International Journal of Orthopaedics and Physiotherapy
www.orthopedicsjournals.com
Online ISSN: 2664-8997, Print ISSN: 2664-8989
Received: 02-10-2021, Accepted: 15-10-2021, Published: 30-10-2021
Volume 3, Issue 1, 2021, Page No. 4-7

Immediate effect of kinesio tapping V.S ischaemic compression on myofascial trigger points of trapezius muscle

Disha Assudani[1], Clevio Desouza[2*], Tushar Palekar[1]
[1] Dr. D.Y. Patil College of Physiotherapy, Pune, Maharashtra, India
[2] Department of Orthopaedics, Holy Spirit Hospital, Mumbai, Maharashtra, India

DOI: https://doi.org/10.33545/26648989.2021.v3.i1a.12

Abstract
Introduction: Myofascial pain syndrome is the most common cause of myofascial pain which is mainly due to myofascial trigger points. The myofascial trigger points are spots of hyperirritability located in the muscle as a taut band which on palpation or compression is tender and has referral pain. Some studies state that trigger points may form as a result from or be irritated by overuse, faulty posture, trauma, mechanical over load or psychological stress. We in our study have aimed to compare the immediate effect of Kinesio tapping with Ischaemic compression on trigger points in trapezius muscle.
Materials and Methods: 30 subjects were included in the study, which were divided in Group A (Kinesio Taping) and Group B (Ischemic Compression). Outcome measure was assessed on the basis of NPRS and Cervical Spine ROM based on Pre and Post procedure readings according to the respective groups.
Conclusion: Kinesio tapping and ischemic compression both treatment are effective individually to relive pain and increase lateral flexion range of cervical spine and work effectively on different individuals to get the same result.

Keywords: myofascial pain, trigger points, kinesio taping, ischemic compression

Introduction

Myofascial pain syndrome is the most common cause of myofascial pain which is mainly due to myofascial trigger points. The myofascial trigger points are spots of hyperirritability located in the muscle as a taut band which on palpation or compression is tender and has referral pain [1, 2]. Some studies state that trigger points may form as a result from or be irritated by overuse, faulty posture, trauma, mechanical over load or psychological stress [2].

The trigger points are divided into primary, secondary, satellite, active and latent trigger points. Active trigger points are those which cause pain at rest or with activity of the particular muscle having the trigger point. Active trigger when palpated or compressed cause referral pain. Latent trigger point according to travel and Simons does not cause pain at rest but cause restricted range of motion and weakness of the particular muscle, cause of which people do not realise that they have latent trigger points [2, 3]. Latent trigger points may become active if the trigger is permanently [3]. The most common muscle which develop myofascial trigger points are upper trapezius, scalene, Sternocleidomastoid and levator scapulae. The trapezius muscle is the most common site for trigger points. The upper fibres of the trapezius muscle in particular are mostly affected by the myofascial trigger points in the cervical region. Taut and painful muscle, headache, dizziness, neck pain, vertigo, limited ranges are the common patterns in people with trigger in upper trapezius muscle [1]. Studies have shown that the trapezius motor control pattern is altered in the shoulder isometric exercise [4]. The shoulder and the scapula regions including the upper trapezius muscle developed myofascial pain syndrome most commonly [5].

The response of local inflammation which is cause by the myofascial trigger points can negatively affect the surrounding soft tissue, resulting in impairment of the entire muscle and the fascia. These negative effects can further be transferred, through the myofascial chain, to distant tissues, including the referred pain that is the main characteristic of the MPS. The presence of the Myofascial trigger points is therefore considered to be the first sign of overloading of a muscle [5]. Muscle overload is thought to be the result of sustained or repetitive low-level muscle contraction, eccentric muscle contraction, and maximal and submaximal concentric muscle contraction. Although muscle damage is not required for the development of trigger points, there may be a disruption of the cell membrane, damage to the sarcoplasmic reticulum with a subsequent release of high amounts of calcium ions and disruption of cytoskeletal proteins such as desmin, titin and dystrophin. Ragged red fibres and increased numbers of cytochrome c-oxidase negative fibres are common in patient's myalgia, which are suggestive of an impaired oxidative metabolism [6].

