

EFFECTIVENESS OF LASER THERAPY VERSUS ULTRASOUND THERAPY ALONG WITH KINESIOTAPING ON PAIN AND NECK ROM IN SUBJECTS WITH UNILATERAL UPPER TRAPEZITIS

Physiotherapy

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ABSTRACT

Background: Aim and Objectives: The aim of this study is to compare the effects of Laser therapy versus Ultrasound therapy along with Kinesiotaping on pain and neck ROM in subjects with Unilateral Upper Trapezitis. **Methods:** An Experimental study of 30 individual with trigger points an upper trapezitis were selected as per the inclusion and exclusion criteria and randomly divided into two groups. i.e., group A and group B were 15 subjects in each group. Group A was given Laser therapy with Kinesiotaping and Group B was given Ultrasound therapy with Kinesiotaping for 6days alternatively. The outcome measures are pain intensity using NPRS and Cervical Range of Motion by using measuring Inch tape. **Results:** The results of this study showed that 6 weeks of treatment of both Laser therapy with Kinesio taping and Ultra sound therapy with Kinesio taping have a significant effect in reducing pain, and improving range of motion in subjects with unilateral upper trapezitis, but the Laser therapy with Kinesio taping group shown more significant effect than the Ultra sound therapy with Kinesiotaping group. **Conclusion:** The findings of the study indicate that both Laser therapy with Kinesiotaping and Ultrasound therapy with Kinesiotaping were effective in reducing pain and improving Cervical range of motion in subjects with unilateral Upper Trapezitis, but statistically Laser therapy with Kinesio taping are more effective than Ultra sound therapy with Kinesio taping.

KEYWORDS

Laser therapy, Ultrasound therapy, kinesiotaping, NPRS, Cervical Range of Motion.

INTRODUCTION

When the trapezius muscle becomes inflamed, it is referred to as trapezititis. One commonly overused muscle used for posture is the upper trapezius.^[1]

In order to prepare the clavicle for elevation of the shoulder blade, the upper fibers of the trapezius began to rotate. Any posture that keeps the trapezius shortened for an extended length of time without resting can shorten the fibers, causing discomfort and restriction.^[2]

This issue is more common in professionals who work at desks and computers or in people who drive for extended periods of time, since the upper trapezius muscle becomes uncomfortable and spasmodic. Movement of the neck can cause or exacerbate a persons sensation of stiffness and limited range of motion.^[3]

A Laser can stimulate the vascular system, repair cells, and produce bio stimulative effects on tissues. These lasers are therefore used for acupuncture treatment, pain management, tendon injuries, wound healing, and inflammation reduction.^[4,5]

Three application techniques are available for Ultra sound therapy. It has been shown to be more successful in reducing short term local trigger point sensitivity and to relieve pain, for tissue that is up to 5cm deep, a frequency of 1MHz is utilized and for tissue is 1 to 2 cm deep, a frequency of 3 MHz.^[1]

To promote blood flow and lymphatic drainage, KT treatment works by lifting the skin off the soft tissue underneath. This increases the space between the skin and muscle. The excitatory functions of the CNS may also be changes by KT application. So, in addition to improving the range of motion, KT can be used to manage muscle activity and govern pain.^[6]

Need Of This Study

- There are various studies regarding LASER THERAPY, Ultra sound, Kinesio taping individually. Hence proved that they are effective modes of treatment to relieve pain over a trigger points.
- There was lack of evidence comparing the effect of LASER THERAPY with Kinesio taping and Ultra sound with Kinesio

taping.

- Hence this study was under taken to determine which treatment technique is more effective of LASER THERAPY with Kinesio taping and Ultra sound with kinesio taping on pain and neck ROM of upper trapezitis

Aim Of This Study

The aim of this study is to compare the effects of LASER THERAPY versus Ultrasound therapy along with Kinesiotaping on pain and ROM in subjects with unilateral upper trapezitis.

OBJECTIVE OF THIS STUDY

- To determine the effect of LASER THERAPY versus Ultrasound therapy along with kinesio taping on Pain (NPRS) in subjects with unilateral upper trapezitis.
- To determine the effect of LASER THERAPY versus Ultrasound therapy along with kinesio taping on Neck ROM by (INCH TAPE) in subjects with unilateral upper trapezitis

METHODOLOGY

MATERIALS:

- Measuring tape
- Laser Therapy machine with pair of goggles
- Ultra Sound Therapy Machine (MHZ)
- Ultrasonic gel, cotton gauze
- Plinth, chair with arm rest and back support, pillow
- Kinesio tape, A pair of Scissors

Study Setting: College of Physiotherapy, SVIMS, BIRRD

Study design: Experimental study

Sampling method: Randomized sampling

Sample: 30 [2 groups of 15 subjects]

Sample collection: Population of subjects with Trigger points

Study duration: 6 weeks

Inclusion Criteria

- Age group : 20-35 years
- Both Male and Female
- NPRS>4
- Palpable tender spot in the upper trapezius muscle

Exclusion Criteria

- Recent fall or trauma
- Allergic to Kinesio taping
- Cervical injury

Out Come Measures

- Pain (NPRS)
- Neck ROM (INCH TAPE)

Institutional Ethics Committee Clearance

- The study has been approved by the institutional ethics committee IEC No. 1542, Rec.No.AS/11/IEC/SVIMS/2017.

