THINK INDIA JOURNAL

ISSN: 0971-1260
Vol-22-Issue-16-August-2019

Kinesio Taping and Myofascial Release To Optimize Upper Trapezius Muscle Activity –A Case Series

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Background: The myofascial pain in neck region is quite common in students, smartphone users and IT professionals due to prolonged strain on neck muscles which result in pain and decreased range of motion of cervical area and occur as an over contraction of the upper trapezius and hence, the condition cause muscle tightness, spasm, stiffness and limit certain actions of the musculature along with resulting in neck pain.

Objectives: The objective of this study is to check the effect of Kinesio taping and myofascial release to optimize the trapezius muscle activity in subjects with neck pain.

Methodology: The physical therapy intervention includes the use of myofascial release technique, stretching of the upper trapezius muscle and taping application to relieve the symptoms which were conducted for 7 days. The complete treatment protocol was given on alternate days. 4 case series were done to rule out the effectiveness of treatment protocol.

Results: In case 1, 2, 3 and 4 VAS was decreased from moderate to mild. Pain threshold was increased in all four cases: (Case 1:- 2-6), (Case 2:-2-5), (Case 3:- 2.6-4.6), (Case 4:-1.4 - 4.2). The statistical analysis using t-test showed significant improvement in neck pain with p value less than 0.005.

Conclusion: This case series concluded that Kinesio taping and Myofascial Release along with conventional method reduced the pain, swelling, tenderness and the range of motion increased. It also provided the functional stability to the trapezius muscle. Pain Pressure Algometer helped to measure the pain pressure more accurately and precisely and improvement was recorded significantly. Altogether Kinesio taping and Myofascial Release was found to be very beneficial as Kinesio tape applied showed more functional stability and Myofascial Release helped in releasing the trigger points. The treatment session if continued for more weeks would result in better outcome in relieving neck pain and trigger points.

Key Words: Neck pain, Trigger Points, Myofascial Release, Kinesio Tape.

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Introduction: The myofascial pain in neck region is quite common in students, smartphone users and IT professionals due to prolonged strain on neck muscles which result in pain and decreased range of motion of cervical area and occur as an over contraction of the upper trapezius and hence, the condition cause muscle tightness, spasm, stiffness and limit certain actions of the musculature along with resulting in neck pain.[21]The trigger point forms due to the release of acetylcholine and localized sarcomere causing a decrease in the length of muscle fibers.[17]For this particular condition, most of the viewed researches and findings show the effective use of conservative treatment such as Myofascial Release and Kinesio tape in the management of the Myofascial Pain Syndrome.[5] Kinesio taping is the method of treatment that is more commonly used for the treatment of any injury and to provide stability to the joint and maintenance of postural alignment in relevance to musculoskeletal injuries. And more studies on different research show the effect of stretch tape uses and to mimic the integrity of human body tissue or skin.[20] The tape has a greater physiological effect for the reduction of edema when it is applied over stretched skin. It stimulates the Ruffini capsule (mechanoreceptors cell) of reticular layer of the dermis and can be applied for the inhibition, proprioception as well as activation of the targeted muscle, for example in an acute case its use for the inhibition of overactive muscle i.e. applied from insertion to origin and lesser stretched is applied.This have a greater quality in managing the tension given in the tape, checking different mechanical stimulus to the skin and both mechanisms can be beneficial to restore the tissue homeostasis and the application done in the strap of Y shape to facilitate the muscle and I strap for inhibition.[2]

Myofascial release is a treatment technique based on hands-on therapy in which the hand's procedure and application are with some minimal pressure with the hands onto the client body is applied. The therapies target the tissue component by and resistance by a feeling of tightness and restriction at any point or plane that provoke the pain or dysfunction. And this treatment approach provides interaction between the patient and the therapist and this promote the awareness in the body tissue. This technique of myofascial release is performed without oil or lotion to prevent slippery of the skin, this technique is benefits to regain the balance and help in the promotion of the postural alignment, it's essential for the recovery of injury as well as pain relief and remove the discomfort, it can also be applied in sportsmen to increase their mobility and performance, and can be achieved to relax the body part which the

