



IMMEDIATE EFFECTS OF KINESIOTAPING AND CYRIAX TRANSVERSE FRICTION MASSAGE ON LATENT MYOFASCIAL TRIGGER POINTS IN COMPUTER USERS.

¹*Akhtar Pooja M., (PT) M. P.Th and ²Ivnish Gujral, B. P.Th.

¹Assistant Professor in Physiotherapy, V.S.P.M's College of Physiotherapy, Digdoh Hills, Hingna, Nagpur.

²V.S.P.M's College of Physiotherapy, Digdoh Hills, Hingna, Nagpur.

***Author for Correspondence: Dr. Akhtar Pooja M.**

Assistant Professor in Physiotherapy, V.S.P.M's College of Physiotherapy, Digdoh Hills, Hingna, Nagpur.

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ABSTRACT

Myofascial trigger point (MTrPs) is a sensitive, hyperirritable spot in a taut band which is painful on compression or stretch and gives rise to a typical referred pain pattern. Kinesiotaping is a therapeutic concept often used as a supplementary method to restore proper functioning of the muscles by means of special tapes. Transverse Friction Massage (TFM) is a deep tissue technique which causes immediate pain relief and increase in strength and mobility. The study aimed to compare the immediate effects of a Kinesiotaping with Cyriax transverse friction massage in myofascial trigger point (MTrP) tenderness. One hundred twenty computer operators, aged 30–50 years, presenting with chronic mechanical neck pain and presented with latent MTrPs in the upper trapezius muscle, according to the diagnostic criteria described by Simons and Gerwin, were enrolled as subjects and were divided randomly into two groups: Group A treated by Kinesiotaping, and group B treated with Cyriax transverse friction massage. The outcome measures were visual analogue scale assessing local pain evoked by an application of 2.5 kg/cm² of pressure using pressure algometer on the MTrP and cervical lateral flexion range of motion to opposite side assessed pre-treatment and 2 min post-treatment by a blinded assessor. There was a significant decrease in the mean pain scores from 6.1 to 4.2 in Kinesiotaping group and 6.13 to 2.966 in Cyriax massage group. When the two modalities were compared for decrease in pain, Cyriax was better in reducing the pain ($p=0.01$) while no statistically significant difference was observed in the cervical lateral flexion (p value= 0.3). Conclusion: Cyriax transverse friction massage was more effective in pain reduction in latent MTrPs.

KEYWORDS: Myofascial trigger points, Kinesiotaping, Transverse friction massage.

INTRODUCTION

Myofascial trigger point (MTrPs) is a sensitive, hyperirritable spot in a taut band which is painful on compression or stretch and gives rise to a typical referred pain pattern. An active trigger point gives spontaneous pain sensation, is always tender and produces pain in response to the muscle movement.^[1] A latent trigger point is usually asymptomatic, clinically quiescent and painful only when palpated.^[2] Factors causing myofascial trigger points are trauma, overuse or overstress, joint dysfunction, psychological stress etc.^[3,4,5]

The aim of the treatment is to reduce the pain and restore normal function. Treatment techniques include pharmacological agents like NSAIDS, muscle relaxants and non-pharmacological therapies such as electrotherapy and manual therapy. Electrotherapy basically includes thermotherapy,^[6] ultrasound, tens^[7] and laser.^[8] Manual therapy techniques include myofascial release, massage, muscle energy techniques, PNF, ischaemic compression^[2] and Jacobson's relaxation

etc. Most of the MTrPs research has concentrated on deactivating active MTrPs whereas latent MTrPs which are prevalent in the community are often neglected.^[9]

Kinesiotaping is a therapeutic concept often used as a supplementary method which aims to restore proper functioning of the muscles by means of special tapes.^[10] It is used in shoulder impingement, plantar fasciitis, Patello-Femoral pain syndromes, Chronic LBP, treatment of sports and repetitive stress injuries, to name a few. Kinesiotaping has also been used in the treatment of different trigger points such as piriformis,^[11] Sternocleidomastoid for TMJ pain,^[12] SCM trigger point for cervicogenic headaches^[13] etc. Only one study reports its use in latent trigger points of upper fibre trapezius.^[14]

