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Myofascial Release Therapy's Ability To Reduce Pain And Enhance Functional Results For Patients With Myofascial Neck Pain

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ABSTRACT

Background and Aim:

Myofascial neck pain is common in IT world, students, continuous mobile users, bad postures and improper sleeping position etc. Myofascial neck pain can hinder quality of life due to associated comorbidities such as sleep disturbances and depression. In addition, the myofascial nature of myofascial pain syndrome predisposes afflicted patients to maladaptive emotional responses such as catastrophizing and rumination of existing pain and fear of physical movement. A variety of physiotherapy interventions have been used to treat mechanical neck pain, but few of them have proven effective. The number of studies on the clinical effectiveness of MT techniques, such as myofascial release therapy (MRT), has seen a marked increase. Myofascial release (MFR), a form of manual therapy, uses a low-load, sustained stretch on the myofascial complex to restore appropriate length, lessen pain, and enhance function. The aim of the study is to find out the effectiveness of myofascial release therapy in reducing pain and improving functional outcome for subjects with myofascial neck pain.

MATERIALS AND METHODS

A total of 30 subjects with myofascial neck pain were selected based on the inclusion and exclusion criteria. The informed consent obtained and information sheet were provided to all the subjects, before commencing the study. The quasi-experimental study was conducted for 30 subjects, where the base line outcome measures were taken through Neck disability index (NDI) and Pressure algometer. All recruited subjects were treated with myofascial release therapy for the myofascial neck pain (upper trapezius muscle) for a period of 4 weeks, thrice a day, treatment frequency for each session was 30 minutes. The post-test measurement were carried out with same outcome measures at the end of 4 weeks.

Results:

The mean value of NDI and pressure algometer are statistically significant. From the statistical analysis with the quantitative data statistically significant for the NDI scale the mean and standard deviation of the pre-test and post-test values were seen and showed that Myofascial release therapy are effective in treating myofascial neck pain patients

Conclusion:

From this result, it has been concluded that subjects undergone myofascial release therapy shows significant effect on myofascial neck pain.

Keywords: Pressure Algometer, NDI Scale, Myofascial Neck Pain, Myofascial Release Therapy

INTRODUCTION

In recent years, several studies have emerged about myofascial pain syndrome (MPS) among patients suffering from neck pain. MPS is the presentation of sensory, motor, and autonomic symptoms caused by MTrPs (myofascial trigger points)⁽¹⁾. Myofascial pain syndrome is defined as a pain disorder involving pain referred from trigger points within myofascial structures, either local or distant from the pain. A trigger point is defined as a localized tender area in a firm band of skeletal muscle, tendon, or ligament. These points can occur in any skeletal muscle of the body, although they occur most frequently in the head, neck, shoulders, and lower back⁽²⁾.

In the general population, neck pain is relatively prevalent, and the prevalence of neck pain varies worldwide from 14.6% to 55.2%⁽³⁾. The global point prevalence of neck pain in 2017 was higher in females compared with males, although this was not significant at the 0.05 level. The number of incident cases were highest at age 45-49 years, after which a declining trend was observed at older ages⁽⁴⁾. The most prevalent active MTrPs in the trapezius muscles were identified in 93.75% of the subjects, in the levator scapulae in 82.14%, and in the multifidi in 77.68% of the subjects.

MTrPs in the splenius cervicis reached a prevalence of 62.5%. The most prevalent active MTrP diagnosed were located right and left (82.1% and 79%, respectively)⁽¹⁾.

The International Association for the Study of Pain are classified into two types of neck pain: mechanical or non-specific, and specific. Mechanical neck pain or non-specific neck pain is defined as generalized neck pain provoked by sustained neck postures, neck movement, and pain on palpation of cervical musculature without pathological.