There are various invasive and non-invasive treatment approach for the treatment of the myofascial trigger points in the upper trapezius, such as dry needling, ischemic compression, kinesio taping, spray and stretching, ultrasound, deep heat thermotherapy, MET, laser, ice, deep friction massage [2, 4]. Kinesio taping (KT) is a non-invasive treatment approach to treat myofascial trigger points. KT was developed in 1970 by a Japanese chiropractor, Kenzo Kase. It is an adhesive tape, having unique stretchable and non-allergenic properties. It is easily worn on skin without restricting the muscle movement. KT is made up of thin elastic adhesive material that can be stretched up to 120-140% of its resting length providing a dynamic flexible tape that can stimulate the human skin. KT treatment is based on lifting the skin from the soft tissue beneath which increases the space between the skin and muscle which helps in 1) improving blood circulation by facilitating the muscle, 2)

increasing the local circulation 3) reducing local oedema by reducing exudative substance, 4) giving proper afferent input to the CNS, 5) providing a positional stimulus to the skin, muscle or facial structure. The KT includes facilitation, inhibition, corrects fascia, field and functional correction and mechanic correction technique [1, 7, 8, 9].

Ischemic compression is a manual therapy technique that uses vertical pressure on the trigger point [1]. Simon has proposed that local pressure tends to lengthen the sarcomere in the involved trigger point and reduces pain by change in the circulation perfusion of the skin and by decreasing the muscle tension and improving the range of motion. The pressure on the point has been shown to reduce the height of the sarcomere and causes concomitant lengthening of the sarcomere in the muscle fibre [1, 2]. It also suggests that IC could lead to normalization of biomechanical properties of the involved muscle fibre, restoring the normal function condition of the muscle and likely decrease the risk of injury [5]. The pressure applied is till the therapist feels relaxation of the involved area. It usually takes about 60sec, but recent studies suggest the compression may range from 60-90sec [3].

We in our study have aimed to compare the immediate effect of Kinesio tapping with Ischemic compression on trigger points in trapezius muscle.

Material and Methods

30 subjects were included in the study, which were divided in Group A (Kinesio Taping) and Group B (Ischemic Compression). All the subjects had signed an inform consent form prior to participation.

Inclusion criteria

1. Age of 18-25 years having neck/cervical pain lasting for three months at least
2. Having trigger points in upper trapezius fibres.

Trigger point was diagnosed as

1. Taut band within the muscle fibres.
2. Exquisite tenderness at a point in the band.
3. Reproduction of the patient's pain with referred pain.
4. Local twitch response or jump response.

Exclusion criteria

1. Pain due to trauma, whiplash injury, cervical disc prolapse, inflammation.
2. Any neurological or psychological condition.
3. Any congenital malformation.
4. Had any invasive therapies in the past 3 months.
5. Patients with sensory impairment, diabetic sensory neuropathy.
6. Hypersensitive skin/ allergies.

Outcome measures

1. NPRS
2. Cervical Spine Range of Motion

Procedure

30 participants who met the inclusion criteria were divided equally into two groups. Group A received kinesio taping and group B received Ischemic compression. NPRS and the cervical range of motion with the help of a goniometer were taken pre and post the treatment procedure. The upper trapezius was examined for the trigger points. The point which on pressure showed a jump sign or a local twitch response was selected for the treatment procedure respectively. The participants for both the treatment protocol were positioned in sitting position comfortably without any tension on the muscle. For group A, kinesio tape was used. The space correction technique was selected. The painful trigger point was selected; three I shape strips (length 8cm and width 2.5cm) were used. The tape was stretched from the middle to 50% stretch and was applied on the trigger point one above the other in star shape on the upper trapezius muscle. After the application of the tape the participant was asked to state the pain on the NPRS scale and the cervical range of motion was check with the goniometer. For Group B, ischaemic compression was used. The participants were seated in sitting position. The painful trigger point was selected; firm digital compression was applied to the trigger point until the participant reported pain intensity of 7-8 on the NPRS. To maintain the effectiveness of the ischemic compression the intensity was maintained during the application.

