A Study to Compare Laser Versus and Ultrasound for Subject with Lower Cross Syndrome

Running Title: Laser vs Ultrasound in Lower Crossed Syndrome

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ABSTRACT

Introduction and Aim: A muscle imbalance mostly in the lower extremities is the cause of lower cross syndrome. Stiffness of the iliopsoas, adductor group, and soleus, rectus femoris, and fascia lata tensor were also included. A pressure biofeedback device is used to measure and treat the transverse abdominis muscle. This study is required due to the duration of daily routines and the absence of regular exercise among young people. This produces a muscle imbalance in this population, which increases low back discomfort. The condition can cause pain and discomfort, as well as damage a person's posture and movement. According to this study, poor posture, prolonged sitting, and a range of other factors increase the risk of developing lower cross syndrome in young people.
Objective: To analyse the effectiveness of laser therapy along with experimental group for lower cross syndrome.
To analyse the effectiveness of ultrasound therapy along with conventional group for lower cross syndrome.
Methods: Using inclusion and exclusion criteria, a total of 30 adults with lower cross syndrome had be chosen. They would be split into two groups at random using the lottery method. Conventional (n = 15) and experimental (n = 15) The experimental group had been treated by laser therapy with conventional exercise for lower cross syndrome, and the conventional group had been treated by ultrasound therapy with conventional exercise for lower cross syndrome.

Result: The statistical examination of quantitative studies indicates a legal distinction between the two groups

Conclusion: This research concludes that laser therapy with stretching is more effective than ultrasound therapy with stretching for lower back pain syndrome.

Keywords: Lower cross syndrome, MMT, ultrasound therapy, laser therapy, stretching MQLBPD, Good Health and wellbeing.

INTRODUCTION:

Lower Crossed Syndrome is a neurological disorder defined by a variety of muscle stiffness and weakening patterns. The abdominal, gluteus, and spinal extensors are the muscles that connect the body's anterior and posterior sides. This Unbalanced posture will cause backaches in the future. A weakness of the muscles that support the pelvis causes lower cross syndrome (LCS). The disorder can impact a person's posture and movement, as well as cause pain or discomfort.

Strength training and stretching may be used as part of the treatment [1]. A muscle unbalance between the abdominal and gluteus maximus and medius distinguishes it. The lower kinetic chain is affected by this postural-distortion condition. Most of these people suffer from serious back injuries, piriformis syndrome, and front leg pain [2]. Also implicated are the iliopsoas, gastrocnemius, and soleus, rectus femoris, and tensor fascia lata muscles. It produces anterior pelvic movement, lumbar hyperlordosis, hip flexion, and knee hyperextension. Low-cross syndrome can be induced for a variety of reasons, including chronic, repetitive running activities. Prolonged sitting and improper posture during work can have a major impact on the mechanics of the body, resulting in immobility and persistent structural pain. There are two types of lower back syndrome: hip and lower back. The pelvic, hip joint, and lumbosacral relax as compressed muscles are stretched and muscle strength is strengthened. Some muscles become overactive in order to keep the body safe from damage and discomfort, while others are inhibited [3]. Lower crossover syndrome is a potentially fatal combination of lower back structures and biomechanical muscle dysfunction caused by chronic stress. Lower back pain is typical in those who have an unbalanced posture, and addressing the posture can progress to chronic low back pain that is more difficult to treat later [4]. According to Janda, long durations of sitting at a computer cause the hip flexors to shorten or stiffen. As a result, the opposing gluteus muscles will be suppressed or turned off by the brain. The imbalance pattern allows for increased lumbar lordosis and hip flexor overactivity to compensate for the weak abdominals due to hip flexion contracture and forward pelvic rotation. [5] Ultrasound is energy that manifests itself as sound waves. Physiotherapists commonly use ultrasound therapy to alleviate pain and impairment [6]. Ultrasound is a common non-invasive treatment method in physical therapy.Piezoelectric crystals transform electrical energy into high- frequency alternating currents, which are used in ultrasound probes. Heat and non-heat effects of therapeutic ultrasonography muscle relaxation, tissue regeneration, and inflammation decreased [7-10].

