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Effects of Laser and Sacroiliac Joint Mobilization for Sacroiliac Joint Dysfunction

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Abstract

To evaluate the effects of laser and sacroiliac join mobilization for sacroiliac joint dysfunction.The SI Joint`s primary functions are to provide to distribute trunk load to the lower limbs. Lowback discomforts are frequently caused by sacroiliac joint dysfunction (SI) Joint, which can bedifficult to diagnose. Prolonged standing or sitting postures can also make pain worse. Low Intensity Laser Therapy also known as Low Level Laser Therapy is thought to work by inducing a photochemical-reaction (Response) to light (Laser) Physiotherapist frequently Recommend spine mobilization to treat Musculoskeletal Problems. The Amplitude of Oscillating mobilization can be classified as considerable (GradesII and III) or little (Grades I and IV) depending on the possible range of motion. 5 Large amplitude oscillations excite more mechanoreceptors and hence reduce pain more effectively than small amplitude oscillations. To evaluate the effects of laser therapy and laser therapy with sacroiliac joint mobilization in patient with sacroiliac joint dysfunction. The total number of test subjects was 40. The Group(A) 20 Samples) and Group(B) 20 Samples, both groups pre and post-test values noted NPRS scale. Group-A Laser therapy was given by patient being in prone lying position and Group-B Laser therapy with sacroiliac joint mobilization techniques was given in being pronelying position. Both Groups treatment Will be given 4 weeks for Thrice a week for 30 minutes. This study was conducted as a experimental study. The sample were collected by convenient sampling technique. The data that had been gathered was statistically analyzed using an unpaired t-test. Compared to the laser group, the Laser with sacroiliac joint mobilization group exhibits significant effects in lowering pain and improving physical functional activity, as assessed by NPRS scale. It is concluded that laser therapy with sacroiliac joint mobilization technique was found to be more effective than laser therapy in sacroiliac joint dysfunction.

***Key Words*:** Sacroiliac joint dysfunction, Laser, Maitland mobilization Technique

1.INTRODUCTION

The SI joint articulates the sacrum and ilium surfaces and serves as a transition between the spine and the pelvis. The SI joint's primary functions are to provide stability and to distribute trunk load to the lower limbs. A large architecture of ligamentous structures provides support to the joint. [1] The articular surfaces are enclosed by a fibrous capsule that contains synovial fluid, making it a real diarthrodial joint [2]. Due to its anatomical connections, a tight hamstringmuscle may act as a compensation strategy to stabilize the sacroiliac (SI) joint in those with weak gluteal muscles and dysfunction of the SIJ.[3] The most frequent complaints are pain in the hip, buttocks, leg, groin, and lower back. (4)The most frequent cause of low back pain in adults is sacroiliac joint dysfunction. Pain between the gluteal fold and posterior iliac crest, specifically in the location of the sacroiliac joint, is a sign of sacroiliac joint dysfunction. The posterior thigh may feel the ache. The ability to stand, walk, and sit for long periods of time isreduced.[4] ·Pain and localized discomfort are the primary clinical symptoms of sacroiliac jointdysfunction, and pain is aggravated by changes in posture, such as standing up from a seated or laying position or climbing stairs or slopes. Prolonged standing or sitting postures can also make pain worse.[5] The differential diagnosis of lumbar pain includes the examination of the SI joint within the context of mechanical discomfort has not advanced to date, despite the fact that any doctor evaluating patients' vertebrae will commonly encounter SI joint dysfunction (SIJD) and SI joint discomfort.[6] Tests such as the FABER, compression, distraction, and thigh thrust are among the physical examination's provocative tests for SIJ dysfunction..[7] The term "laser" was first used by Theodore Mailman to describe a ruby laser in 1960. Lasers are devices that typically produce electromagnetic radiation that is relatively homogeneous in wavelength, phase, and polarization. Low level lasers have the following characteristics, according to Postern et al.: a) Lasers have a power output between 0.001 and 0.1 Watts') A wavelength between 300 and 10,600 nanometers') Pulse rate ranging from zero, which denotes continuous,to 5000 Hertz (cycles per second). d) A dosage of 0.01 to 100 J per cm2 and an intensity of 0.01 to 10 W. [8]