If the participants report decrease in the pain, the intensity was increased to 7-8 on the NPRS.

Ischemic compression was applied three times for 60 sec, with 10 sec break in between the compression. Post which the participant was ask to rate the pain on the NPRS scale and the cervical range of motion was taken with the goniometer.

Results

In group A mean value for pre NPRS was 6.467 and for post NPRS was 2.2 with P value of $p<0.000$; which is statistically significant (Table 1).

Table 1: Group A (Kinesio taping) NPRS

Group	Mean	Std dev	Sem
Pre	6.467	1.187	0.3065
Post	2.2	1.897	0.4899
Difference	4.267	1.944	0.5021

95% confidence interval for difference: 3.19 to 5.343
t = 8.498 with 14 degrees of freedom; P = 0.000

In group B mean value for pre NPRS was 7 and for post NPRS was 2.4 with P value of $p<0.000$; which is statistically significant (Table 2).

Table 2: Group b (IC) NPRS

Group	Mean	Std dev	Sem
PRE	7	1.309	0.3381
POST	2.4	1.183	0.3055
Difference	4.6	1.056	0.2726

95% confidence interval for difference: 4.015 to 5.185
t = 16.877 with 14 degrees of freedom; P = 0.000

In group A mean value for pre ROM was 35 and for post ROM was 40.33 with P value of $p<0.000$; which is statistically significant (Table 3).

Table 3: Group a rom

Group	mean	Std dev	Sem
PRE	35	7.071	1.826
POST	40.33	5.164	1.333
Difference	-5.333	4.419	1.141

95% confidence interval for difference: -7.78 to -2.886
t = -4.675 with 14 degrees of freedom; P = 0.000

In group B mean value for pre ROM was 30 and for post ROM was 34.33 with P value of p<0.007; which is statistically significant (Table 4).

Table 4: Group b rom

Group	Mean	Std dev	Sem
PRE	30	7.792	2.012
POST	34.33	6.51	1.681
Difference	-4.333	5.3	1.369

95% confidence interval for difference: -7.269 to -1.398
t = -3.166 with 14 degrees of freedom; P = 0.007

Unpaired t test

The t value of the pre values of group A and group B for NPRS was 1.169 and p value was0.252 this which is statistically not significant (Table 5).

Table 5: Pre NPRS of group a and group b

Group	Mean	Std dev	Sem
A	6.467	1.187	0.3065
B	7	1.309	0.3381
Difference	-0.5333	0.4563	

95% confidence interval for difference: -1.468 to 0.4015
t = -1.169 with 28 degrees of freedom; P = 0.252

Table 6: Post NPRS of group a and group b

Group	Mean	Std dev	Sem
A	2.2	1.897	0.4899
B	2.4	1.183	0.3055
Difference	-0.2	0.5774	

95% confidence interval for difference: -1.383 to 0.9826
t = -0.346 with 28 degrees of freedom; P = 0.732

The t value of the post values of group A and group B for NPRS was 0.346 and p value was 0.732this which is statistically not significant (Table 6).
The t value of the pre values of group A and group B for ROM was 1.840 and p value was 0.076this which is statistically not significant (Table 7).

Table 7: Pre rom of group a and group b.

Group	Mean	Std dev	Sem
A	35	7.071	1.826
B	30	7.792	2.012
Difference	5	2.717	

95% confidence interval for difference: -0.5651 to 10.57
t = 1.840 with 28 degrees of freedom; P = 0.076

The t value of the post values of group A and group B for ROM was 2.797 and p value was 0.009 this which is statistically significant (Table 8).

Table 8: Post rom of group a and group b

Group	Mean	Std dev	Sem
A	40.33	5.164	1.333
B	34.33	6.51	1.681
Difference	6	2.146	

95% confidence interval for difference: 1.605 to 10.39
t = 2.797 with 28 degrees of freedom; P = 0.009

Mean difference for the Pre and Post treatment findings for NPRS and ROM were as follows (Table 9).