Procedure

- In this study, total 30 subjects were included. The subjects were recruited from college of physiotherapy, Sri Venkateswara Institute of Medical Sciences, Tirupathi. The subjects had presenting the complains of trapezitis and were screened by the therapists and who filled with inclusion and exclusion criteria were selected for the study. Total 30 participants were included and written informed consent was taken then baseline data and pre intervention assessment was done.
- The subject who had screened, alternatively allocated in two groups in sequence, Group A Laser therapy and Kinesio taping and Group B Ultra sound therapy and Kinesio taping. A total of six sessions were given for three days per week ; for 2 weeks.
- A detailed explanation of the process was given to each participant. The effectiveness of intervention was assessed using the outcome measure, NPRS with the pain intensity and Neck ROM measured by using Inch Tape. All the groups were received intervention for alternative days.
- Patient was positioned comfortably and the painful side and site identified. The site was palpated to determine the presence of Trigger points in Upper Trapezius. A Trigger point was palpated as a tender spot on a taut band of muscles which produces comparable sign and jump sign. The palpable trigger points was marked with a skin mark.

Outcome Variables**1. NPRS (Numerical Pain Rating Scale)****2. Cervical Range of Motion**

To measure Cervical ROM by the Inch tape over the subjects.

Position of the patient:

Position of the subject sitting in a straight back chair with the arms relaxed and resting on the thighs and the back resting against the chair.

Table 1: Shows the statistical analysis of NPRS, Cervical Flexion, Extension, Right and Left Lateral Flexion in subjects with Unilateral Upper Trapezitis

Component	Within groups								Between groups			
	Group A				Group B				Group A		Group B	
	Mean ± SD of pre-test	Mean ± SD of post-test	t-value	p-value	Mean ± SD of pre-test	Mean ± SD of post-test	t-value	p-value	Mean ± SD	p-value	Mean ± SD	p-value
NPRS	8.20± 0.775	2.07±0.799	28.489	0.00	8.20± 0.775	4.40± 1.298	11.148	0.00	6.13±0.022	0.00	3.8± 0.523	0.00
Cervical Flexion	2.87± 0.834	7.67± 0.724	27.495	0.00	2.87± 0.915	5.13± 0.990	19.179	0.00	4.8±0.11	0.00	2.26±0.075	0.00
Cervical Extension	4.47± 0.516	8.20± 0.775	31.588	0.00	4.60± 0.737	6.67± 0.900	13.484	0.00	3.73±0.259	0.00	3.07	0.00
Cervical Right Lateral Flexion	3.07± 0.594	7.13± 0.834	13.544	0.00	3.60±0.632	5.80±0.676	12.602	0.00	4.06±0.24	0.00	2.2±0.044	0.00
Cervical Left Lateral Flexion	2.93±0.884	7.67±0.816	17.75	0.00	4.20±1.014	6.93±0.458	13.252	0.00	4.74±0.068	0.00	2.73±0.556	0.00

Flexion: From Tip of mandible (chin) to Sternal notch.

Extension: From Tip of mandible (chin) to Sternal notch.

Lateral flexion: From acromion process to the lowest point of the ear lobe.

Laser therapy:**Position of the patient:**

- Patient has been instructed to lie prone lying or sitting position during the session. The affected part treated to be exposed and the remaining part was covered.
- During the treatment both physical therapist as well as patient should wore the protective goggles.

Dosage parameters of Laser Therapy

- Wave length 650nm with visible red rays
- Dosage: 12.0J/sq.cm
- Method: Scanning method
- Treatment duration : 12min
- Mode: Continuous

Ultra Sound Therapy**Position of the patient:**

- The patient was sitting on a chair with back rest and forearm supported with pillow.
- The treatment was applied with circular movements on and around the pain area on the trapezius trigger point.

Parameters of Ultra sound therapy

- Frequency: 3MHz
- Mode: Continues
- Intensity: 1W/Cm2
- Duration: 8 minutes

Kinesio taping

- The Kinesio taping was applied on side which is more affected
- Apply the tape fully stretched along its entire length
- The ends of the tape are applied without stretching
- Continue for 2 days. On the 3rd day the tape was removed
- Kept the tape for atleast six hours and for a maximum of 24 hours. Then the tape was reapplied every 48 hours.

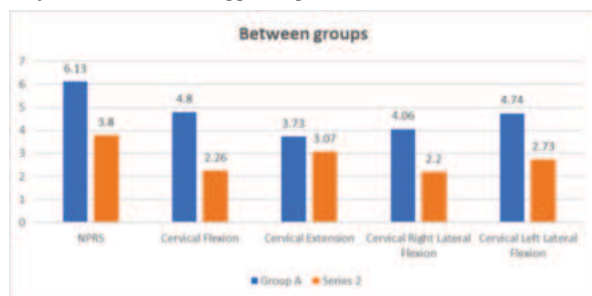
RESULTS

The results were analysed using SPSS software (version 29) for the statistical analysis of the study.

