“Integration of myofascial release and postural ergonomics in neck and shoulder dysfunction”- a case series

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Abstract

Background

Neck pain and shoulder dysfunction very painful condition characterized by pain, severe stiffness and movement restrictions. There are many hyperactive trigger points in the neck and upper back muscle. Myofascial release is a specific type of passive mobilization of soft tissue. Myofascial Release procedure was used as conservative management for pain and dysfunction.

Method

Five subjects have taken for this study who received Myofascial Release. Study design is experimental case series. They were diagnosed with neck and shoulder dysfunction limiting their activities of daily living. Double lacrosse ball was used for myofascial release over clavi-pectoral fascia along with postural correction exercises. Outcome measures for this study were Shoulder Pain Disability Index (SPADI) and Neck Disability Index (NDI).

Results

This study had positive outcomes with decrease in pain within 3 weeks of treatment with a frequency of 3 days/week.

Conclusion

The case report explains the outcome of myofascial release restrictions on movement of shoulder and neck. Postural ergonomics also helped to improve posture of patient with significant declined dysfunction in joints of neck and shoulder.

Key words: Myofascial Pain, Myofascial Release, Double Lacrosse Ball, Postural Ergonomics, Shoulder Pain And Disability Index, Neck Disability Index
Introduction
Shoulder dysfunction is the second most common musculoskeletal condition seen in physiotherapy, affecting between 16% to 21% of the population.[1] Fascial pain after lumbar pain is the second most common musculoskeletal pain. In this subtle painful condition of progressive restriction in the different joints of all planes of movement.[2] This disorder most often affects people between the ages of 40 and 60 and usually affects women as compared to men. Through active and passive range of motion, the patient complains of discomfort. The pain at rest and strong with movement is described as an ache and is typically worse at night.[3]

Myofascial release (MFR) is a very efficient, gentle and effective method of soft tissue mobilization that involves applying gentle and sustained pressure to the subcutaneous and myofascial connective tissue.[4] Myofascial pain is generally considered to be related to myofascial trigger points. A possible source of facial and cranial pain was associated with the trigger points in the muscles. Mechanical pain is a non-radicular pain due to local musculoskeletal structures and is characterized by a muscle spasm.[5] Posture, emotional stress, cold and muscle fatigue are causative triggers and, depending on the severity of muscle spasm and the presence of trigger point in myofascial pain syndrome, discomfort is also exhibited in different regions.[5]

Myofascial release is aimed at removing fascia restraint and restoring the tissue. This maneuver was helpful to relieve compression in the connective tissues of fascia.[6] Triplanar MFR’s technique will be the three-planar fulcrum release of indirect clavipectoral soft tissue. [7][4] There is still a lack of evidence of treatment that accelerates healing despite the numerous approaches. Researchers have therefore been looking for new methods that are specifically appropriate for improving pain, impairment and range of movement. In recent years, myofascial release has received special attention to minimize pain and stiffness. In this case series, the main objective of the researcher was to investigate the impact of MFR on pain, impairment and movement.

Methodology
Five subjects have taken for this study who received Myofascial Release. Study design is experimental case series. They were diagnosed with neck and shoulder dysfunction limiting their activities of daily living. Double lacrosse ball was used for myofascial release over clavipectoral fascia along with postural correction exercises. The outcome measures Shoulder pain and disability index (SPADI) and neck disability index (NDI) were used.

Case Series

Case I
This is a case report of 21 year old female who presented to OPD in LPU, Jalandhar with the complaints of right side Neck and Shoulder pain. She had a fall on floor in 2015 which lead her with symptoms. As a student, she was experiencing difficulties in reading due to pain and worsened in the morning. Since fall, she had reported a
decrease in overall activities within the right shoulder and also developed postural instability. Her past medical and surgery history were unremarkable. On Observation she was mesomorphic in built with forwarded head posture. On palpation multiple trigger points were found on right upper trapezius and a soft nodule on right clavipectoral region. On evaluation she couldn’t perform full ranges of shoulder and neck due to pain. Goniometric measurements of cervical flexion 75° and extension was 60°, cervical rotation on right 40° and left was 70°, lateral flexion on right 25° and left was 35°, right side shoulder flexion 90°, extension 30°, abduction 90°, internal rotation 59° and external rotation were 60°.

**Case- II**

A 55 year old female had a history of shoulder pain a year back. She was suffering from left shoulder with stiffness, restricted range of motion (RROM), household activities, along with pain. At Present she had diagnosed with Adhesive Capsulitis and tightness in pectoral major muscle which causes RROM. She had no past history of hypertension but diabetic since 5 years under medication without a family History. On Observation she was endomorphic, with normal posture and palpation findings were normal. While examination she was unable to raise her arms overhead and shoulders have no gross deformity or atrophy. Muscle strength was good but tightness at pectoralis major muscle with tenderness. The Hawkins test was positive for pain in left shoulder. Active motion is unequal for the right and left. Goniometric measurements for right shoulder were flexion 160°, 60° extension, abduction 145°, 65° lateral rotation, 70° medial rotation and left shoulder flexion 110°, extension 50°, abduction 70°, external rotation 10°, internal rotation 10°.