Table 9: Mean difference for the pre and post treatment findings for NPRS and rom

GROUP(Rx)	Pre NPRS	Post NPRS	Mean difference
Group A (k taping)	6.467	2.2	4.267
Group B (IC)	7	2.4	4.6
GROUP(Rx)	**Pre ROM**	**Post ROM**	**Mean difference**
Group A (k taping)	35	40.33	5.33
Group B (IC)	30	34.33	4.33

Discussion

The current study compared two therapeutic clinical interventions for the individuals with myofascial trigger points in the upper trapezius muscle and the outcome measures (NPRS and the cervical range of motion) significantly improved post the treatment intervention. Kinesio tapping allowed a full range of motion for the applied muscle and joint with different pulling forces to the skin. Some studies state that the tape lifts the skin from the underneath muscle and increases the space between them, hence reducing the localized pressure and helps in promoting circulation and lymphatic drainage. The lesion site may contain bleeding, pressure and lymph fluid accumulation which may cause pain. After taping the space lifting mechanism helps drain the fluid. The inflammatory factors and the pressure is reduced and the movement of the muscle is improved, which results in reduction in pain, swelling and muscle spasm and increases range of motion [10]. Ischemic compression is directly related to increase blood flow. It induces transient local is chaemia and is followed by hyperaemic reperfusion after decompression. Increased blood flow resulted in washing out the inflammatory exudates from the muscles tissue which relieves pain and thus results in the treatment effects. A clinical trial done by Barbara Cagnie *et al* concluded that ischemic compression followed by stretching can be used as one of the early interventions in the treatment of Trapezitis [11]. A study conducted by Manuel Saavedra-Hernández *et al* concluded that patients with mechanical neck pain who received cervical thrust manipulation or Kinesio Taping exhibited similar reductions in neck pain intensity and disability and similar changes in active cervical range of motion [12]. Wei-Ting Wu, Chang-Zern Hong and Li-Wei Chou conducted a clinical trial on The Kinesio Taping Method for Myofascial Pain Control; the result considered that Kinesio Taping method could be applied as another choice of Myofascial trigger point therapy [10]. Nambi GS *et al* conducted a study on Difference in effect between ischemic compression and muscle energy technique on upper trapezius myofascial trigger points which suggested that Ischemic compression and Muscle energy technique may be effective in reducing pain, but for range of motion Muscle energy technique may be more effective than Ischemic compression in upper trapezius Myofascial Trigger point release to reduce pain and improve the range of motion [13]. Kim SA *et al* conducted a study on Ischemic Compression after Trigger Point Injection affecting the treatment of Myofascial Trigger Points and concluded that the effectiveness of ischemic compression for myofascial trigger point injections combined with ischemic compression shows better effects on treatment of myofascial trigger points in the upper trapezius muscle than the only trigger point injections therapy [14].

But the duration of ischemic compression did not affect treatment of myofascial trigger point.

Saavedra-Hernández M *et al* conducted a study on Short-Term Effects of Kinesio Taping Versus Cervical Thrust Manipulation in Patients with Mechanical Neck Pain and concluded that patients with mechanical neck pain who received cervical thrust manipulation or Kinesio Taping exhibited similar reductions in neck pain intensity and disability and similar changes in active cervical range of motion [12].

Ischemic compression and kinesio tapping both showed similar effect statistically and clinically in reduction of pain and improve lateral flexion of cervical spine.

Conclusion

Kinesio tapping and ischemic compression both treatment are effective individually to relive pain and increase lateral flexion range of cervical spine and work effectively on different individuals to get the same result.

However we would like to suggest that the duration for the application of tape can be increased. The therapy sitting can be increased, and functional limitations were not assessed in our study. Further studies can be done including the functional outcome and disabilities.