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technique is applied especially in post-surgery patients and other people undergoing another mode of treatment.[6]

The cervical spine allows a large amount of mobility, the neck moves approximately 600 times every hour, no matter awake or asleep. The cervical region allows motion of flexion and extension, lateral flexion and rotation. These cervical motions occur in accompany to translations which increase in magnitude from C2 to C7. The most dominant translation occurs in the sagittal plane during flexion and extension. The excessive anteroposterior translation is indicative of damage to the spinal cord. The atlanto-occipital joints mobility include only nodding movement between the head and the atlas. Head and atlas work as a single unit. In flexion, there is forward rolling and backward sliding of occipital condyles and in extension; there are backward rolling and forward sliding of occipital condyles. The atlantoaxial joint allows rotation, lateral flexion, flexion and extension. About 55 percent to 58 percent of the total rotation of the cervical region takes place at atlantoaxial joints. Flexion of this segmentoccurs along with the anterior tilt of the cranial vertebral body with anterior translation. The extension takes places with a posterior tilt of cranial vertebral body along with the posterior translation. Lateral flexion takes places with ipsilateral rotation and rotation takes places with ipsilateral flexion. Lower cervical region predominantly allows flexion and extension range in spite of the great variability in the range of motion in the individual cervical segment. The range for cervical flexion and extension generally increases from C2 and C3 segment to the C5 and C6 segment and decrease again at C6 and C7 segments.[14]

Objective:

The objective of this study is to check the effect of Kinesio taping and myofascial release to optimize the trapezius muscle activity in subjects with neck pain.

Methodology:

This study was done to check to check the effect of Kinesio taping and myofascial release to optimize trapezius muscle activity in the patient with pain in the neck. The study was conducted at LPU OPD in symptomatic patients with complaints of myogenic neck pain. The physical therapy intervention includes the use of myofascial release technique, stretching of the upper trapezius muscle and taping application to relieve the symptoms which were conducted for 7days. The treatment protocol was given on alternate days.

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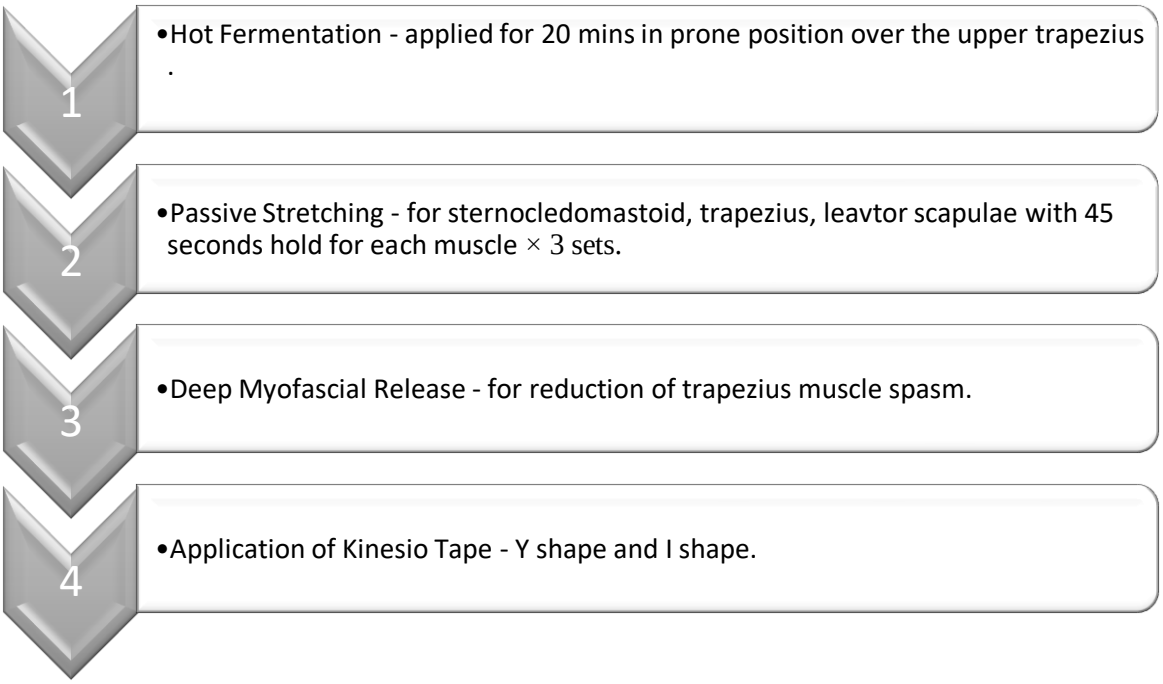
Inclusion Criteria: age of the subject be between 18-25 years old, complaint of neck pain and neck stiffness, tightness of neck muscles, decreased range of cervical motion.