Transverse Friction Massage (TFM) is a deep tissue technique which causes immediate pain relief and increase in strength and mobility and is valuable in both acute and chronic conditions. It has a local pain diminishing effect and results in better alignment of

connective tissue fibrils.^[15] It has been used in the treatment of Shoulder-neck pain with Ultrasound^[7], in Soleus muscle pain with Pressure release techniques^[16] and Trapezius trigger points with Ischemic compression^[17]; and PNF technique.^[18]

Only one study in the peer-reviewed literature documents the isolated effects of transverse friction massage in comparison with Ischemic compression pressure in the management of upper trapezius MTrP.^[17] There was no study found in the review comparing the effects of Kinesiotaping with transverse friction massage in treatment of Myofascial Trigger Points in the upper trapezius. Hence, present study was taken up.

MATERIALS AND METHODOLOGY

The study was carried out in the Outpatient department of Physiotherapy, in a Tertiary Care Academic Institute with an aim to compare the immediate effect of Kinesiotaping and Cyriax transverse friction massage on tenderness of latent Myofascial trigger points of upper trapezius. The objectives of the study were to study the immediate effects on pain and cervical ROM following a single treatment involving Kinesiotaping and Cyriax transverse friction massage in latent Myofascial trigger points and to compare the effects of the two treatments.

It was a non-randomized, comparative study conducted on 120 clerical staff of the Institute using computers, having a palpable taut band with a hypersensitive tender spot in the Upper fibres of trapezius, complaining of pain upon compression (Latent MTrP- Criteria Simon et al 1999), between the age group of 25-50 years, both genders, having pain of atleast 3 on VAS and currently not receiving any treatment were included in the study. Subjects with cervical, thoracic and shoulder degenerative pathology, cervical or thoracic spine surgeries, systemic diseases like Rheumatoid Arthritis, Tuberculosis, Recent H/O trauma to spine or neck shoulder region, previous H/O trigger point injections, Vertebro-basilar insufficiency, malignancy, sensory deficits and psychological disorders were excluded.

After obtaining the Institutional Ethical Committee approval, the subjects with latent trigger points who met the inclusion criteria were enrolled in the study. After a detailed history and examination, the study procedure was explained to the subjects and a written informed consent was obtained from them.

Outcome measures and instrumentation

The outcome measures were visual analogue scale (VAS) assessing local pain elicited by 2.5kg/cm² of pressure applied with an algometer on the MTrP and cervical lateral flexion ROM with a goniometer. These outcomes were assessed by an examiner blinded to the treatment allocation of the subject. The pressure algometer consisted of a rubber disk with 1cm² surface. The rubber disc is connected to a pressure pole, which inserts into a gauge which records the pressure in

kilograms. The VAS is an instrument that has been widely used to quantify the intensity of pain. The patient placed a vertical mark on a continuous 10cm line to indicate his/her pain, ranging from no pain or discomfort (0), to the worst pain you could possibly feel (10). The reliability and validity of the VAS as a measure of pain has been established previously.^[19] The cervical lateral flexion ROM was assessed using 360° universal goniometer with the axis kept at external occipital protuberance and stationary arm along the cervical spine and movable arm in line with the stationary arm.

Procedure

The examination of MTrP was performed by localizing a tender point in the taut band of upper fibres of trapezius and the point was marked with a felt-tip pen. Pre-treatment measurement of pain on VAS and cervical ROM was recorded. The subjects were divided into two groups randomly through chit-block method. One group received Kinesiotaping while the other group received Cyriax transverse friction massage. Post readings for pain and cervical lateral flexion ROM was recorded after two minutes of each of the technique. The recordings were assessor blinded.

Kinesiotaping was applied as a Space tape method.(Fig. 1). Mode of action of space-tape is that it provides selective lifting of the skin and thus brings about a loosening of adhesions in the layers of tissue. The Star-shaped application is described by the patient as a kind of suction effect with clearly noticeable lifting of the adhered structure. The space tape provides more space for the damaged structure and leads to pain reduction.^[20]



Fig: 1. Space tape technique of Kinesiotaping for Upper fibres of trapezius

Cyriax transverse friction massage was applied with forefinger and reinforced with middle finger.(Fig. 2). The technique was executed with the muscle in relaxed supine position^[21] and was applied for 3 minutes. Friction was applied slowly with a pressure slightly painful, approximately at the pressure pain threshold level of each patient.