Myofascial neck pain come under non-specific neck pain⁽⁵⁾. In the neck region myofascial pain syndrome (MPS) can manifest as tension headache, tinnitus, temporomandibular joint pain, eye symptoms, and torticollis. The muscles commonly involved are the sternocleidomastoid, masseter, temporalis, pterygoid, and cervicis⁽⁶⁾. Other muscles that refer pain to the posterior neck area are the trapezius, multifidi, splenius cervicis, levator scapulae, and infraspinatus muscles⁽¹⁾.

The development of trigger points can be divided into two basic concepts:

1. Factors that directly traumatize a muscle by direct injury or by repetitive microtrauma from habits that produce muscle tension. The most frequently mentioned of these include poor postural habits and parafunctional oral habits.
2. Factors that weaken a muscle and predispose it to the development of trigger points through such factors as nutritional disturbances, structural disharmony, lack of exercise, sleep disturbances, or the presence of other disorders, such as joint problems⁽²⁾.

Some of other causes are trauma (such as whiplash and traumatic brain trauma) and certain sports injuries are particular risk factors for neck discomfort (e.g., wrestling, ice hockey, football). Although some studies have revealed that particular jobs, such as those involving computers and the office, physical labour, and the health care industry⁽⁷⁾.

The clinical symptoms of patients with myofascial neck pain mainly include neck pain, difficulty performing neck exercises, shoulder or upper limb pain, migraine, muscle function imbalance, and abnormal breathing patterns. At present, there is evidence that exercise therapy, muscle energy techniques, manual therapy and breathing training can effectively improve the discomfort of patients with myofascial neck pain⁽⁸⁾.

A variety of physiotherapy interventions have been used to treat mechanical neck pain, but few of them have proven effective. It has been suggested that manual therapy (MT) combined with exercise is the most effective physiotherapy intervention in the treatment of neck pain. Manual therapy for neck pain includes manipulation, acupuncture, and soft tissue therapy. Among these approaches, there is evidence that acupuncture and manipulation can effectively improve the intensity of pain and the dysfunction of patients with myofascial neck pain. TENS treatment has shown mixed results in the treatment of myofascial pain. Ultrasound in combination with massage and exercise has been tested in patients having myofascial pain syndrome, has shown no significance effect. Soft tissue therapy includes massage, acupressure, and myofascial release therapy. Compared with no treatment, the use of massage to treat musculoskeletal pain has a short-term effect, when it compared with other therapies such as acupuncture and myofascial release therapy.

The number of studies on the clinical effectiveness of MT techniques, such as myofascial release therapy (MRT), has seen a marked increase ^(8,9,10).

Myofascial release therapy, a more modern therapy, is being incorporated into the normal therapeutic activity of physiotherapists ⁽⁹⁾. Myofascial release (MFR), a form of manual therapy, uses a low-load, sustained stretch on the myofascial complex to restore appropriate length, lessen pain, and enhance function. MFR frequently entails either directly (direct technique MFR) or indirectly (indirect technique MFR) exerting gradual, continuous pressure on constricted fascial layers or a trigger point for 120 ± 300 seconds ⁽¹¹⁾. A trigger point is a tender point within a tight muscular band which is stimulated by excessive pressure, tension, contraction, or loading ⁽¹²⁾. MFR practitioners use their hands, elbows, or other items to gradually sink into the fascia; pressure is delivered using a few kilograms of force to touch, apply tension to, or stretch the fascia ⁽¹¹⁾.

Northwick Park Neck Pain Questionnaire (NPQ) and Copenhagen Neck Functional Disability Scale are recently used outcome measures for neck pain having low quality evidence of good to excellent internal consistency and low-quality evidence of excellent internal consistency respectively. Out of this high-quality evidence was found for NDI (Neck Disability Index) scale of good to excellent internal consistency ⁽¹³⁾. Another outcome measure used were the pressure algometer, it is useful tool for physicians and researchers because it can measure changes in trigger point sensitivity and more accurate quantity measurements ⁽¹⁴⁾.