**Case-III**

For two years, a 41-year-old woman had a history of neck pain. She couldn’t perform household activities due to the right side neck stiffness, pain with RROM of cervical extension. She had no past medical, family history of hypertension and diabetes. While observation she was mesomorphic with structural deformity at cervical level C4 - C7. The palpation findings were normal. On examination she had slight discomfort when using phone for long time and other activities in flexed neck posture i.e sewing and stitching cloths. Muscle strength was good with all motions bilaterally. The spurling test was positive and pain radiates from right neck region (upper trapezius) to ipsilateral shoulder. Goniometric measurements of right shoulder flexion 180°, extension 50°, abduction 170°, for left shoulder flexion 180°, extension 50°, abduction 170° and for neck rotation to right side 80° and to left side 65°, cervical flexion 55° and extension 40°.

**Case-IV**

A 30 year old male working as assistant professor had a history of pain on right side of neck since 6 months. He was working on laptop for more than 6 hours continuously in a day and suffered headache. He got aggravated
symptoms while driving a car and had difficulty in sleeping due to discomfort in neck with complains of sinusitis and migraine. On examination NPRS for pain revealed was 6 (moderate pain) on right side of neck and with relapse and remission of symptoms by position. While observation he was mesomorphic with forward headed posture and tenderness, tightness on the neck region (grade – 2) on palpation. Goniometric measurements of cervical flexion 60°, extension 40°, lateral flexion 50°. Myotome, Dermatome and Reflexes showed Normal.

Case-V

A 21 year old female had chronic neck pain presented to these authors with the complaints of pain in neck, shoulder and occipital protuberence since 3 months. She was known case of anaemia and on folic acid supplements since last year. Patient was apparently well before January, 2018 while getting up from supine lying to sitting; patient had a sudden tightness in neck and shoulders followed by a sharp pain. These symptoms were last till March, 2018. She complained of severe neck, shoulder and occipital headache which were aggravated on using the mobile phone, laptop and sleeping on a pillow. On observation, patient was mesomorphic with a stooped posture and slightly protruded head with no evident bony deformity and muscle wasting. On palpation, she had a grade 3 tenderness bilateral to C5-C6 spinous process with spasm on posterior shoulders with no evident swelling or scar formation. On examination, Cervical Extensors, side flexors and rotators were weak with goniometric measurements were cervical flexion and extension of 30°, rotation 55° degree respectively, although Cervical Flexors had a normal strength and range of motion.

Therapeutic Interventions

Treatment include the Myofascial release (MFR) with double lacrosse ball (DLB) on clavipectoral fascia and upper trapezius muscle and patient was positioned in supine lying with shoulder 90° abduction with elbow flexion. The therapists stand at a 45° angle to patient and then gently start the MFR technique with double lacrosse ball in the direction from medial to lateral with origin to insertion of trapezius muscle. All patients had undergone through 15-20 min for 3days in a week with duration of 3 weeks. After one week patient reported that the pain was almost reduced and shoulder and neck range of movement had increased as compared to previous report. The patient was also instructed to follow a set of postural ergonomics to aid in relieving his/her condition and was explained about seating arrangement, work at surface, handling keyboard, mouse, position of monitor, chair height should be appropriate for proper back support, elbows to be in 90 degree of flexion by the arm rest.
Method of Application

Origin to insertion       Insertion to origin

Results

Table 1: shows pre–post mean values of NDI[8] and SPADI

<table>
<thead>
<tr>
<th>Case</th>
<th>Pre NDI (%)</th>
<th>Post NDI (%)</th>
<th>Pre SPADI (%)</th>
<th>Post SPADI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case I</td>
<td>36</td>
<td>20</td>
<td>51.5</td>
<td>24</td>
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<tr>
<td>Case II</td>
<td>34</td>
<td>18</td>
<td>50</td>
<td>42</td>
</tr>
<tr>
<td>Case III</td>
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<td>11.1</td>
<td>49</td>
<td>40</td>
</tr>
<tr>
<td>Case IV</td>
<td>14</td>
<td>04</td>
<td>47</td>
<td>39</td>
</tr>
<tr>
<td>Case V</td>
<td>42</td>
<td>12</td>
<td>50</td>
<td>41</td>
</tr>
<tr>
<td>Mean</td>
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<td>13.02</td>
<td>49.5</td>
<td>37.2</td>
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<tr>
<td>Mean difference</td>
<td>16.62</td>
<td>12.3</td>
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</tr>
</tbody>
</table>
Case -I
Patient reported with the pain in neck and shoulder joint with limited range of motion. After 3 weeks of treatment of 30 minutes session per day, patient showed a significant improvement in NDI, SPADI scale. Patient returned with the improvement of ROM in neck and shoulder joint.