Laser therapy is a procedure that involves cutting, burning, or destroying tissue with a powerful beam of light. Light amplification through stimulated emission of radiation is called a laser. The laser light beam poses no danger to the patient or the medical team. Pain, bleeding, and scarring are all concerns associated with laser treatment, just as they are with open surgery. However, laser operation recovery is generally quicker than open surgery recovery. Lasers can be used in a range of medical applications. Because the laser beam is so narrow and exact, medical workers can carefully treat tissues without causing injury to the surrounding region [11,12] School-aged youngsters aged 11 to 15 years sit for long periods of time, causing hip flexor muscle tightness and gluteal muscle lengthening. Lower cross syndrome develops as a result of abdominal muscle weakness and back muscle tension. Lower crossing syndrome was shown to be frequent in 21% of the total cases. Lower crossing syndrome will eventually affect 29% of the population. Lower crossing syndromes are found in 22 percent of male patients and 18 percent of female subjects [13].

METHODOLOGY:

A total of 30 young children with lower cross syndrome were selected. Age between 10 and 15.Both genders were selected as asymptomatic individuals, and the patients were eager to participate. Chronic low back discomfort, neurological deficits, breathing problems, and uncooperative patients who are unwilling to participate were all excluded as exclusion factors. After obtaining informed written consent from the selected participants. They will be randomly divided into 2 groups using the lottery method. The experimental group will have 15 participants, and the conventional group will have 15 participants. The experimental group has been given laser therapy, and the conventional group has been given ultrasound therapy along with conventional exercise. The exercises are seated glute stretch, pigeon pose, quadriceps stretch exercises, and cobra stretch. All the participants were evaluated by MMT (Manual Muscle Test) and the Oswestry low back pain disability scale. Finally, pre and post-test measurements were evaluated by an investigative physiotherapist.

Procedure:

Pigeon Pose: Then come onto your fingertips, stretch your spine, draw your navel in, and open your chest as you inhale. Exhale and walk your hands forward while lowering your upper body to the floor. Your forearms and forehead can rest on the mat. Stay for 5 or more breaths. Lie on your stomach.

Cobra stretch: Place your palms just below your shoulders on the floor. Firm and stretch your legs, and bring your

tailbone back. Lift your navel gently and begin to drag your hands against the mat. Lift your chest forward and up, straightening your arms as much as possible without putting tension on your back.

Seated glute stretch: Sit with your feet extended out in front of you on the floor. Keep your back straight while lifting your left leg and resting your left ankle on your right knee. To deepen the stretch, lean forward slightly. Hold for 20 seconds, then switch sides and repeat.

Quadriceps Stretch Exercises: To keep your balance while standing, grab a countertop or the back of a chair. With one hand, grip your ankle and bend your knee backwards. This will assist you in bending your knee as far as you can. 30 seconds in the same position. Return to your original standing position. With each leg, repeat the exercise 3 to 5 times.

STATISTICAL ANALYSIS:

The data was tallied and statistically analyzed by inferential statistics and descriptive statistics. All parameters were given a standard deviation and mean. The paired t-test was performed to see if there were any notable differences between the pre and post-test calculations. The unpaired t test was performed to compare important differences between groups. A statistical significance of a P value of 0.005 was determined.

RESULT:

Table 1: Comparison of Pre-test and Post-test value of experimental Group using MQLBPD

Experimental group	Mean	SD	T-value	P- value
Pre- test	75.87	4.44	56.5386	<0.0001
Post-test	44.27	3.01		

Table 2: Comparison of Pre-test and Post-test value of conventional Group using MQLBPD

Conventional group	Mean	SD	T-value	P-value
Pre -test	76.27	3.37	27.1137	<0.0001
Post-test	48.67	5.59		

Table 3: Comparison of Post-test value of experimental group and conventional group using MQLBPD

Groups	Mean	SD	T value	P value
Experimental	44.27	3.01		

Conventional	48.67	5.59	2.6848	0.0121

The quantitative data analysis revealed statistically significant differences in the values of both groups. Table 1 provides a comparison of the experimental group's pre-test and post-test values. The pre-test values of the foot functional index scale were (75.87), which decreased to (44.27) in the post-test. As a result, the results are statistically significant with a p value of 0.0001. Table 2 shows the comparison of pre-test and post-test values of the conventional group. The pre-test values of the foot functional index scale were (76.27), which decreased to (48.67) in post-test value. As a result, the results are statistically significant with a p value of 0.0001.Table 3 shows the comparison of post-test values of experimental and conventional groups. The experimental group's post-test value is 44.27, which is decreased to 48.67 in the conventional group. As a result, the results are statistically significant with a p value of 0.0121.