Pressure algometer is an accurate spring-mounted plunger, which was initially described in Victorian times ⁽¹⁵⁾. These devices are frequently portable, and one of their features is a "maximum hold" function that shows the highest pressure ever attained in a single application. These instruments typically feature a 1cm^2 pressure application surface and show readings of force in newtons or kilograms. In order to maximize dependability, it has been noticed that the force application should be perpendicular to the body surface and the rate should be constant at around $1\text{ kg cm}^{-2}\text{s}^{-1}$ or 10 N s^{-1} .

¹. Faster force application may result in a low false threshold measurement ⁽¹⁶⁾. The Verbal Report of Pain 4 measures the first-time individuals reported feeling pain (VRP). The Pain Reaction Point (PRP) was where they claimed the pressure "hurt a lot" ⁽¹⁷⁾. An evaluation tool was used to measure the neck disability index (NDI). Ten topics, including pain intensity, everyday life, lifting, reading, headaches, level of concentration, work, driving, sleep, and leisure life, were covered by six questions, each of which had a 0 ± 5 point scale. Subjects were asked to choose one of these questions in relation to each item. Higher scores reflect a greater functional impairment caused by a neck deformity ⁽¹⁸⁾.

Objectives of the Study:

1. To evaluate the effect of myofascial neck pain due to the bad posture.
2. To determine the effectiveness of myofascial release therapy for myofascial neck pain.

METHODOLOGY

Selection Criteria Inclusion Criteria

- Gender: both male and female
 - Age: 20-50 years
 - Trapezitis
 - Mechanical neck pain
 - Neck pain with or without symptoms radiating to the head or upper limb
- ### Exclusion Criteria
- Fractures
 - Open wound
 - Neoplasia
 - Metastasis
 - Severe osteoporosis
 - Infectious bursitis
 - Cervical stenosis

This experimental study was in Shadan College of Physiotherapy based on the selection criteria by convenient sampling. The myofascial neck pain is assess by using neck disability index questionnaire and pressure algometer. The pressure algometer device comprises of a plunger-mounted pressure (force) gauge and a hard rubber tip with a diameter of 1 cm. The gauge's dial has a kg/cm² calibration. This aids in quantifying the discomfort felt near the upper trapezius muscle. Each subject was particularly told to indicate when the pressure started to hurt. The subjects were made aware that the study's goal was to establish the pain threshold rather than pain tolerance. The measurements were noted down.

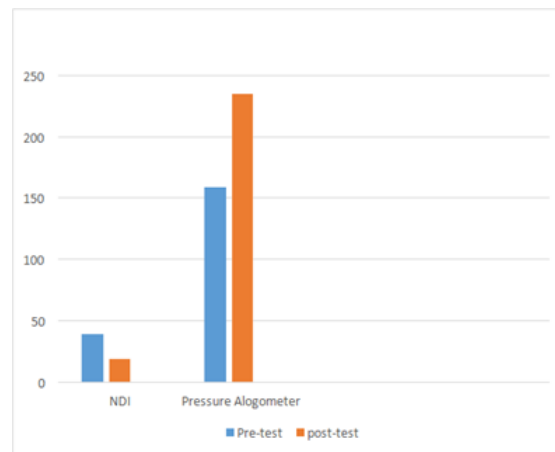
All recruited subjects were treated with myofascial release therapy for the myofascial neck pain (upper trapezius muscle) for a period of 4 weeks, thrice a day, treatment frequency for each session was 30 minutes. The post-test measurement were carried out with same outcome measures at the end of 4 weeks.

RESULTS

From the statistical analysis with the quantitative data statistically significant for the NDI scale the mean pre test value is 39.33 and in mean post value 18.50. The standard deviation value for pre test is 7.85 and post test value 6.04. T value is 35.234 and p value is <0.001. From the statistical analysis with the quantitative data statistically significant for the pressure algometer the mean pre test value is 159.00 and mean post test value is 235.00. The standard deviation value for pre test is 8.03 and in post test value is 4.35. The T value is 90.0280 and P value is <0.001. From the statistical values of both the outcome measures of Neck Disability Index and Pressure Algometer were used. In Neck Disability Index the mean post test result is less compared to the mean pre-test value of the same outcome measure. so, it shows improvement in quality of life. And from the pressure algometer the mean post test results is more compared to the mean pre test value. So, the threshold of pain gets reduces.

