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Effectiveness of myofascial release (MFR) and long wave diathermy (LWD) on upper trapezius spasm

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Abstract
Background: Myofascial Release is a where fascia is strong connective tissue which spreads throughout the body in a three-dimensional web from head to toe. Myofascial release is a technique where hands-on soft tissue that facilitates a stretch into the restricted fascial. Long wave Diathermy is used for pain relief and to increase the range of motion (ROM). Long wave diathermy (LWD) speeds up the recovery in chronic pain conditions.
Objective- This study aims to find the effectiveness of Myofascial Release (MFR) and Long Wave Diathermy (LWD) on trapezius spasm.
Methodology: Study involved 30 participants with trapezius spasm Myofascial release along with Long wave diathermy was given to all the participants. Pre and post readings of Numeric Pain Rating Scale and Wong Baker Faces Pain Rating Scale were recorded then data analysis was done using paired "t" test.
Outcome measures: The outcome measure was Numeric Pain Rating Scale and Wong Baker Faces Pain Rating Scale.
Results: The data was analyzed using paired t test. Pre-intervention score for NPRS was 6.53±1.00 and for Wong Baker Faces Pain Rating Scale was 6±1.54. Post intervention data collected showed (±SD) of 1.96±1.06 for Numerical Pain rating Scale and for Wong Baker Faces Pain Rating Scale was (±SD) 2.33±1.16. Result Showed that T value for Numerical Pain Rating Scale was 39.952 and for Wong Baker Faces Pain Rating Scale was 17.535 which is considered as highly significant.
Conclusion: In this study, it was concluded that Myofascial Release and long wave diathermy was effective on upper trapezius muscle spasm in young adults.

Keywords: myofascial release, long wave diathermy, numerical pain rating scale, Wong baker faces pain rating scale, trapezius spasm

1. Introduction

In human anatomy, the trapezius is a superficial muscle that originates longitudinally from the occipital bone and inserts to the lower thoracic vertebrae and laterally to the spine of the scapula. Its functions are to support the arm and move the scapula [1]. Upper trapezius performs elevation and upward rotation of the scapula, as well as extension, lateral flexion and contra lateral rotation of the neck. The lower trapezius actions are upward rotation, adduction and depression of the scapula. The upper trapezius is also a secondary muscle of respiration [1]. When there is excessive use of the Trapezius Muscle it leads to muscle fatigue resulting in pain which is known as trapezius spasm [2]. Muscle spasm is caused due to accumulation of products of inflammation, overstretch and hypersensitivity of muscle spindles and decreased circulation to muscle fibres with ischemia and build-up of waste products [3].

Fascia is strong connective tissue which spreads throughout the body in a three-dimensional web from head to toe. The fascia is surrounding every bone, muscle, blood vessel, nerve and organ all the way down to the cellular level. The fascial system function as a support, stability and cushioning. It is also a system of motion and dynamic flexibility forming muscle. Tightening of the fascial system is a physiologic, histologic and biomechanical protective mechanism that is a response to trauma [4]. The fascia loses its elasticity, becomes restricted, and is a source of tension to the rest of the body and the collagen becomes dense and fibrous, and also loses its elasticity. The functional capacity is lost and a patient is in pain. Myofascial release is a technique where hands-on soft tissue that facilitates a stretch into the restricted fascia [4]. Myofascial Release is defined as the facilitation of mechanical, neural and psychological and physiological adaptive potential via the myofascial system. Myofascial Release (MFR) is a soft tissue mobilization technique used to relieve muscle spasm [2]. Fascia is a type of connective tissue that is divided into 3 layers: the superficial layer, a layer of potential space, and a deep layer [5]. Myofascial therapies cover a numerous and varied spectrum of techniques, including structural integration (Rolling), osteopathic soft-tissue techniques, massage including connective tissue massage (CTM), instrument assisted fascial release, myofascial trigger point therapy and muscle energy technique (MET). Myofascial release (MFR) techniques have developed as a result of current research and investigation via dissection and real time ultrasound and elastography [6]. The types of MFR are direct myofascial release, indirect myofascial release and Self myofascial release. These are the techniques used for the purpose of relieving soft tissue from an abnormal hold of a tight fascia. Direct Myofascial release is the direct method which works directly on the tight fascia. The practitioners use elbows, knuckles, ulnar border of the hands, fist or other tools to slowly go down in to the restricted fascia applying little

pressure and stretch the fascia. This method is slight painful. Indirect Myofascial release is the indirect method where the gentle stretch and mild pressure is applied, the hands tend to go with the restricted tight fascia, hold the stretch, and allow the fascia to "relax" itself. On restricted fascia the gentle traction is applied which will result in heat, which increase blood flow in the area. The intension is to allow the body's essential ability for self-correction returns, thus reduce pain and restoring the optimum performance of the body. Self Myofascial release is a method where the individual uses a soft object to provide MFR under their own power or strength. Usually an individual uses a tennis ball, soccer ball or soft roll on which to rest one's body weight [5].

