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"Short Term Effect Of Space Correction Taping Technique Versus Ischemic Compression On Pain, Rom & Function In College Going Students With Upper Trapezius Myofascial Trigger Point – A Comparative Study."

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I. BACKGROUND:

Since Upper Trapezius muscle is constantly working against the gravity to maintain erect head & neck position the muscle develops trigger points. The most common site where trigger points & bands are formed is Upper Trapezius muscle. So the purpose of this study was to find which technique among IC & K taping is more effective to reduce pain, ROM & function in subjects having Upper Trapezius trigger points.

AIM: To see the Short term effect of Space correction taping technique versus Ischemic compression on Pain, ROM & Function in college going students with Upper Trapezius myofascial trigger points.

METHODOLOGY: Subjects were selected by using simple random sampling. 34 subjects were selected by Inclusion criteria. Subjects were evaluated for UT TPs by NPRS & ROM. Subjects got treatment for 2 weeks with 3 days interval. Patch test was done for the subjects who got KT treatment. KT was applied on Trigger point and left for 3 days & changed on 4th day. For subjects who got IC treatment continuous pressure was applied over the trigger point with thumb for 30 sec. The procedure was repeated 5 times per session with 10 sec rest in between.

RESULT: Significant Short term effect were seen in both the groups with no major difference in any of the technique.

CONCLUSION : Our studies showed there is similar short term effect between both the techniques but no significant difference.

Clinical Implication : According to the therapist both the techniques can be used alternatively for trigger points in clinical practice as both techniques almost show similar Short term effects.

INTRODUCTION

Myofascial pain syndrome(MPS) is a musculoskeletal pain syndrome characterized by trigger points(TPs) in muscle, fascia or tendinous insertion areas and pain radiating to reference areas with palpation of these points.[9]
The presence of myofascial trigger points(MTrPS) is the most common cause of musculoskeletal problems and leads to limited professional activity.[1]
Trigger points are hyperirritable spots found in tense skeletal muscle bands which may lead to muscle dysfunction and thus limiting work and leisure activities. The spot is painful on compression and gives rise to characteristics like pain , tenderness , muscle dysfunction(weakness, fatigue, stiffness and poor blood flow), restricted ROM, change of motor pattern, poor posture and limited physical, professional and social activity.[3]

In Upper Trapezius (UT) muscle is it is constantly working against gravity to maintain an erect head and neck position.[4] There are two types of MTrPS : Latent and Active. Latent MTrPS cause local and referred pain with palpitation and Active MTrPS cause pain at rest and on palpation (spontaneous pain)[1][3][5]
Upper Trapezius(UT) muscle is the muscle in which MTrPS occur very often and this commonly found at midpoint of upper border of the upper trapizus .[3] [7]
The reason that MTrPS most commonly found
It leads to restriction of neck lateral flexion away from the involved side.[4]

The estimated incidence of neck pain in one year ranges from 10.4% to 23.3%.
Prevalence ranges from 0.4% to 86.8% in which higher incidence in noted in office workers, computers users, mobile users of age 20-40 years.[5]
Various approaches can be used in management of MTrPS. These include exercise, massage, patient education, medical treatment, laser, ultrasound, dry needling, corticosteroids, botulinum toxin, MFR, and TENS.[3][4]
In regions of myofascial trigger points, with reduced blood supply and muscle spasm nociceptors can also be affected by various inflammatory and fascial contractures. Few studies related to kinesiotaping which is used in sport injuries and postoperative complications is added to armamentarium for management of MTrPS.[2]
The mechanism of Kinesiotaping (KT) is it increases the subcutaneous space between the skin and soft tissues to facilitate blood circulation and to remove inflammatory substances and decrease pressure on nociceptors.
In addition to increasing space in soft tissue under the skin somatosensory, proprioceptive stimulation, Golgi tendon organ stimulation, restriction of movement, and placebo effect have been suggested as mechanisms of pain relief.
Space Correction Taping technique in addition to normal K taping creates more space between skin and soft tissue.
There are four strips of “I” shape placed directly over the area of pain in star shape. They are stretched 50% of their available tension.[1]{2}[3][4]