Exclusion Criteria: radiating pain, allergic reaction of skin to Kinesio tape, already taking rehabilitation plan.

Outcome Measure: Pain Pressure algometry, Goniometer.

Procedure:



Case Study:

CASE STUDY 1

A 21-year-old female came to the LPU OPD with a complaint of neck and shoulder pain, stated that she had the same pain for about a few months and had taken TENS treatment but she still felt the pain. Assessment was carried out and according to Visual Analog Scale her pain was rated 6, she had a mild swelling over the shoulder level on the upper trapezius area bilaterally. Therefore the postural alignment was checked using a plumb line at the level of neck, shoulder and trunk to rule out any postural deviation, active and passive range of motion of cervical region was checked using Universal Goniometer in sitting position, flexion was 42 degree and extension 55 degree, side flexion on both the sides were 30 degree, side rotation 59 degree on right and 56 degree on left. The trapezius muscle was palpated and the tenderness was graded as 2 on touching and we also checked for the pain level by Pain Pressure Algometry and the result was 3lb on right and 2.6lb on the left side and the patient

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stated that a dull pain was felt which was intermittent in nature. After all the assessment the treatment was given by using hot fermentation in the upper trapezius muscle for 20 minutes to relax the tight muscle and after that stretching of the trapezius muscle was applied followed by Deep Transverse Friction Massage to relieve the fascia. Cryotherapy was then given for 10 minutes for the pain relief and decreases the muscle spasm and increase the elasticity of the connective tissue. After this procedure the "Y" shaped tape technique was applied to facilitate the upper trapezius and "I" strap to maintain its functional position. On the second day, we reassessed the patient's range of motion and pain using Pain Pressure Algometry and the use of a Visual Analog Scale to analyse the improvement in the previous treatment procedure. The parameters on the third-day conventional therapy were checked again along with the application of new taping for 24hours and pain parameters were checked again and 7 days treatment was given likewise and on the 7th day, all of the above mentioned interventions were reassessed and after that taping was removed. This showed significant improvement in the range of motion, tenderness was relieved and pain pressure sensitivity decreased as well.

CASE STUDY 2

A 23 year old female had a neck pain for almost a year. She got the pain over both the side's right and left during flexion and extension of the neck. Pain according to VAS scale was 5 on the first day. There were trigger points over the trapezius muscle. We also checked pain using Pain Pressure Algometer and the reading was 2lb on the first day. The ROM of neck flexion was 48 degree, the extension was 45 degree, right side rotation was 72 degree, left side rotation was 75 degree, right side flexion was 25 degree and left side flexion was 30 degree. The Spurling's test was performed to rule out the cervical radiculopathy and it was negative. To improve the blood circulation hot fomentation was given for 20 minutes. Then we proceeded to stretch the trapezius muscle followed by Myofascial Release. Cryotherapy was given to relax the muscle for 10 minutes and in the end K-tape was applied one in "Y" strap to facilitate muscle function and "I" strap to maintain its correct position. The whole mentioned treatment was given on the first day and then alternative days for total treatment protocol of seven days. On the seventh day, we reassessed the patient and all the factors were considered i.e. VAS, ROM, and PPA was recorded.