Diathermy is based on the use of high frequency currents for the generation of heat in the tissues of the body for therapeutic purposes. By 1900, the high-frequency currents of 1,000,000 to 3,000,000 cycles per second (long-wave diathermy) were in use [7]. The high-frequency currents used for diathermy can be applied locally for the purpose of heating the superficial and deep tissues. Diathermy can be classified in the following three divisions, depend on differences in wavelengths and on the sources of the high-frequency current: Short-wave diathermy, Long-wave diathermy and Micro-wave diathermy. This indicates the range and frequencies of wavelengths employed in the various divisions of the electromagnetic spectrum as it applies diathermy [8].

Long wave Diathermy is used for pain relief and to increase the range of motion (ROM). Long wave diathermy operates at a frequency range of 0.3-1MHz which produces deep heat into the tissues, which last for 10 minutes and stimulates the thermo receptors and block the pain. Physiological effects include increased circulation and blood flow, increased metabolism, increased muscle temperature, decreased pain, decrease tissue stiffness and muscle spasm relaxation [9].

The Numerical rating scale (NRS), Wong Baker facial pain scale (WBFPS) and descriptive pain scale (DPS) are the widely used pain scale [10]. Numeric Pain Rating Scale (NPRS) is a segmented numeric version of the visual analog scale (VAS) during which a respondent selects a full variety (0–10 integers) that best reflects the intensity of his/her pain [11]. In Wong Baker scale the patient's expression are observe and given marks for her pain scoring [10].

This study focuses to determine the combined effect of myofascial release and long wave diathermy in individuals present with upper trapezius muscle spasm which is caused during activities.

2. Methodology

Source of Data

The source of data will be collected form the students having hamstring tightness from Dr. APJAK college of physiotherapy, loni, Maharashtra.

Method of collection of data

Type of Data: Data will be primary collected by the principal investigator

Study Design: Prospective Experimental Study

Sample size: 30

Participants: Patients between 18 to 25 years of age having upper trapezius spasm.

Sampling Method: Convenient sampling.

Study Duration: 6 days

3. Procedure

The ethical clearance form registration no. BPT/INT/2018/30 for the following intervention ethical clearance was obtained from the ethical committee. Participants were from Dr. APJ Abdul Kalam College of Physiotherapy, Loni. Participants were screened according to the inclusion and exclusion criteria. Written informed consent was taken from the participants. The study included 30 participants on the basis of inclusion and exclusion criteria. Pre and post outcome measures were taken. Before starting the intervention sessions outcome measures were assessed. In this study the participants were given Myofascial release along with Long wave diathermy for 6 sessions. Similarly after the 6 interventions the outcome measures were assessed again as a post intervention.

Intervention

Myofascial Release

The participant was in a comfortable sitting position on chair and both feet were firmly placed on the floor. Lotion/gel was used for lubrication. Therapist stands behind the chair and places both hands on posterior aspect of the neck on upper trapezius muscle of one side. Patient is instructed to actively stretch the muscle by his/her hand and therapist gently applies myofascial release with both hands using his ulnar border. It was given for 10 minutes followed by stretching of upper trapezius muscle 3 times for 90 seconds. Cold pack was given over upper trapezius in sitting position for 20 min. Procedure is applied once daily for 6 days.

Long Wave Diathermy

After the myofascial release, long wave diathermy is a deep heating modality. Long wave diathermy uses an electric current to produce heat deep inside the targeted tissue. It can reach areas as deep as 2 inches from the skin's surface. There are 2 electrodes: a small insulated electrode (active electrode), other non-insulated electrode which is placed in the patient's hand. The patient should be in sitting position with the electrode in the hand. The therapist will stand behind the patient. Before the treatment starts, the patient is asked to remove the metal accessories or jewelry. Then the active electrode is placed on the trapezius muscle and when the machine is on, it is moved in a circular manner for 5mins on the trapezius muscle. Each trapezius muscle should be treated for 5 minutes. The treatment lasts for 10mins. This is given for 6 days continuously.