Ischemic compression is the technique in which therapist uses pincer grasp, placing thumb and index finger over the trigger point
until thumb nail color changes to white. Hold this for 30 seconds.
People with trigger point with their symptoms can be explained by energy crisis theory. According to the theory, a sustained contractile activity of sarcomeres increases metabolic demand and squeezes the rich capillaries network that supply the nutritional and oxygen needs of that region and decreased blood flow in the muscle at the site of latent trigger point.

This causes the energy crisis and local hypoxia and tissue crisis stimulate vasoreactive substances which produce local nociceptors causing pain.

When Ischemic compression is used on trigger points the local chemistry changes. There is blanching of the nodules with hyperemia when compression is released. This pushes out muscle inflammatory exudates and pain metabolites, breaks down scar tissue, desensitizes nerve endings and reduce muscle tone.

Thus (IC) Ischemic Compression has same mechanism as injection therapy but it is non invasive technique**.**[5][6][7]

MATERIALS & METHODOLOGY

The present study was conducted in Miraj at College of physiotherapy Wanless Hospital 2023-24. Study protocol was reviewed & approved by ethical committee of Miraj center's College of Physiotherapy, Wanless Hospital. 34 subjects participated in this study. All participants gave written conscent form.

INCLUSION CRITERIA:

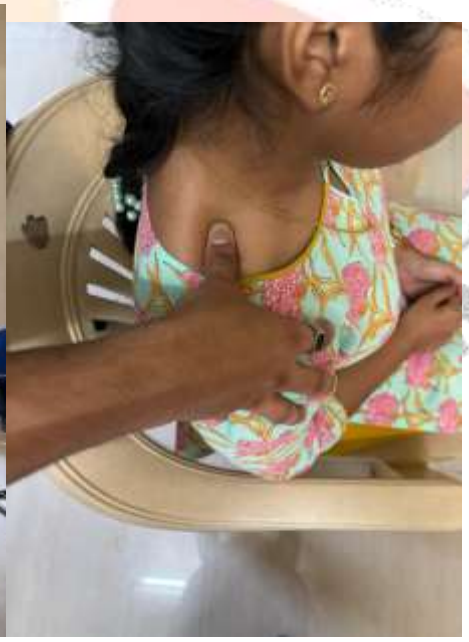
- Participants of the age group between 18- 30 years, both males and females
- Presence of tender point in that taut band in upper trapezius region
- Pain in upper trapezius region and on active trigger point palpation pain radiating to back of the shoulder, arm and the back
- Jump sign is present which is characterized by patient vocalization, withdrawal or wincing of face
- Painful restriction of cervical lateral flexion – pain score more than 4 on numerical rating scale(NRS-11)
- Patient with at lease one active TrPs localized in unilateral trapezius muscle.

EXCLUSION CRITERIA:

- History of orthopedic surgery to neck or back in past 6 months
- Neurological conditions
- History of any neck or upper back pathologies
- Clotting disorders
- Treatment of myofascial pain or trigger point at time of the study
- Scoliosis/kyphosis
- Open wounds
- Pregnancy
- Tumours

- Fibromyalgia
- Active rheumatic disease
- Systemic disease(diabetes, hypothyroidism, infection, malignancy)
- Skin allergies
- Torticolis
- Cervicogenic headache

- **PRTOCOL: ISCHEMIC COMPRESSION TECHNIQUE:**
- Ask patient to sit in the chair with upper back bare without any clothing, ornaments and hairs should be shaved.
- Therapist palpates the trigger point with his thumb or index finger.
- While doing Ischemic compression a sustained stretch should be applied for 30 seconds with simultaneous applying pressure over the trigger point with thumb or index finger.
- 10 seconds rest will be given and this procedure will be repeated 5 times per session.