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CASE STUDY 3

A 20-year-old female came to the LPU OPD with a chief complaint of neck pain for about 7 months and had taken treatment for it. However, the pain and symptoms aggravated. An assessment was carried out in different aspects, according to Visual Analog Scale the pain was 7 then we proceeded to range of motion of neck using Universal Goniometer, the readings recorded were 48 degree of flexion and 60 degree of extension, the side flexion of both sides was 30 degree and side rotation was 62 degree in right and 59 degree on the left side. The Pain Pressure Threshold was 3.6lb on right side and 2.6lb on the left side. The treatment was given by using hot fomentation at the upper trapezius muscle for 20 minutes to relax it. Then stretching of trapezius muscle was done and Deep Transverse Friction Massage as well. After that we proceeded to Cryotherapy for 10 minutes and finally K tape was applied, one strap in "Y" shape to facilitate the upper trapezius and then "I" strap to maintain its functional position. On the second day, we reassessed the patient's range of motion, pain threshold and pain intensity. The same protocol was followed on alternative days for 7 days and on the 7th day, we reassessed the patient and collected the data.

CASE STUDY 4

A 23 year old female had a neck pain for the last 2 years and had undergone medications but the pain was not reduced. She had pain over both the sides of the neck during contra-lateral flexion i.e. while doing right side flexion she felt pain over the nape of the neck at the left side. In addition to this side rotation, flexion, and extension were done. To exclude Cervical Radiculopathy, Spurling's test (compression test, extension compression test, and distraction test) was performed. On palpation trigger points and tenderness were noted in the upper trapezius muscle. The pain intensity was assessed using Pain Pressure Algometer (with constant pressure applied i.e. 3lb throughout treatment) on Visual Analog Scale which was Moderate on both sides. While using Pain Pressure Algometer, the patient started feeling pain at 2.4lb pressure on the right side and 1.4 lb. pressure on the left side at the upper trapezius trigger points. The Cervical ROM was measured i.e. for flexion 47 °, extension 60°,right side rotation 68°,left side rotation 72 °, right side flexion 35° and left side flexion 33°. For treatment we gave 20 minutes cervical Hot Fomentation to relax and improve blood circulation over upper trapezius, then we proceeded to stretch (45-sec × 3 times) followed by Transverse Deep Friction Massage (MFR) of upper trapezius muscle for 2 minutes each side. Cryotherapy was given to reduce the signs caused due to Transverse Deep MFR for 10 minutes and in the end, we applied Kinesio tape one strap in "Y" shape to facilitate muscle