Case-II
The patient had gone through 15-20 min, 3 days/ week treatment for 3 weeks, treatment include MFR with DLB on the clavipectoral fascia and deltoid muscle which shows very good result in the mid of second week only. It increases the shoulder movement and decreases the muscle tone of pectoral major muscle and flexibility, it decreases the NPRS from 7 to 5 in 3 weeks and SPADI from 50% to 42%.

Case-III
Patient was treated with MFR for neck pain on right side and restricted ROM using a DLB for 15 minutes from origin to insertion of trapezius for 3 days a week for 3 weeks and patient showed the improved ADL, ROM and score for NDI changes from 22.2% to 11.1%.

Case-IV
Patient was suffering with the pain in neck limited range of motion with sleep disturbance. After 3 weeks of treatment of 30 minutes session per day, patient showed a significant improvement in NDI, scale. Patient returned with the improvement of ROM in neck and better result in sleeping.

Fig.1: Shows graphical representation of pre - post values of NDI and SPADI[9]

![Graphical representation of pre - post values of NDI and SPADI](image-url)
Case-V

Patient had a severe neck pain along with extreme headache. The Myofascial release technique on neck, sub-occipital region and clavipectoral fascia on those with severe posture related back pain improved NDI from 42% to only 12%. The NPRS was also decreased from 6 to 2 after the treatment showed clinically significant.

Discussion

According to recent clinical studies common problems faced by people were pain and Limitation of shoulder and cervical movements. The main causes of these problems were trigger points over clavipectoral region and trapezius muscle. These authors of the study aimed to investigate the effects of myofascial release using Double Lacrosse ball to the clavipectoral fascia to reduce pain for the improvement of the shoulder joint motion. These trigger points release of upper trapezius helped to alleviate pain and improve movements of cervical spine. This study identified a significant, clinically relevant increase in ROM and also relief in pain.

All patients were suffered a lot of pain over neck and shoulder region with limited ROM before the treatment. After intervention of three weeks these patients were improved in neck and shoulder joint pain. Shoulder increased ROM and pain relief is typically linked to the treatment of clavipectoral release. The clavipectoral and trapezius release with “Double Lacrosse” ball showed more improvement in SPADI, NDI and ROM. This study of nine sessions of MFR with shoulder girdle exercises improved significantly in pain (VAS) but according to Ekta.S et al only MFR has been successful in raising the tolerance of stress pain and upper trapezitis ROM and tight clavipectoral fascia. In tight clavipectoral fascia there will be restriction in shoulder flexion above 90 degree after baseline and post-treatment analysis score, revealed substantial progress of shoulder range of motion and pain. This maneuver has shown progress in visual analog scale & SPADI. Local chemical changes as myofascial release is used on the shoulder and trapezoid due to blanching of the nodules. This flushes out the muscle inflammatory exudates and pain metabolites, breakdown the scar tissue, desensitize the nerve ending and reduce muscle tone. Thus myofascial release has, on the trigger point, basically the same mechanism of action as injection therapy. MFR is a non-invasive technique which never resulting in tenderness after intervention and for short observation period. [10]

Mechanical neck pain with referred pain to upper limb is common problem and often leads to various problems while doing various daily activities. These symptoms were aggravate when the head and neck were in flexed posture during laptop and mobile phone usage. Neck pain was second most common musculoskeletal pain. Prevalence was 27.2% in female and 17.4% in male population. During daily activities, excessive use of desktop is often cited as a source of neck pain. This literature review discusses elements of neck pain relevant to software use in public health. A comparative study was done by kayleigh E.de Meulemesster et al who intervened with dry needling and MFR with Double lacrosse ball to release trigger point was more effective. [11]
These clinical trials on 42 female patient treatment and then evaluated there treatment with NDI, generic numeric scale, and pain threshold pressure.

This study focused on finding the therapeutic effects of myofascial release technique on neck pain and decreased shoulder movements. This treatment involved use of lacrosse ball by the therapist to release the tight trapezius muscle’s fascia and clavipectoral fascia from origin to insertion of the respective fascia.[12] Along with that postural ergonomics were also given to the patient that involved modification of the sitting position and appropriate distance between the head and the monitor. After the treatment neck pain was significantly reduced and the shoulder range of motion restriction was no more present. Patient showed significant improvement in NDI and Visual Analogue Scale.

Conflict of interest: nil

Source of funding: self

Ethical clearance: ethical approval given by department of physiotherapy, Lovely Professional University, Phagwara.

Conclusion

The case report describes the result of myofascial release on neck pain and shoulder range of motion restrictions. The overall study had positive outcomes with decrease in pain within 3 weeks of treatment with a frequency of 3 days/week. Postural ergonomics also lead to improved posture of the patient in significantly decreased the associated pain. MFR is a cheap and highly accessible tool that allows individuals to be versatile and potentially relieve myofascial pain[13].

Limitation- Sample size was small. Material used for MFR would be different.

Future Scope of the Study- Variable textures of the ball can be used to release the fascia. The postural ergonomics could be taught using audio visual aid and the special sensors could be used whenever the patient’s posture goes wrong.

Reference