LLLT produces a single wavelength of light and is a non-invasive light source treatment. It produces no vibrations, noise, or heat. It is also known as bio stimulation or photo-biology. [9] Low-level laser illumination (coherent, monochromatic, and polarized light) used for therapeutic purposes. [10] and by applying Maitland mobilization, passive physiological movements, and accessory oscillatory motions to the joint, one can regain range of motion that has been lost because of pain or stiffness and improve the kinematics between the joint surfaces. The level of irritation, frequency, and dosage of mobilization are all determined on the disorder's severity, irritability, and nature (SIN).. [11]

The oscillatory amplitude of mobilization can be categorized as big (grades II and III) or little (grades I and IV) based on the range of motion that is being used. Because they do not stimulate as many

mechanoreceptors as large-amplitude oscillations do, small-amplitude oscillations are less effective at relieving pain than large-amplitude oscillations.[12]

According to Maitland's methods, stiffness and pain in the spinal and vertebral joints are treatedby applying passive and active oscillatory motions.[13] A grade I movement, which has a smallamplitude and is used below the range of resistance, is appropriate for treating irritable symptoms. By focusing on neurological structures, Grade I can reduce pain by providing the collagen to fill the gaps when connective tissue is not under strain.[14]A Grade II mobilizationhas a larger amplitude but is still below resistance. When palpation results in pain before a restriction of mobility,Grade I and II should be used. When pain comes before resistance to movement, Grades III and IV are utilized. A Grade III is a large amplitude movement carried out against resistance and typically used to increase range of motion. For chronic aches with mild irritation, Grade IV is a little amplitude movement carried out against resistance. A high-velocity push known as Grade V is employed for manipulation.[15]

Treatment includes applying Maitland's mobilization methods

1. Opening anterior surfaces = Patient is lying supine. anterior surfaces of bothsacroiliac joints will be subjected to an opening stress by the therapist. The therapist stresses the anterior sacroiliac joint by pushing his hands apart to create oscillatory movement.

2. Opening the patient's posterior surfaces while they are supine. By placing both hands on thepatient's pelvis laterally, the therapist oscillates the patient while applying pressure to the posterior S.I joint.

The therapist applies direct pressure over the upper Sacrum and the Ilium while patient is lying face down. He starts by placing his hands in the middle of the area. Up until the distal end of the sacrum, all levels of the spine are subjected to oscillatory pressure beginningat the S1 level. The anterior joint is compressed and stressed by the strain applied to the back.

1. While the patient is laying on the other side, the upper pelvis tilts backward. The knee and hip were bent 90 degrees. The therapist stands in front of the patient and lays his right hand over the posterior aspect of the left Ischial tuberosity with the fingers and forearm pointing over the patient's hip in the direction of the therapist's face. He does the same with his left hand over the patient's ASIS. Due to the patient's ASIS being pulled up and backwards and the patient's Ischial tuberosity being pushed forward, this position puts a rotational pressure on the patient's SI joint..

2. The patient tilts the upper pelvis forward while the therapist places his left hand's heel against the posterolateral margin of the iliac crest. The upper pelvis is tilted forward, and the therapist'sfingers are pointing upward, containing around the Ilium, and cupping his right hand's palm over the left ischial tuberosity. His fingers are also joint backwards over the patient's buttock.[16]

2. Body of Paper

Methodology:

In this study ,40 samples have been selected under inclusion and exclusion criteria by the convenient sampling technique. Informed consents were obtained from the subjects anddetailed procedure were explained. The study was conducted in Saveetha college of physiotherapy, Thandalam-Chennai. The samples were observed in a time period of 2months.The required samples will be divided into 2 groups (Group A and Group B). The Group(A) 20 Samples) and Group(B) 20 Samples, both groups pre and post-test values noted NPRS scale. Group-A Laser therapy was given by patient being in prone lying position and Group-B Laser therapy with sacroiliac joint mobilization techniques was given in being pronelying position. Both Groups treatment Will be given 4 weeks for Thrice a week for 30 minute

REVIEW OF LITERATURE

1) Faryal Zaidi, Ishaq Ahmed etal In 2020, conducted a Randomized controlled trail on “Muscle Energy Technique's effectiveness in treating chronic sacroiliac joint dysfunction compared to Maitland Mobilization” and the Author Concludes in his Study that was clear from the results of the current study that, when lumbopelvic stability exercises were used as an adjunct therapy, MET and Maitland mobilizations were both beneficial in treating chronic SIJD in terms of reducing pain and disability .