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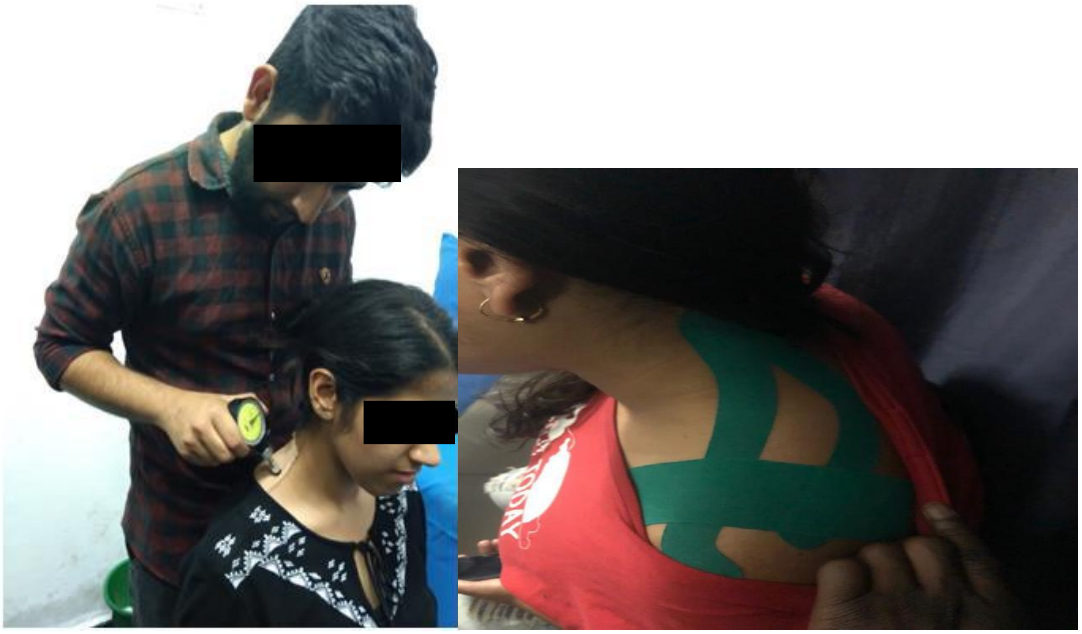
function of the upper trapezius and an "I "strap to correct the position. This treatment was given on alternative days of total treatment protocol of seven days and on the last day of the treatment we found VAS to be mild at 3lb pain pressure Algometer, range of motion increased i.e. cervical flexion 50°, extension 70°, right side rotation 78°, left side rotation 80°, right side flexion 43 °, left side rotation 42° and pain threshold increased to 4.4lb at right side and 4.2 lb. on left side over the trigger points on upper trapezius.



Pressure Algometer

Application of Kinesio tape

Statistical analysis:

After 7 days of treatment with MFR and Kinesio Taping over the 4 case study subjects, it was seen that the results for range of cervical range of motion and pain pressure Algometer showed significant decrease in values. The t-test was used to find out the significance difference between the values recorded which came out to be statistically significant with p value less than 0.005 i.e. $p<0.005$.

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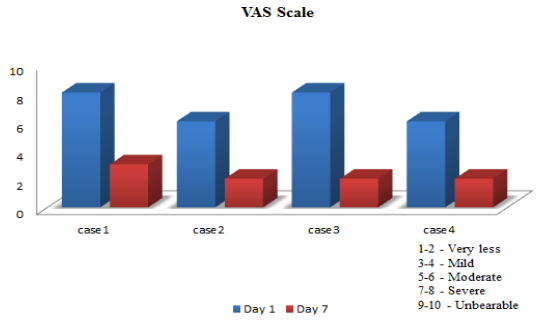
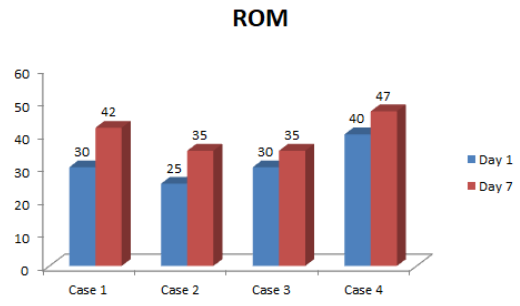
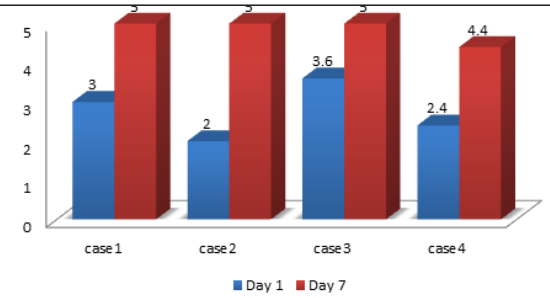
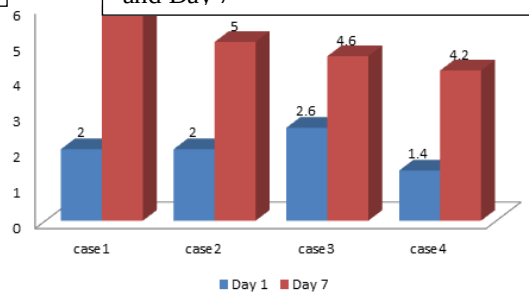