Fig: 2. Cyriax Transverse Friction Massage in Supine position

The data was analyzed using SPSS version 6.1. Mean and standard deviations of values were calculated for each variable. Baseline parameters were compared between groups using the independent t-test to assess the comparability of the two groups and within group differences were assessed with dependent t-test. Inter-group comparisons between both the study groups were also achieved with the independent t-test. The statistical analysis was conducted at 95% confidence interval. A p-value less than 0.05 was considered as statistically significant.

RESULTS

A sample of 120 clerical subjects, using computers for atleast five years, demonstrating latent trigger points in the upper fibres of trapezius, satisfying the enrollment criteria were included. At the beginning of the study, no significant differences were found between the groups for gender ($p=0.5$), age ($p=0.7$), VAS score at rest ($p=0.938$) and lateral flexion cervical range of motion ($p=0.686$). Thus, it could be assumed that the two groups were comparable for all the baseline parameters at the start of the study. Baseline data of each group are given in table 1.

The results showed statistically significant decrease in the VAS. The pain reduced from a mean of 6.10 ± 1.90 to 4.20 ± 2.09 with taping and from 6.13 ± 1.07 to 2.96 ± 1.67 with transverse friction massage. (p value < 0.001) An independent t-test revealed statistically significant difference in decrease in pain of 3.17 ± 0.6 on VAS score with Cyriax transverse friction massage as compared to VAS score of 1.9 ± 0.19 with Kinesiotaping. ($p=0.014$) Thus between group comparison revealed improved pain reduction with Cyriax transverse friction massage as compared to Kinesiotaping. ($p=0.014$).

Both the groups showed significant increase in ROM ($p < 0.001$) within each group. Also, between group comparison showed that both the groups were equally effective in improving the ROM. ($p=0.3$).

The pre-post scores comparisons of within group and between group are given in Table 2.

Table 1: Shows baseline data of each group.

Baseline Characteristics of both groups.		
Group	Kinesiotaping	Cyriax transverse friction
Number of cases	60	60
Gender (Male/Female)	36/24	35/25
Age (X $\pm$ SD)	40.66 $\pm$ 7.54 years	40.0 $\pm$ 5.84
VAS pre treatment	6.1 $\pm$ 1.90	6.13 $\pm$ 1.07
Lat Flex ROM pre treatment	33.53 $\pm$ 5.02	34.06 $\pm$ 5.14

M=Male; F=Female; X=Mean; SD=Standard deviation; VAS=Visual analogue scale (expressed in centimetres); ROM= Range of motion

Table 2: Summarizes the within group pre-post scores and between groups comparisons with their p values.

Groups	Pre-treatment data (X $\pm$ SD)		Post-treatment data (X $\pm$ SD)		p value within group		Pre-post treatment diff data (X $\pm$ SD)	
	VAS	ROM	VAS	ROM	VAS	ROM	VAS	ROM
Kinesiotaping	6.10 $\pm$ 1.90	33.53 $\pm$ 5.029	4.20 $\pm$ 2.09	37.23 $\pm$ 4.30	<0.001 (HS)	< 0.001 (HS)	1.9 $\pm$ 0.19	3.7 $\pm$ 0.72
Cyriax transverse friction massage	6.13 $\pm$ 1.07	34.06 $\pm$ 5.14	2.96 $\pm$ 1.67	38.36 $\pm$ 4.14	< 0.001 (HS)	< 0.001 (HS)	3.17 $\pm$ 0.6	4.3 $\pm$ 1.0
p value between group							p=0.014(S)	p=0.3(NS)

X=Mean; SD=Standard deviation; VAS=Visual analogue scale (expressed in centimetres); ROM= Range of motion(expressed in degrees), HS= Highly significant; S=Significant; NS=Non-Significant.

DISCUSSION

The present study demonstrated that the myofascial trigger point tenderness decreased in response to both Kinesiotaping and Cyriax transverse friction massage. Both the groups obtained a similar increase in the range of motion and a similar decrease in the pain on VAS.