Fig 1: MFR on left upper trapezius

Fig 2: LWD on left upper trapezius

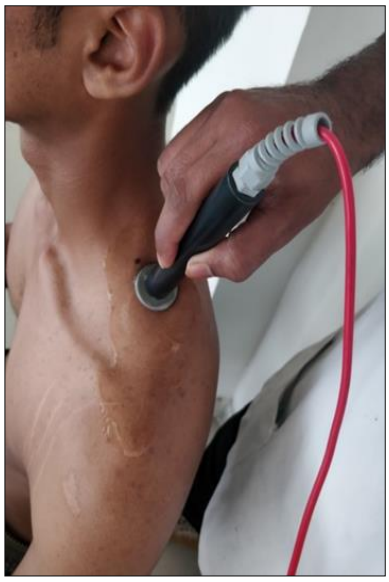

Fig 3: LWD on left upper trapezius

4. Results

The objective of study was to find the effect of Myofascial release and long wave diathermy on trapezius muscle spasm which was analyzed on the basis of Numeric Pain Rating Scale and Wong Baker Scale.

The statistical analysis was done using Microsoft Excel. Various statistical measures such as mean, standard deviation (S.D) and test of significance such as student's paired 't' test were analyzing the data. The result was concluded to be highly significant with the p value is <0.0001.

Table 1: Numeric Pain Rating Scale

	Mean	SD	p Value	t Value	Significance
PRE	6.53	1.00	<0.0001	39.952	Extremely Significant
POST	1.96	1.06			

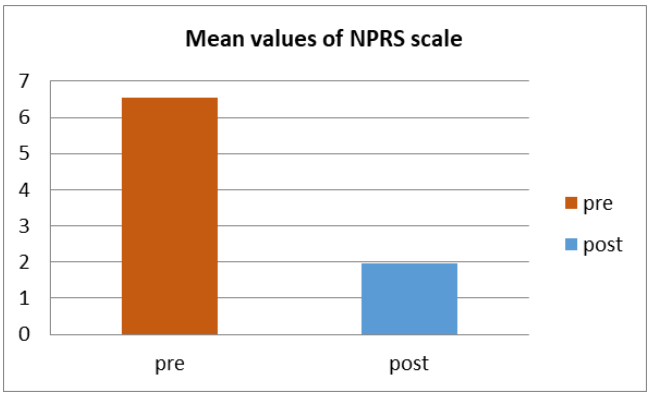

Fig 1

Table 2: Wong Baker Scale

	Mean	SD	p Value	t Value	Significance
Pre	6	1.54	<0.0001	17.535	Extremely Significant
Post	2.33	1.16			

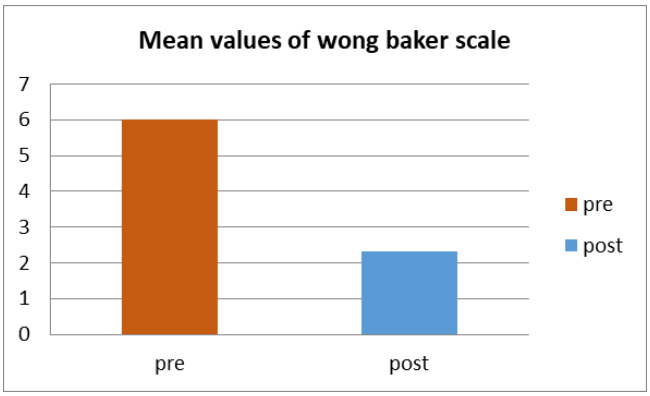

Fig 2

Table no.1: the pain was measured using NPRS before and after the intervention was given and the p value is <0.0001 and t value is 39.95 i.e. extremely significant which was calculated by using paired t test.

Table no.2: the pain was measured using Wong baker scale before and after the intervention and the p value is <0.0001, the t value is 17.53 and the result is extremely significant which was calculated by using paired t test.

5. Discussion

The present study was undertaken to see the effectiveness of Myofascial Release (MFR) and Long Wave Diathermy on

upper trapezius spasm. The effect of myofascial release and long wave diathermy show significant improvement in pain and function in participants with upper trapezius muscle spasm. All the 30 participants showed significant relief of pain of trapezius spasm because of myofascial release and long wave diathermy.