References

1. Shakeri H, Arab AM, Bargahi A. Immediate Effect of Kinesio Taping on Cervical Lateral Flexion Range of Motion in Subjects With Myofascial Trigger Point in Upper Trapezius Muscle. Physical Treatments,2016:5(4):231-236.
2. Ashfaque Khan, Abdur Raheem Khan. Comparative Effectiveness of Intigrated Neuromuscular Inhibition Techniques and Ischemic Compression Technique In Managing Upper Trapezius Myofascial Trigger Point Pain 1n Computer Professionals. Int J Recent Sci Res,2019:10(08):34269-34274.
3. Lendraitienė E, Bagdonaitė D, Petruševičienė D, Dudonienė V, Lendraitis V. The Effectiveness of Different Physical Therapy Techniques for Relieving Pain and Increasing Neck Range of Motion in Patients with Diagnosed Latent Myofascial Trigger Points. Orthop Muscular Syst,2017:6:246.
4. Sobhani V, Shamsoddini A, Khatibi-aghda A, Mazloum V, Hesari H, Kazem M *et al*. Differences Among Effectiveness of Dry Needling, Manual Therapy, and Kinesio Taping® Methods for the Management of Patients with Chronic Myofascial Neck Pain: A Single-Blind Clinical Trial. Trauma Mon,2017:22:1-8.
5. Kisilewicz A, Janusiak M, Szafraniec R, Smoter M, Ciszek B, Madeleine P, Fernández-de-Las-Peñas C *et al*. Changes in Muscle Stiffness of the Trapezius Muscle After Application of Ischemic Compression into Myofascial Trigger Points in Professional Basketball Players. J Hum Kinet,2018:15(64):35-45.
6. Bron C, Dommerholt JD. Etiology of myofascial trigger points. Curr Pain Headache Rep,2012:16(5):439-44. doi: 10.1007/s11916-012-0289-4.
7. Alotaibi M, Ayoub A, King T, Uddin S. The Effect of Kinesio Taping in Reducing Myofascial Pain Syndrome on the Upper Trapezius Muscle: A Systematic Review and Meta-Analysis. European Scientific Journal, ESJ,2018:14(6):336.
8. Öztürk G, Külcü DG, Mesci N, Şilte AD, Aydog E. Efficacy of kinesio tape application on pain and muscle strength in patients with myofascial pain syndrome: a placebo-controlled trial. J Phys Ther Sci,2016:28(4):1074-9.
9. González-Iglesias J, Fernández-de-Las-Peñas C, Cleland JA, Huijbregts P, Del Rosario Gutiérrez-Vega M. Short-term effects of cervical kinesio taping on pain and cervical range of motion in patients with acute whiplash injury: a randomized clinical trial. J Orthop Sports Phys Ther,2009:39(7):515-21.
10. Wei-Ting Wu1, Chang-Zern Hong2, Li-Wei Chou1, 3, 4. The Kinesio Taping Method for Myofascial Pain Control-Hindawi Publishing Corporation Evidence-Based Complementary and Alternative Medicine, 2015.
11. Barbara Cagnie, Vincent Dewitte, Iris Coppieters, Jessica Van Oosterwijck, Ann Cools, Lieven Danneels. Effect of Ischemic Compression on Trigger Points in the Neck and Shoulder Muscles in Office Workers: A Cohort Study, Journal of Manipulative and Physiological Therapeutics,2013:36(8):482-489.
12. Saavedra-Hernández M, Castro-Sánchez AM, Arroyo-Morales M, Cleland JA, Lara-Palomo IC, Fernández-de-Las-Peñas C. Short-term effects of kinesio taping versus cervical thrust manipulation in patients with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther,2012:42(8):724-30.
13. Nambi GS, Sharma R, Inbasekaran D, Vaghesiya A, Bhatt U. Difference in effect between ischemic compression and muscle energy technique on upper trepezius myofascial trigger points: Comparative study. Int J Health Allied Sci,2013:2:17-22.
14. Kim SA, Oh KY, Choi WH, Kim IK. Ischemic compression after trigger point injection affect the treatment of myofascial trigger points. Ann Rehabil Med,2013:37(4):541-6.
15. Grieve R2[1], Barnett S, Coghill N, Cramp F. The prevalence of latent myofascial trigger points and diagnostic criteria of the triceps surae and uppertrapezius: a cross sectional study,2013:99(4):278-84.
    doi:10.1016/j.physio.2013.04.002. Epub 2013 Jul 2.