SPACE CORRECTION TAPING TECHNIQUE:

- First a patch test was done on the subjects to conclude if patient has any skin allergy to any substance.
- Before applying the tape to the area look if hairs are present. If present shave them towards the direction of hair growth and not to the opposite direction as hair folliciles can cause irritation when the tape is applied. After shaving wash the area properly and dry it so there is no presence of moisture present.
- Patient sleeps in prone lying position or can sit as per patients comfort with his upper back without any clothes, ornaments and hairs should be shaved if present.
- Therapist palpates the trigger point with his index finger or thumb.
- Ask patient to do side flexion at opposite side so the muscle gets stretched and then apply the Kinesio tape.
- This was done for 2 weeks with 3 days interval.

STATISTICAL ANALYSIS AND RESULTS

Data analysis was performed using the level of significance of NPRS and ROM for upper trapezius myofascial trigger point was measured using paired t test and unpaired t test.

IC – Paired t-test was done to compare values within the group, pre-treatment and post-treatment values.

Space Correction Taping – Paired t-test was done to compare values within the group, pre-treatment and post-treatment values

Both the groups – Unpaired t-test was done to compare values between the groups, pre-treatment and post-treatment values of both groups with each other.

Fig.1: Distribution of gender in both the groups

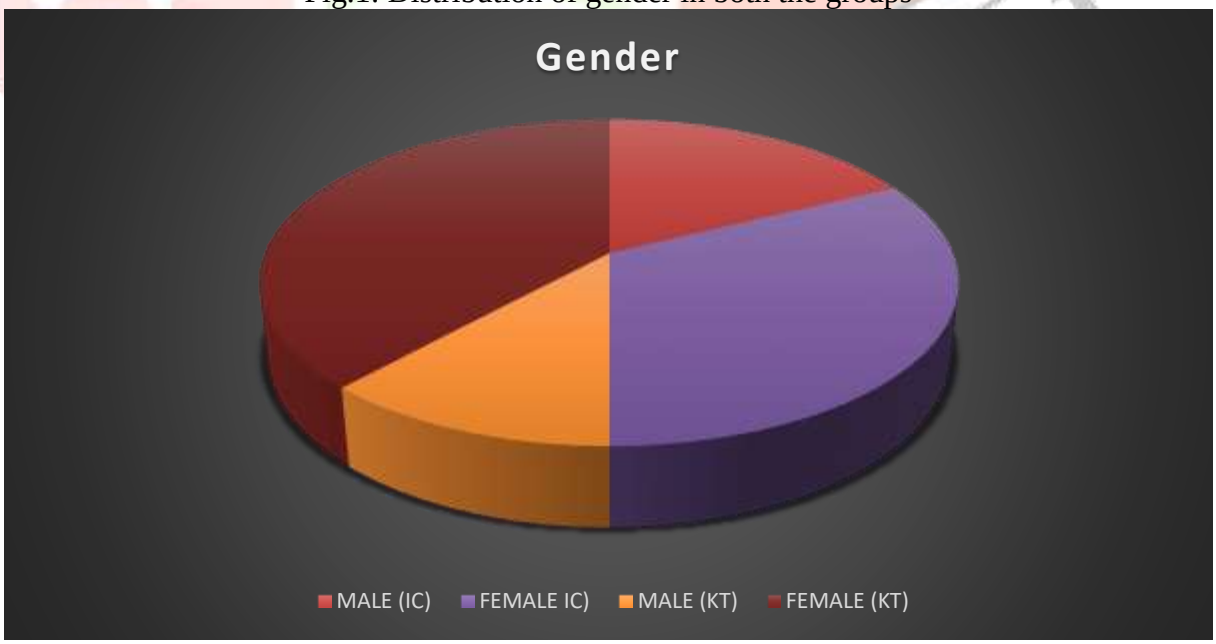