2) Kaushik Guha IJMAES et Al In 2016 Conducted a Purposive sampling on “Maitland Mobilization's Impact on People with Sacroiliac Joint Dysfunction” and the Author Concludes in his study that According to the study's findings, Maitland's mobilization is a very successful method for treating sacroiliac joint problems.

3) Sara Mohamed Samir, Lilian Albert ZakY et Al In 2016 Conducted a Randomly Assigned Study on “Mulligan Versus Maitland Mobilization in Patients with Chronic Low Back Dysfunction” and Author

Concludes in his StudyIn individuals with CLBD, it has been demonstrated that the Mulligan and Maitland treatments are both beneficial at lowering pain levels and restoring ROM (chronic low back dysfunction)

4) Kanchan Rana1, Nitesh BansaF, et Al In 2009 Conducted a Randomized Experimental Study "Comparative analysis on the Efficacy of GD Maitlands Cofiee of Mobilization of Muscles Energy Technique in treating Sacroiliac Joint Dysfunction," the author states that the findings "show that Muscle Energy Technique (MET) along with active exercises is moderately significant over the G.D. Maitland's technique of mobilization in improving functional ability and increasing the medial rotation of the hip joint in mechanical chronic low back pain."

INCLUSION CRITERIA:

1.People between age group 20-40 years**.**

2. Both male and female sacroiliac joint dysfunction.

3. Low back pain

4. Patient with sacroiliac joint strain

5. Buttock pain and Groin pain

6. Difficulty and Discomfort in sitting position

7. Back of thigh pain and knee pain

EXCLUSION CRITERIA:

1. Recent low back injuries.
2. Surgery in sacroiliac region.
3. Hypertension.
4. Infection or tumor of the sacroiliac region

STATISTICAL ANALYSIS:

The data obtained is tabulated and analyzed. Mean and Standard Deviation (SD) are the parameters used. The significant changes between pre-test and post-test values were assessed using

Paired t – test. The unpaired t-test was used to calculate the difference in efficiency between the laser therapy group and mobilization group for SI joint Dysfunction.

RESULT:

Quantitative data analyzed statistically revealed statistically significant variations within each group as well as between the Laser and laser with sacroiliac joint mobilization groups.

DISCUSSION:

This study goal is to establish if laser therapy and Sacroiliac joint mobilizations technique is more beneficial effects for Sacroiliac joint dysfunction. The sample will be required from saveetha physiotherapy OPD department. The sample size is 40 this group divided in to 2 groups(group A and group B) i.e laser therapy group A and the sacroiliac joint mobilization for group B . Lasers are devices that typically produce electromagnetic radiation that is relatively homogeneous in wavelength, phase, and polarization. Low-level laser treatment (LLLT) or low-power laser therapy, is thought to work by inducing a photochemical reaction (response) to light (laser) Physiotherapists frequently recommend spine mobilization to treat neuromusculoskeletal problems.

The ultra-structure of the cells in culture is unaffected by laser irradiation, but it has a demonstrable in vitro impact on the metabolism and surface charges of the cells. Low power laser irradiation has been the subject of numerous investigations, which are becoming more comprehensive and numerous.The metabolism and surface charges of cells in culture are demonstrably affected by laser irradiation in vitro, while the ultra-structure remains unaffected.The quantity and breadth of studies looking at how low power laser irradiation effectsbiological function are expanding.

Although many tests suggest pain relief, the quality of the studies, the sample size, and the variety of approaches generally prevent statistical validation. It was determined that oscillatory mobilization and self-mobilization of the SIJ increased the PPT over lumbosacral soft tissues on the mobilized side. This study demonstrates that SIJ mobilisation on asymptomatic volunteers results in a rapid and significant improvement in PPT measurements.also we collected data stated that the laser and sacroiliac joint mobilization is effective in reducing pain and increasing functional mobility among individuals with sacroiliac joint dysfunction.

In 2016 Kaushik Guha IJMAES et Al, According to the study's findings, Maitland's mobilisation is a very successful method for treating sacroiliac joint problems.