Table 1 Pre and Post-test values using NDI scale and Pressure algometer

Outcome measure	Mean pre-test value	Mean post-test value	SD pre-test value	SD post-test value	T value	P value
NDI	39.33	18.50	7.85	6.04	35.2341	<0.001
Pressure Algometer	159.00	235.00	8.03	4.35	90.0280	<0.001



DISCUSSION

In this study, the students and faculties of Saveetha college of Physiotherapy with myofascial neck pain were examined and we looked at how myofascial release therapy is effective in treating myofascial neck pain using pressure algometer and NDI scale. During this study all the students and faculties involved actively and no drop outs were seen, all were cooperative to the treatment protocol.

In this study 30 subjects having myofascial neck pain has been selected and marked pre-test values using outcome measures like NDI scale and Pressure algometer and tabulated. The pressure algometer helps to spot trigger point easily. According to Cerezo-Téllez E et.al in 2016 concluded that although the prevalence and incidence of MPS have been studied in various patient populations, including patients in an internal medicine practice, patients diagnosed with fibromyalgia, and patients with shoulder girdle pain, among others, to the best of our knowledge, this is the first published study addressing the prevalence of MPS among subjects with chronic non-specific neck pain. In addition, this study determines the prevalence of both active and latent MTrPs in this population, for individual muscles (left trapezius, right trapezius, etc.) and more in general (general prevalence of trapezius muscle, etc.).⁽¹⁾ according to Rodríguez-Fuentes I et.al in 2016 According to Reeves.JL et.al in 1986, concluded that the important therapeutic and scientific implications stem from the capability to accurately evaluate myofascial trigger point sensitivity.

The pressure algometer may be a helpful instrument to measure the clinical effect of various treatment methods since trigger point sensitivity is a clinical indication that alters with therapy.

Future studies using the pressure algometer may also provide interesting insights into the differences in sensitivity between active and latent trigger points, the relationship between an active trigger point's sensitivity and the intensity of the referred pain and associated phenomena, and the association between trigger point sensitivity and other physiological factors like EMG activity and autonomic functions.

And NDI scale is used to calculate or evaluates neck pain perception and determines if a person is disabled based on everyday activities.⁽⁹⁾

According to Macdermid JC et.al in the year 2009 concluded that no other instrument has undergone sufficient development or validation to displace the NDI as the tool of choice in routine evaluation of neck impairment, and this is undoubtedly true. Although evidence and measurement principles imply that patients who score at the extremes may benefit from extra measures, such as the Patient-Specific Functional Scale, they are still able to benefit from using the instrument for clinical research and treatment. Myofascial Release Therapy has been given for the subjects for 30-45 mins in a session in thrice in a week for 1 month. After the intervention, again the post-test values are assessed with the help of NDI scale and pressure algometer the results show an improvement seen in subjects⁽¹⁹⁾.

According to Gauns SV et.al in the year 2018 concluded that, when compared to the control group, subjects with mechanical NP referred to a single upper limb who received treatment with gross MFR of the posterior cervical musculature and the upper quarter arm pull technique improved more in terms of

pain relief, neck flexor endurance, range of motion, and functional abilities. Both the Neck Disability Index and Pressure Algometer outcome measures were calculated using statistical data. The mean post-test result for the Neck Disability Index is lower than the mean pre-test score for the same outcome measure. So, it indicates a rise in quality of life. Additionally, the mean post-test values from the pressure algometer are higher than the mean pre-test value. As a result, the pain threshold decreased.⁽⁵⁾

CONCLUSION

From this result, we can concluded that subjects with myofascial neck pain who underwent myofascial release therapy has shown a significant effect.

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