Fig.2: Distribution of sides of subjects in both groups

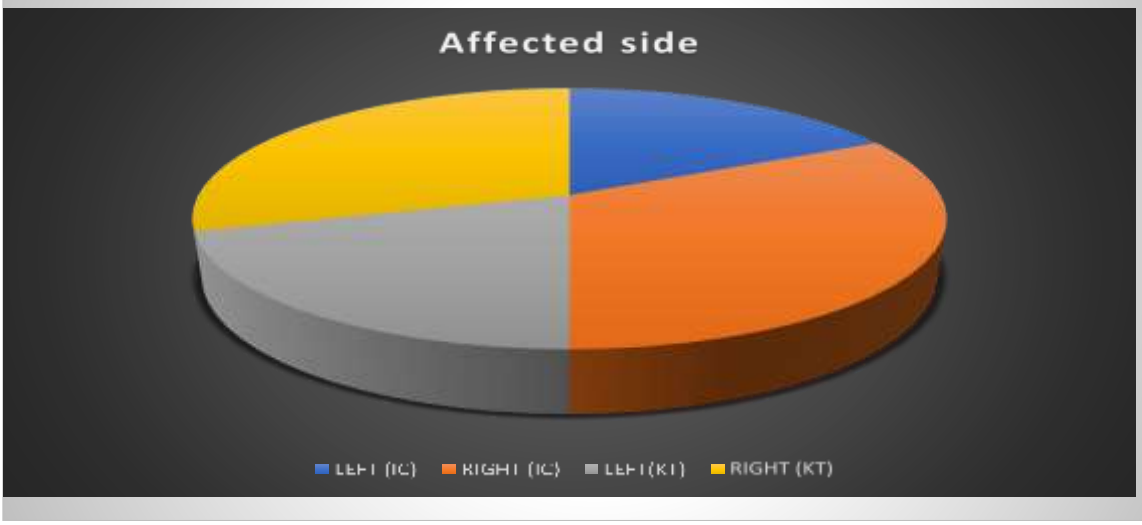


Table.1: Comparison of means values of NPRS in pre and post treatment

Group	Pre-Treatment	Post treatment
IC	8.23	3.82
K Taping	7.41	3.41

Fig.3: Comparison of means values of NPRS in pre and post treatment

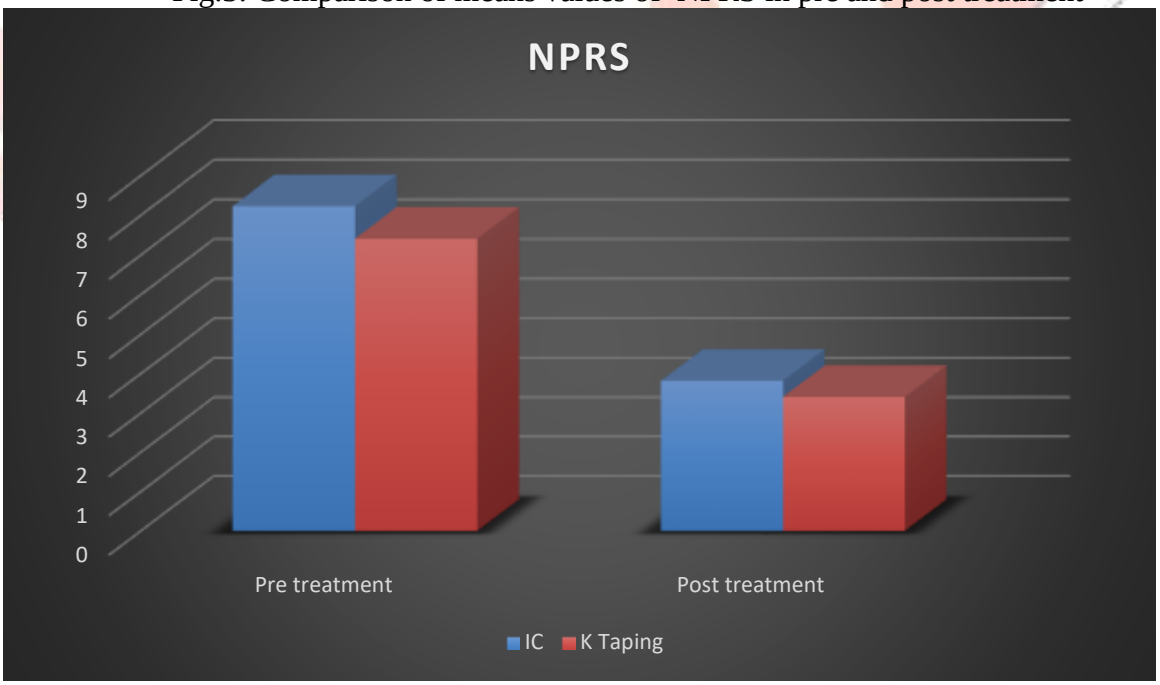


Table.2: Comparison of means values of ROM in pre and post treatment

Group	Pre-Treatment	Post Treatment
IC	27.29	48.35
K Taping	25.76	45.23

Fig.4: Comparison of means values of ROM in pre and post treatment

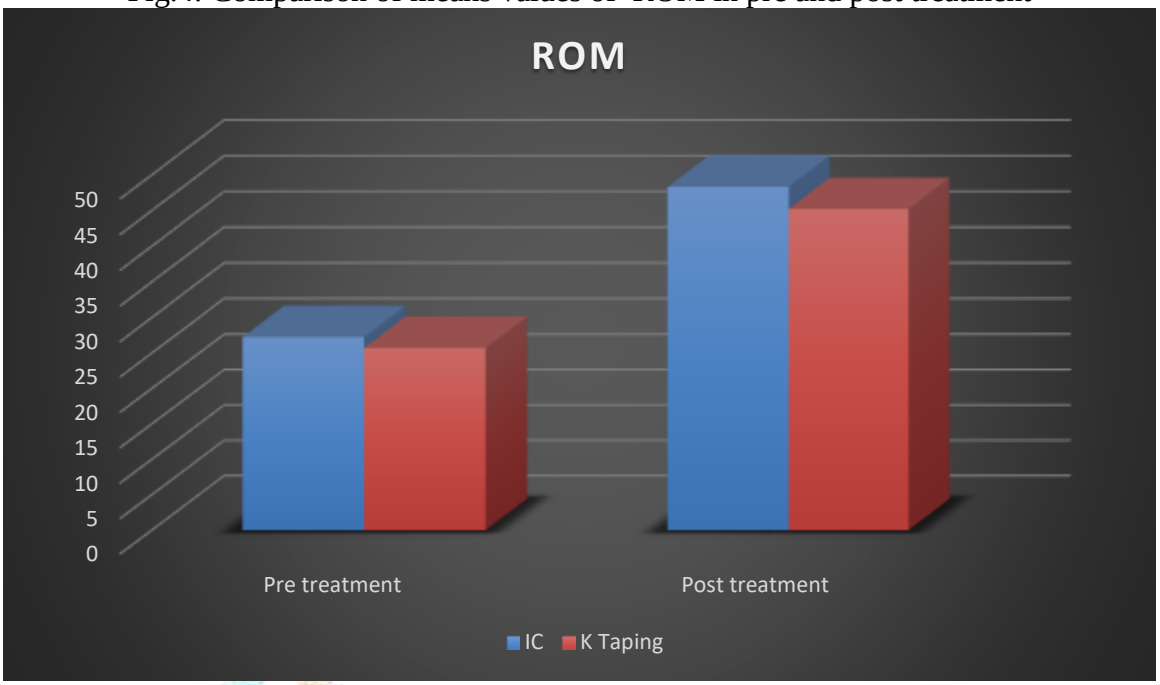


Table 3: Descriptive statistics of subjects receiving IC and K Taping techniques measured by NPRS and ROM and its comparison between pre and post treatment using paired t test.