In 2016 Sara Mohamed Samir, Lilian Albert ZakY etAl, In individuals with CLBD, it hasbeen demonstrated that the Mulligan and Maitland treatments are both beneficial at lowering pain levels and restoring ROM (chronic low back dysfunction).

In 2004 Kanchan Rana1, Nitesh BansaF, Savita et Al, The results of this study showed that, in mechanical chronic low back pain caused by sacroiliac joint dysfunction, Muscle Energy Technique (MET) combined with active exercises is moderately significant over G.D. Maitland's technique of mobilization in improving functional ability and increasing the medial rotation of the hip joint, while both the experimental groups were highly significant in reducing pain and improving functional ability. This study came to conclude that laser therapy and Sacroiliac joint mobilization is more beneficial to a patient ability to function during sacroiliac joint dysfunction.

LIMITATIONS AND RECOMMENDATIONS:

The study was done in a short time period with a small number of subjects. Furthermore, studies were needed in the future to find out the effects of laser and sacroiliac joint mobilization forsacroiliac joint dysfunction.

TABLE 1: COMPARISON OF PRE AND POST TEST VALUES FOR GROUP A

GROUP A	MEAN	SD	SEM	t value	P value
Pre test	8.95	0.94	0.21		
Post test	6.05	1.15	0.26	8.0108	< 0.0001

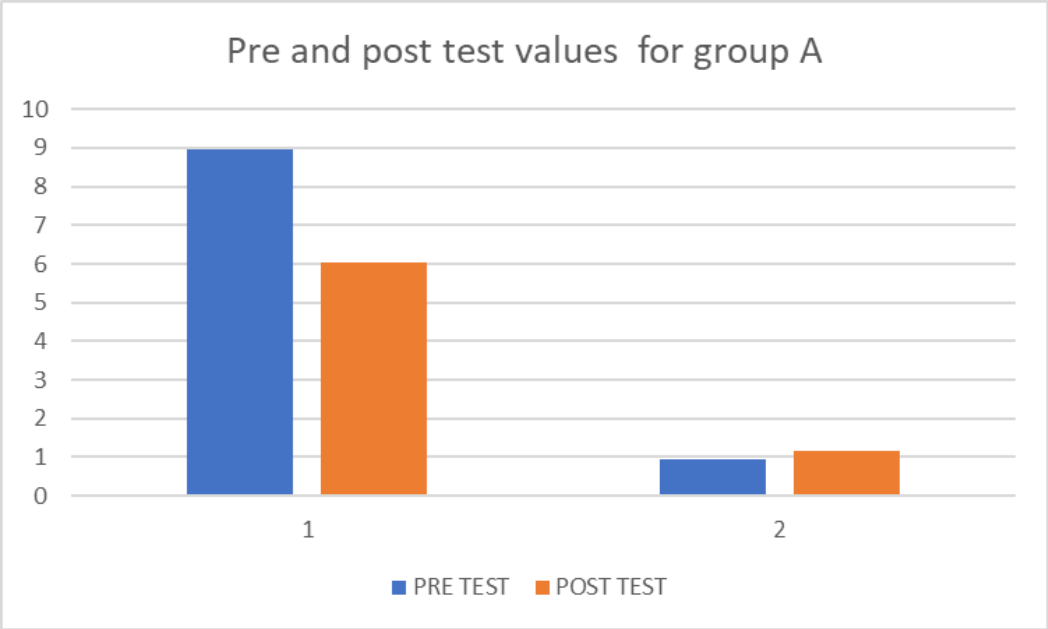
TABLE: 2 PRE AND POST-TEST VALUES FOR GROUP B

GROUP B	MEAN	SD	SEM	t value	P value
Pretest	8.85	0.75	0.17		
Post test	3.75	0.79	0.18	23.5642	< 0.0001