VAS Scale patient data from Day 1and follow-up on Dav 7.

ROM data of Rt. side flexion on Day 1 and Day 7





PPA Right side patient data from Day 1and follow-up on Day 7.

PPA Left side patient data on Day 1and follow-up on Day 7.

RESULTS:

After whole treatment:-

In case 1, 2, 3 and 4 VAS was decreased from moderate to mild. Pain threshold was increased in all four cases: (Case 1:- 2-6), (Case 2:-2-5), (Case 3:- 2.6-4.6), (Case 4:-1.4 - 4.2).

ROM was increased in all four cases:

1.Cervical flexion (Case 1:- 42o-51o) (Case 2:- 48o-55o) (Case3:-45o-60o) (Case4:-47o-50o) 2.Cervical extension (Case 1:-55o-66o) (Case 2:-45o-58o) (Case 3:-60o-70o (Case4:-60o-70o) 3. Cervical rotation Rt. (Case 1:-59o-68o) (Case 2:-72o-80o) Case 3:-62o-75o) (Case4:-68o-78o)

4. Cervical rotation Lt. (Case 1:-56o-67o) (Case2:75o-80o), (Case3:-59o-68o) (Case4:-72o-80o)

5. Cervical side flexion Rt (Case 1:-30o-42o), (Case2: 25o-35o), (Case 3:-30o-35o) (Case4:35o43o)

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6. Cervical side flexion Lt (Case 1:-30o-42o), (Case2:-30o-35o) (Case3:-30o-35o) (Case4:-30o-35o).

DISCUSSION

This case series was done to support the protocol having interventions including Kinesio taping and Myofascial Release for a patient with neck pain. Four case series were assessed using pain pressure Algometer, VAS, Range of Motion respectively following neck pain and upper trapezius pain sensitivity. The patient was given treatment for a week on alternative days we reassessed the patient daily and found improvement in the results. All the four participants were having an increase in pain threshold and range of motion after deep friction massage over the affected area and application of Kinesio tape. The case series supports the successful outcomes of other studies of similar neck pain. Cryotherapy helps to reduce swelling and pain. The icing causes Lewis Hunting effect due to which the pain and swelling is reduced (Electrotherapy book, Low and Reed). Furthermore, the participant in this study demonstrated an improvement in pain which was assessed using pain pressure Algometer. The tenderness was checked along the course of upper trapezius muscle using pain pressure Algometer along with this the participant has shown the reduced VAS score, following the protocol.

It also stated that the K tape application has a greater immediate effect in reducing the myofascial pain syndrome when used in a treatment to relieve the pain. And also applicable in clinical set up for the support injuries, and use for the muscular inhibition, myofascial pain relief and increasing space through the inflamed fascia.[2]

CONCLUSION

This case series concluded that Kinesio taping and Myofascial Release along with conventional method reduced the pain, swelling, tenderness and the range of motion increased. It also provided the functional stability to the trapezius muscle. Pain Pressure Algometer helped to measure the pain pressure more accurately and precisely and improvement was recorded significantly. Altogether Kinesio taping and Myofascial Release was found to be very beneficial as Kinesio tape applied showed more functional stability and Myofascial Release helped in releasing the trigger points. The treatment session if continued for more weeks would result in better outcome in relieving neck pain and trigger points.

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