DISCUSSION:

One explanation is that LLLT raises the nociceptive threshold, causing neural blockade, specifically inhibition of A and C neural fibers [14-15]. Painful mechanical and chemical impulses are converted to electrical impulses by nociceptors in the peripheral termination of very poor and marginally insulated walls, respectively. The electrical signals are subsequently transferred to the dorsal horn of the spinal cord, where they are altered and regulated before being projected to the brain. Physiologic pain, sometimes called "ouch" pain, is a type of nociceptive pain that prevents tissue damage in the recipient [16-18] Improved blood flow, reduced muscular spasm, increased collagen fibre extensibility, and a proinflammatory response are some of the physiological effects of ultrasound on tissue [19]. One of the most common causes of low back pain in youngsters is muscle imbalance. LCS is defined by low back muscles and abdominal muscles, as well as gluteus maximus muscle weakness, all of which impact lower back kinematic force distribution and may contribute to persistent low back pain [20,21] Muscle tightness is generated by a rise in tension in the general population, which can be caused by active or passive sources. Muscles can get shorter when they are active due to spasm or contraction [22]. The study looked at the efficacy of radiation therapy combined with lower extremity exercises. The total number of patients was separated into three groups: those who received LLLT, those who received placebo LLLT, and those who received LED treatment. With the universal goniometer, the VAS was utilised to determine functional ability.VAS and ODI improved statistically significantly in groups. There were variations in radicular pain and ODI among groups [23].In children with ASD, TSC, or SMS, there were no links found between age and sleep problems. However, there are specific characteristics that lend weight to previous research [24,25]. We found that delays were visible by 6 months of age, with a significant drop in the rate of development over the first two years in infants with FXS that was not seen in the other groups [26] Hunt and Stores (8) discovered that children with TSC have more settling and night waking disturbances than children with an intellectual handicap of other origins and normally developing youngsters. Variations in findings between the current study and Hunt and Stores' 1994 study could be attributed to sample size differences; the current study included 20 parents of children with the TSC, whereas Hunt and Stores' study included 40 parents [27]. According to Mills M et al., decreased hip flexor muscle length is likely reduce neuronal hip extensor muscle. Lower extremity injuries have been linked to gluteus maximus reciprocal inhibition as a result of "hyperactivity" of the hip flexor muscle Reciprocal inhibition is hypothesized to increase secondary hip extensor group [28].Muscles such as the hamstrings and hip adductors create hip extension torque, a condition defined in clinical terminology as synergistic dominance [29-31]. Janda noted that muscles in dysfunction are weak. Because of the pressure caused by inadequate structure, they are prone to stiffness. Muscles that are prone to stiffness are often found to be weak, while muscles that are weak are often found to be tight. According to Janda's, hip flexors and spinal extensors are stiff due to their tonic nature, while gluteus maximus and abdominal muscles are weak due to their phasic nature [32,33]. In general, females had less total muscle mass than males [34] Reduced iliopsoas muscle length and strength are, according to Ashmen K J et al (1996), the most common causes of low back pain because the iliopsoas connects the pelvis to the lumbar spine. Tightness generates increased lumbar lordosis and weakness causes decreased lumbar lordosis, which can lead to LBP [35]. Tight hip flexors can take over abdominal function, making some abdominal workouts practically impossible due to agonist-antagonist interaction. Tight hip flexors lead to their primary hip extensors stretching or weakening [36].Kendall believes that weaker abdominal muscles and prolonged sitting positions

cause stress on the back extensor muscles. The length of the back extensor muscles and the power of the hip extensor muscles have a strong but shaky association [37].This shows the comparison of post-test values between the experimental and conventional groups. The experimental group's post-test average was 44.27, which was decreased to 48.67 in the conventional group. As a result, with a p value of 0.0121, the results are declared statistically significant.

CONCLUSION:

This research concludes that laser therapy with stretching is more effective than ultrasound therapy with stretching for lower back pain syndrome.

CONFLICT OF INTEREST: Nil

SOURCE OF FUNDING: Nil

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