TABLE:3 post-test values for group A and B

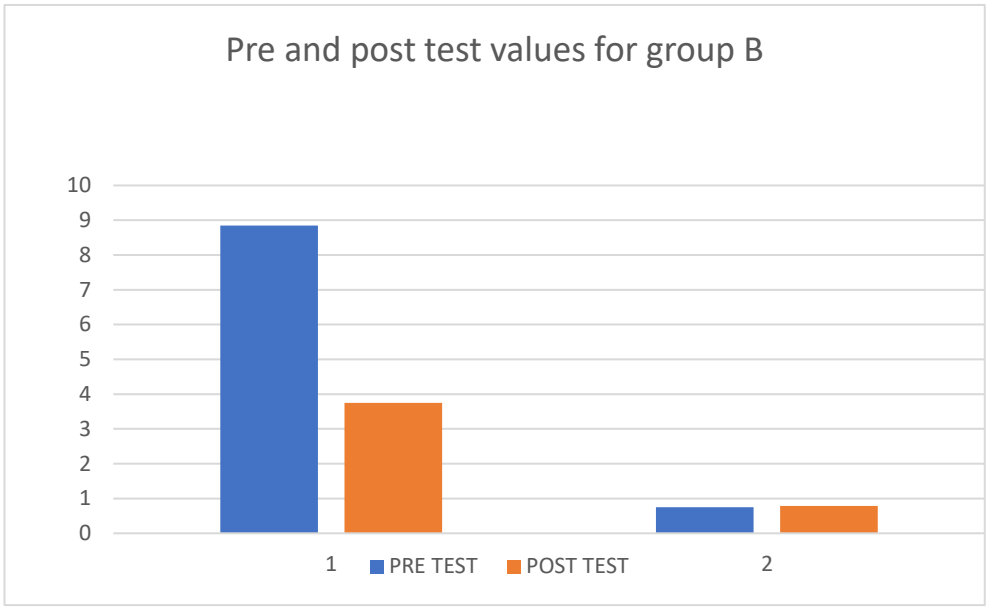
GROUP(A&B)	MEAN	SD	SEM	t value	P value
Post test	6.05	1.15	0.26	7.4009	< 0.0001
Post test	3.75	0.79	0.18		

GRAPH:1 COMPARISON OF PRE AND POST TEST VALUES FOR MOBILIZATION (GROUP A)

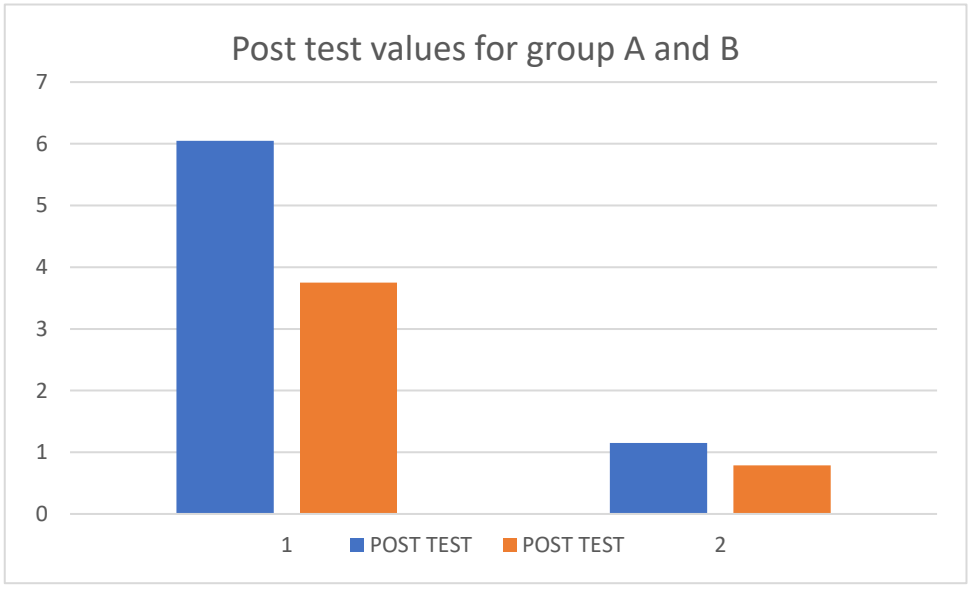


GRAPH :2 COMPARISON OF PRE AND POST TEST VALUES FOR MOBILIZATION

GROUP B



GRAPH:3 COMPARISON OF POST TEST VALUES FOR (GROUP A & B)



3.CONCLUSION:

This study has concluded that laser therapy with sacroiliac joint mobilization technique was found to be more effective than laser therapy in sacroiliac joint dysfunction.

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