and skeletal muscle. 13 It is considered an effective and safe method that can manually deactivate myofascial trigger points using a direct approach.5 Applying SM to tender spots in muscles can cause ischaemia followed by reflexive hyperaemia. This increases the local blood flow, which improves pliability of the muscles and fascia and helps break down adhesions and decrease pain sensations.

Methodology

Study design this was a randomized clinical trial performed in the outpatient Physiotherapy department of J.R.N Rajasthan Vidyapeeth University, Udaipur.

Sixty patients aged 30-40 years, with active trigger points in the right upper trapezius were divided into two equal groups (A and B). Group A (n = 30) received KIASTM using an accel tool twice a week for four weeks in addition to stretching exercise. Group B (n = 30) received SM twice a week for four weeks in addition to stretching exercise. The visual analogue scale, and the Arabic version of the Neck Disability Index were used to evaluate patients' pre- and post-treatment. They were then randomly allocated, using sealed envelopes, into two groups, A and B. Group A received KIASTM on the RT upper trapezius twice a week for four weeks in addition to stretching exercise. Group B received SM on the RT upper trapezius twice a week for four weeks in addition to stretching exercise.

Subjects were included in the study if they had neck pain in the right (RT) upper trapezius muscle with a tender nodule, constant pain, a jump sign during palpation, and referred pain over the lateral aspect of the upper trapezius that extends superiorly to the RT occiput. Were excluded if they had latent trigger points, signs of severe pathology such as malignancy, fractures of the cervical spine, cervical radiculopathy or myelopathy, or vascular syndromes such as vertebrobasilar insufficiency.

All variables were assessed before and after the treatment programme. The Visual Analogue Scale (VAS) was used to evaluate pain intensity. The VAS is a self-reported pain measurement scale, consisting of a horizontal or vertical line, usually 10 cm long. The extremes of the line are labelled as no pain and worst pain. Each subject was asked to mark the point on the line that exactly corresponded to his/her pain. The ANDI was used to assess neck function. It is a valid and reliable tool that consists of 10 items. Each item is scored from zero (No disability) to five (Total disability), with the maximum possible total score being 50. For each item, the subject was asked to choose one answer that best defined his/ her neck function. Scores for each item were tallied and the recorded.

Procedure: First, the accel tool was used to find the exact areas of restriction in the RT upper trapezius. Then the accel tool was used, at an angle of 45 and using treatment planes 1, 2, and 3, to apply slow strokes along the muscle, without causing any discomfort or pain, from the muscle origin to its insertion (Sweeping technique) for approximately 3 min. This procedure was repeated twice a week for four weeks. Subjects were instructed to put an ice pack on the area if they felt any burning sensations after the session. After KIASTM session, each subject received passive stretching exercise of the RT upper trapezius. This involved laterally flexing the head toward the left side, holding that position for 30s, and repeating 3 times. Flexion of the neck was increased, when appropriate, to increase the tension of the stretch. Subjects were advised to perform self-stretching exercise 5 times a week as a home programme. For performing self-stretching, each subject was instructed to sit on a chair, holding the bottom of the seat with his/her RT hand to stabilize the RT shoulder, and put his/her left hand on his/her head to pull the head toward the left side. Subjects were instructed that flexion of the neck could be increased, where appropriate, to increase the tension of the stretch, and that they were required to maintain the position for 30 s and repeat 3 times. Stripping massage For SM, the subject was seated in the same position as for KIASTM. The nape of the neck was exposed and minimal lubricant was applied. Using the thumb, firm, slow pressure was applied along the length of the taut RT upper trapezius muscle and perpendicular to its fibres, moving from origin to insertion for approximately 3 min, twice a week for 4 weeks. Pressure was gradually increased with each successive stroke, according to the subject's pain tolerance. As in group A, each subject also received passive stretching exercise and was advised to perform self-stretching exercise 5 times a week as a home programme. The researcher who performed all techniques had over 14 years of experience in manual physical therapy practice.

Result

In group A, there were significant differences between pre and post-treatment values of all outcome measures, as shown in Table VAS and ANDI scores decreased by 60% and 55%, respectively significant p value (0.001), while, In group (B) there were also significant difference between pre and post-treatment values of all outcome measures. VAS and ANDI scores decreased by 55% and 50%, respectively significant p value (0.005).

Table 1: Pre and post treatment, SD, value of VAS score both of group

Vas	Group a	Group b	P value
Pre (Mean ±SD)	6.05±2.10	7.10±0.90	0.001
Post (Mean ±SD)	3.60±1.90	3.50±0.60	

Table 2: Pre and post treatment, SD, value of ANDI score both of group

ANDI	Group a	Group b	P value
Pre (Mean ±SD)	22±3.10	26±3.20	0.005
Post (Mean ±SD)	12±4.10	10±2.60	

Discussion

This research was performed to study the efficacy of KIASTM versus SM in subjects with RT upper trapezius active myofascial trigger points. Both groups showed

improvements in all outcome measures. The improvements in patients who received SM may be explained by the close contact with the subject's tissue while applying SM, which allows the practitioner to feel any restrictions easily. Therefore, the appropriate force can be applied according to the presence of involved trigger points and according to subject tolerance. In addition, SM helps to increase flexibility by breaking down adhesions in the fascia and relaxes spasm muscle by increasing circulation. Massage provides a sensory stimulus over these tender spots, which produces an analgesic effect by activating non-nociceptive fibres and alleviating the pain sensation, according to gate control theory. SM acts as a mechanical stress that stimulates parasympathetic activity which leads to the release of substances such as endorphins. These chemicals remove the noxious stimulus and decrease the pressure on nociceptors, reducing pain. The results of this study came in agreement with Domingo *et al*., investigated the effect of two 5-minute sessions of moderate-pressure massage on the upper trapezius and concluded that massage can lower upper trapezius muscle activity and promote relaxation. Furthermore, Skillgate *et al*., examined the effect of massage in decreasing neck pain and they found greater improvement in pain sensation and patient activity after application. Also, Sherman *et al*., stated that massage can improve neck dysfunction greater than self-care after performing 10 massage sessions. The refinement that occurred in KIASTM group may come from its ability to induce tissue micro-trauma. Thus, resulting in the regional inflammatory process and increases the release of fibroblast. The fibroblast migration increases collagen synthesis and tissues regeneration that speeds up the healing process. In addition, increasing tissue temperature and blood flow due to friction between tool and tissue may contribute to improve tissue oxygenation and removal of local waste metabolites. These results were in line with Motimath *et al*., who concluded that KIASTM technique is a useful tool can decrease pain immediately in subjects with upper trapezius spasm. Bulbuli *et al*., tested the effect of KIASTM on subjects with heel pain and they found reduction in pain level and increased activity level and they explained that KIASTM can be used to soften tight fascia by applying rhythmic strokes over the fascia till the adhesions and cross-linkages are broken and the release of the fascia occurred.

Conclusion

We concluded that KIASTM is more effective and satisfactory in reducing pain and function in patients with Myofascial Pain of Upper Trapezius.

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Author's Contribution

Not available

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