Group	Outcome Measure	N	Mean	Std. Deviation	t value	P value
IC	Pre NPRS	17	8.23	0.83	25.53	<0.0001
	Post NPRS	17	3.82	1.07		
	Pre ROM	17	27.29	6.82	12.18	<0.0001
	Post ROM	17	48.35	9.07		
K Taping	Pre NPRS	17	7.41	1.66	13.46	<0.0001
	Post NPRS	17	3.411	1.06		
	Pre ROM	17	25.76	9.41	9.91	<0.0001
	Post ROM	17	45.23	9.22		

Paired t test was done to compare within IC and K Taping groups in students with Upper trapezius myofascial trigger point with NPRS and ROM as the outcome measure.
It was found that:
Mean post-treatment NPRS score of subjects receiving IC technique was 3.82 which was significantly less than mean pre-treatment NPRS score of subjects receiving IC technique which was 8.23 ($p<0.0001$)
Mean post-treatment NPRS score of subjects receiving K Taping was 3.41 which was significantly less than mean pre-treatment NPRS score of subjects receiving K Taping which was 7.41($p<0.0001$)
Mean post-treatment ROM score of subjects receiving IC technique was 48.38 which was significantly higher than mean pre-treatment ROM score of subjects receiving IC technique which was27.29 ($p<0.0001$)
Mean post-treatment ROM score of subjects receiving IC technique was 45.23 which was significantly higher than mean pre-treatment ROM score of subjects receiving K Taping which was 25.76 ($p<0.0001$)

Hypothesis
There is significant short-term effect of Space correction taping technique on Pain, ROM in patients with Upper trapezius myofascial trigger point
There is significant short-term effect of Ischemic Compression on Pain, ROM in patients with Upper trapezius myofascial trigger point

Table 4: De scriptive statistics of subjects receiving IC and K taping techniques measured by NPRS and ROM and its comparison between groups using unpaired t test.

Outcome Measure	Group	N	Mean	Std. Deviation	t value	P value
Pre NPRS	IC	17	8.23	0.83	1.82	0.076
	K Taping	17	7.41	1.66		
Post NPRS	IC	17	3.82	1.07	1.12	0.269
	K Taping	17	3.41	1.06		
Pre ROM	IC	17	27.29	6.82	0.54	0.591
	K Taping	17	25.76	9.41		
Post ROM	IC	17	48.35	9.07	0.99	0.328
	K Taping	17	45.23	9.22		

Unpaired t test was done to compare between IC and Space Correction Taping groups in students with Upper trapezius myofascial trigger point with NPRS and ROM as the outcome measure.

It was found that:

Mean pre-treatment NPRS score of subjects receiving IC was 8.23 and mean pre-treatment NPRS score of subjects receiving Space Correction Taping was 7.41.

Mean post-treatment NPRS score of subjects receiving IC was 3.82 and mean post-treatment NPRS score of subjects receiving Space Correction Taping was 3.41.

Mean pre-treatment ROM score of subjects receiving IC was 27.29 and mean pre-treatment ROM score of subjects receiving Space Correction Taping was 25.76.

Mean post-treatment ROM score of subjects receiving IC was 48.35 and mean post-treatment ROM score of subjects receiving Space Correction Taping was 45.23.

Hypothesis

There is no significant short-term difference between Space correction taping technique compared with Ischemic Compression(IC) on Pain, ROM and function in patients with Upper trapezius myofascial trigger point

CONCLUSION: The study has shown that there is similar short term effect between both the techniques but no significant difference.

CLINICAL IMPLICATION : These techniques can be used alternatively in clinical practice as both the techniques show similar short term effect on pain, ROM & function on trigger points.

LIMITATIONS AND SUGGESTIONS*1.* Long term effects of both the techniques can be studied in future

2Number of subjects can be increased

3Study can be done in other number of population like desktop workers, etc.