Precise mechanism which explains the effect of Kinesiotaping on musculoskeletal pain is not yet fully understood. There are a number of hypotheses indicating a probable analgesic action of Kinesiotaping. The gate control theory seems to be the most fundamental approach, in which the cutaneous stretch stimulation, activated by Kinesiotaping, can interfere nociceptive stimuli reaching the central nervous system and inhibit the pain.^[14]

Probable Mechanism of Kinesiotaping method for MTrPs can be explained with the hypothesis proposed by Kase about the space, movement, and cooling effect of taping. Taping lifts the skin to increase space between skin and muscle reducing the localized pressure, promoting circulation and lymphatic drainage. This theoretically reduces pain, swelling, and muscle spasm.^[22-24] Pain sensation can be diminished due to reduction of the pressure on nociceptors, therefore we hypothesize that Kinesiotaping method can block the vicious circle of energy crisis.^[23] The use of kinesio tape to treat trigger points is known to unload the affected soft tissues by inhibiting the overactive muscle, changing the orientation of the fascia and a proprioceptive effect.^[11] Enhanced proprioception through increased stimulation to cutaneous mechanoreceptors is helpful in restoring muscle function in patients with myofascial trigger points.^[11] Our results are quite consistent with that of Soares 2013 and Fahimeh Hashe Mirad 2013.

The reduction in pain with Cyriax transverse friction massage can be attributed to the hypothesis that deep massage offers effective stretching and mobilization to the taut band. Results of the present study are quite consistent with that of Cesar Fernandez-de-las-penas.^[17] Pain relief during and after DTF may be due to modulation of the nociceptive impulses at the level of the spinal cord: the “gate control theory”. The centripetal projection into the dorsal horn of the spinal cord from the nociceptive receptor system is inhibited by the concurrent activity of the mechanoreceptors located in the same tissues.^[25, 26]

There is evidence that there is a sustained contraction of muscle sarcomeres from excessive release of Acetylcholine in MTrP which compresses local blood supply restricting the energy needs of the local region. This crisis of energy produces sensitizing substances that interact with some nociceptive (pain) nerves traversing in the local region which in turn produces localized pain within the muscle. The probable physiological reason for getting pain relief with transverse friction massage could be that it produces vasodilatation and increased blood

flow to the area, thus combating the local ischaemia. This may facilitate the removal of chemical irritants and increase the transportation of endogenous opiates, resulting in a decrease in pain.^[25-27]

Transverse friction massage also leads to increased destruction of pain provoking metabolites, such as Lewis's substances. This metabolite, if present in too high a concentration, causes ischaemia and pain.^[21]

On comparing the two groups, the Cyriax transverse friction massage group experienced a greater reduction in pain with mean VAS after taping. It is a common clinical observation that application of TFM leads to immediate pain relief because the patient experiences a numbing effect during the session and reassessment immediately after shows reduction in pain and increase in strength and mobility.^[28]

An equal response for improving range of motion was observed in both the treatment groups. It is postulated that Kinesiotaping influences facial tissue and the direct contact between the fascia and the muscle structures suggests that it can take part in transmitting the relative tensioning to proper receptors, thus eliciting the muscle response. There also exists a possibility that the improved motion might have been due to an increase in the number of motor units recruited to perform the activity due to an increase in the proprioceptive stimulus.

The improved ROM due to Cyriax massage can be attributed to the fact that it helps in releasing the taut bands within the muscle, thereby improving muscle length and thus the ROM can be returned to original status.^[29]

A fewer limitations exists in our study. Allocation to the treatment modality was done by randomization. A stronger design could include a third group undergoing a sham control intervention, which may then demonstrate that both the treatments were better than sham intervention. Moreover, this study was limited to an immediate effect. Further studies are needed to examine long term effects of these techniques. We did not carry out a formal sample size calculation. We felt the need that functional outcome measures could have been included.

CONCLUSION

The present study demonstrated that myofascial trigger point tenderness decreased in response to both Kinesiotaping and Cyriax transverse friction massage. Cyriax transverse friction massage was more effective in reducing pain as compared to Kinesiotaping. Both modalities of treatment were equally effective in increasing the ROM.

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