In table no.1 the pain was measured using NPRS before and after the intervention was given and the p value is <0.0001 and t value is 39.95 i.e. extremely significant. In table no.2 the pain was measured using Wong baker scale before and after the intervention and the p value is <0.0001, the t value is 17.53 and the result is extremely significant.

The studies have stated that trapezius spasm is very common problem in young adults and is the most common musculoskeletal problem in the people with sedentary jobs. College students therefore are susceptible to having trapezius spasm because of hours spent in studying and working on computer. All these activities are done in a static sitting position with the head bent forward. Myofascial Release technique is used treating patients with trigger points on trapezius.

The mechanism of myofascial release technique is to elongate and soften the connective tissue, making permanent three dimensional length and width. MFR acts by relaxing contracted muscles, increasing circulation and lymphatic drainage, and stimulating the stretch reflex of muscles and overlying fascia. This helped to increase soft tissue extensibility which improved range of motion.

The mechanism of long wave diathermy uses high-frequency electric current to produce heat deep inside a targeted tissue and it can reach areas as deep as two inches beneath the skin's surface. As the heat increases, it promotes blood flow and also helps to improve flexibility in stiff joints and connective tissue.

The study conducted by Jay Sata on a Comparative Study Between Muscle Energy Technique and Myofascial Release Therapy on Myofascial Trigger Points in Upper Fibres of Trapezius. The upper trapezius is often placed in a shortened position by poor ergonomics which creates shortness in the muscle. The trapezius is also activated by abnormal breathing pattern and stress. With pain and tightness in the trapezius patients may have neck pain and mid back pain. He observed in his study Myofascial release was better than the muscle energy techniques on myofascial trigger points of upper fibres of trapezius. Garth R Johnson *et al* found that the EMG activity in the upper trapezius was always prevent when isometric loads were applied by shoulder shrugging and isometric pure moments were produced in coronal plane abduction and adduction.

In this present study myofascial release and long wave diathermy was found to be effective on upper trapezius muscle spasm. Therefore the present study rejects the null hypothesis and accepts alternative hypothesis.

6. Conclusion

In this study, it was concluded that Myofascial Release and long wave diathermy was effective on upper trapezius muscle spasm in young adults.

7. Acknowledgement

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8. References

1. Sata J. A Comparative Study between Muscle Energy Technique and Myofascial Release Therapy on Myofascial Trigger Points in Upper Fibres of Trapezius. Indian Journal of Physiotherapy and Occupational Therapy. 2012; 6(3):150.
2. Laura KS, Elizabeth LW, Lehmkuhl LD. "Brunnstrom's Clinical Kinesiology." Davis, FA, 1996.
3. Jette DU, Falkel JE, Trombly C. Effect of intermittent, supine cervical traction on the myoelectric activity of the upper trapezius muscle in subjects with neck pain. Physical therapy. 1985; 65(8):1173-6.
4. Barnes MF. The basic science of myofascial release: morphologic change in connective tissue. Journal of Bodywork and Movement Therapies. 1997; 1(4):231-8.
5. McKenney K, Elder AS, Elder C, Hutchins A. Myofascial release as a treatment for orthopaedic conditions: a systematic review. Journal of athletic training. 2013; 48(4):522-7.
6. Grieve R, Goodwin F, Alfaki M, Bourton AJ, Jeffries C, Scott H. The immediate effect of bilateral self myofascial release on the plantar surface of the feet on hamstring and lumbar spine flexibility: A pilot randomised controlled trial. Journal of bodywork and movement therapies. 2015; 19(3):544-52.
7. Krusen FH. Short wave diathermy; preliminary report, J. Amer. med. Ass. 1935; 104:1237.
8. Valtonen EJ, Alaranta H. Comparative clinical study of the effect of short-wave and long-wave diathermy on osteo-arthritis of the knee and hip. Scandinavian journal of rehabilitation medicine. 1971; 3(3):109-12.
9. Scott PM, editor. Clayton's electrotherapy and actinotherapy. Baillere, Tindall and Cassell, 1968.
10. Gupta N, Gupta S, Agarwal A, Agarwal S, Mahto R. A comparison of visual analog scale and Wong Baker facial pain scale for pain measurement in post lower caesarean section case. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2017; 5(9):3032-5.
11. Rodriguez CS. Pain measurement in the elderly: a review. Pain Management Nursing 2001; 2:38-46.