4Number of subject were limited

5Subjects having allergy by K Tape were excluded

6Age group can be varied

DISCUSSION

The purpose of this study was to compare the effectiveness of Ischemic Compression & Space correction taping technique on Upper trapezius trigger point on college going students. In this study Pre & Post treatment were analysed. It was statistically proven that both the techniques show reduce in Pain, increase in ROM. IC was slightly better technique than K-Tape. Hence there was no significant short term difference between Space correction taping technique compared with IC on Pain, ROM & function in college going students with upper trapezius myofascial trigger point.

34 subjects were recruited in study according to inclusion & exclusion criteria. They were divided into 2 groups 17 of each by simple random sampling technique. Patch test was done prior to the subjects who were in K-Taping group. Procedure was told to the subjects.

The intervention was carried for 2 weeks with 3 days interval in between. The mean of Pre & Post values were compared using a paired T test for intra-group result & an Unpaired T test for inter-group result. The results were found extremely significant within the groups (<0.0001 & <0.0001) respectively & significance between the groups suggesting both groups show significant treatment effects.

Space correction taping technique increases the subcutaneous space between skin & soft tissue to increase blood flow & remove inflammatory substances & decrease pressure on nocioceptors. Hence stimulating somatosensory, proprioceptive & golgi tendon organ.

In IC technique there is blanching of nodules with hyperaemia after compression is released. This pushes out muscle inflammatory exudates & pain metabolites , desensitizes nerve endings & decrease muscle tone.

- Egle Lendraitiene, Dovile Bagdonaite et.al.(2017)

The purpose of this study was to relieve pain and increase ROM in patients with Latent Myofascial Trigger Points with the help of different physical therapy techniques like Ischemic Compression and Kinesiotaping was used. In this study included 27 volunteers without any health problems 19 were females and 8 males. Subjects were divided into 2 groups in which first group received Ischemic Compression which was applied to 11 women

and 4 men. In group 2 Ktaping was applied to 8 women and 4 men who had at least 1 trigger point. Study was done for 1 week and conclusion was Ischemic compression proved more effective technique than taping in reducing pain in latent myofascial trigger points.

- Yolanda Noguera-Iturbe, Javier Martinez- Gramage et.al.(2019)

The purpose of the study was to evaluate the immediate and short term efficiency of space correction KT technique in patients with latent and active MTrPS in upper trapezius muscle. Two trials were made in which group A **97** participants with latent MTrPS were assigned to KT and sham group. In second trail 37 participants with active MTrPS were assigned to KT and sham group. Primary outcome was (PPT) pressure pain threshold and secondary outcome was active range of motion. Conclusion was space correction taping technique alters PPT and improve AROM. This technique does provide evidence for its use in treating patient with active or latent UT trigger point.

- Pragnya Ravichandran, Karthika Ponni, Antony Leo Aseer(2016)

The purpose of this study was to see effect of Ischemic Compression on myofascial trigger point in neck pain. 30 subjects were included and allotted into 2 groups. Parameters were pain using VAS, PPT and ROM. Study group received Ischemic compression with stretching and controlled group received ultrasound of 1.4W/cm2. Both received cryotherapy post session. Study was done for 2 weeks and conclusion was ROM was improved in study group.

- Bhavesh Jagad, Karishma Jagad(2013)

The purpose of this study was to see effects of Ischemic Compression on trigger points in upper trapezius muscle. 30 subjects were assigned and were divided into 2 groups treatment and control groups. Treatment group received Ischemic Compression on trigger point followed with stretching of upper trapezius muscle. Control group neck exercises and stretching. Treatment was given for 7 days.PPT and VAS was recorded on day 1 and day 8.Conclusion was Ischemic Compression was highly effective in reducing trigger point sensitivity and pain in trapezius muscle.

Hence seeing the previous studies both K Taping & IC were effective on trigger point, hence the 2 techniques were chosen for the study. Hence this study concludes both Space correction taping technique & IC show almost similar effectiveness on UT TPs with IC having a slight upper hand to reduce Pain , increase ROM & function**.**

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