STATISTICS AND ANALYSIS



Graph 1: Shows Pre and Post test mean values of NPRS, Cervical Flexion, Extension, Right and Left Lateral Flexion within groups in subjects with Unilateral Upper Trapezitis



Graph 2: Shows mean values of NPRS, Cervical Flexion, Extension, Right and Left Lateral Flexion between groups in subjects with Unilateral Upper Trapezitis

The above statistical data showed that the pre intervention mean NPRS reduced significantly from 8.20 ± 0.775 to 2.07 ± 0.799 with t-value 28.489 and p-value <0.001 in within group. when compared both groups, group A and B statistically to reduce pain in subjects with unilateral Upper Trapezitis but, group A has shown more effective.

- The pre intervention mean Cervical Flexion increased significantly from 2.87 ± 0.834 to 7.67 ± 0.724 with t-value 27.495 and p-value <0.001 in within group. when compared both groups, group A and B statistically to increase cervical flexion ROM in subjects with unilateral Upper Trapezitis but, group A 4.8 shows more significant than group B 2.26.
- The pre intervention mean Cervical Extension increased significantly from 4.47 ± 0.516 to 7.67 ± 0.724 with t-value 31.588 and p-value <0.001 in within group. when compared both groups, group A and B statistically to increase cervical extension ROM in subjects with unilateral Upper Trapezitis but, group A 3.73 shows more significant than group B 3.07.
- The pre intervention mean Cervical Right Lateral Flexion increased significantly from 3.07 ± 0.594 to 7.13 ± 0.834 with t-value 13.544 and p-value <0.001 in within group. when compared both groups, group A and B statistically to increase cervical right lateral flexion ROM in subjects with unilateral Upper Trapezitis but, group A 4.06 shows more significant than group B 2.2.
- The pre intervention mean Cervical Left Lateral Flexion increased significantly from 2.93 ± 0.884 to 7.67 ± 0.816 with t-value 17.75 and p-value <0.001 in within group. when compared both groups, group A and B statistically to increase cervical left lateral flexion ROM in subjects with unilateral Upper Trapezitis but, group A 4.74 shows more significant than group B 2.73.

DISCUSSION

- The main issue in the trigger point treatment is to provide pain relief on trigger points^[7]. The present study was designed as two group comparative analysis to objectively record the effect of therapeutic Laser therapy versus Ultrasound along with Kinesiotaping in reducing pain and tenderness, improving cervical ROM among cases with trapezius spasm.
- Based on statistical analysis, both group A and B showed reduction in pain on NPRS as well as increased flexibility in their Cervical ranges.
- However, subjects in group A who received Laser with Kinesiotaping showed better improvement in reducing pain in NPRS and increased Cervical ranges on inch tape than the subjects in group B who received Ultrasound Therapy with Kinesiotaping, when both the groups are compared at the end of 2nd week.

- Laser Therapy is an effective as analgesics and to accelerate the healing of injured tissues. Laser therapy promotes blood circulation to the affected area, faster wound healing, alleviating muscle tension, improves ROM of the neck, reducing the pain and inflammation. Laser ability to stimulate the protein synthesis, soft tissue repair and subsequent tissue regeneration.^[8]
- The continuous mode of ultrasound was effective in treating subjects having trigger points for 8mins 0.1-1.5 watts/cm² in the treatment of Upper Trapezitis and found a beneficial effects for subjects. The ultrasound therapy, as a result of neural blockade of the peripheral and sympathetic nerves and release of neuromuscular contractions leading to reduction of muscle spasms. There is a decrease of local edema and reduction of inflammation within hours to days.^[9]
- Kinesiotaping [KT] stimulates alpha, beta mechanoreceptors with slow threshold and increase afferent signals to high levels of CNS and finally blocks the pain receptors result in nerve depolarization and inhibition of pain spasm circle. KT helped to increase the blood and lymphatic fluid circulation, increasing the oxygen supply to the area and removed the accumulated metabolic waste products and helped to reducing the pain on the trapezius muscle^[10]

Limitations Of The Study

- Sample size is small
- Study duration is less
- This study conducted on unilateral side

Recommendations

- The future study is recommended with large sample size.
- The future study is recommended on bilateral side.
- Future study recommended for more than 6 weeks duration for better results.

CONCLUSION

The findings of the study indicated that both Laser Therapy with Kinesio taping and Ultra sound Therapy with Kinesio taping were effective in the treatment of Unilateral Upper Trapezitis..., but statistically Laser Therapy with Kinesio taping showed more effectiveness than Ultrasound Therapy with Kinesio taping. They were effective for 6 weeks of treatment in reducing pain on the NPRS, Increase in ROM in subjects with Unilateral Upper Trapezitis.

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