Med. J. Cairo Univ., Vol. 92, No. 4, Accepted 24/6/2024
DOI: 10.22608/MJCU. 1215-1223, December 2024
www.medicaljournalofcairouniversity.net

Therapeutic Ultrasound Versus Low Level Laser Therapy on Postpartum Sacroiliac Joint Pain

MOHAMED IBRAHIM SEIF ELDIEN, M.Sc.*; MAGDA S. MORSY, Ph.D.* and
HOSSAM EL-DIN H. KAMEL, M.D.**

The Department of Physical Therapy for Women Health, Faculty of Physical Therapy, Cairo University and Department of Obstetrics & Gynecology, Faculty of Medicine, Al-Azhar University***

Abstract

Background: Women are more prone to sacro-iliac joint (SIJ) pain during pregnancy and after childbirth. The hormonal changes during pregnancy and lactation make all ligaments of the woman's body more lax and more flexible, this in turn can leave the SIJs too mobile and can cause inflammation and pain in SIJ. So, it is necessary to decrease pain in Sacroiliac joints.

Aim of Study: To compare between the efficacy of Low-level laser therapy and Ultrasound therapy on Sacroiliac joints pain after delivery.

Patients and Methods: This study was carried out on Forty multiparous women suffering from Sacroiliac joints pain (for at least 3 months after delivery), they were selected randomly from the outpatient clinic of orthopedic at El Sadat General Hospital, Al-Monofia. They were divided randomly into two groups equal in number as group A and group B. Group (A) was consisted of 20 patients, each patient in this group had received low level laser therapy on her two SIJS for 180 seconds (90 seconds on each sacroiliac joint), 3 times/week for 4 weeks. Also, each patient was asked to perform core strengthening exercises, posterior pelvic tilting and posture correction exercises for 60 minutes, three times per week for 4 weeks. On the other hand, each patient in this group was advised to wear a sacro-iliac belt all the day and take it off only during sleep and taking a shower throughout the treatment course (4 weeks). Group (B) was consisted of 20 patients, each patient in this group had received therapeutic ultrasound on her sacroiliac joints for 10 minutes (5 minutes on each sacroiliac joint), 3 times/week for 12 weeks. Also, each patient was asked to perform core strengthening exercises, posterior pelvic tilting and posture correction exercises for 60 minutes, 3 times per week for 4 weeks. On the other hand, each patient in this group was advised to wear a sacro-iliac belt all the day and take it off only during sleep and taking a shower throughout the treatment course (4 weeks). Each patient in both groups (A&B) was evaluated through Visual Analogue Scale (VAS) and measuring serum cortisol level in blood plasma before and after the treatment course.

Results: Both groups showed a statistically significant decrease in both visual analogue scale and serum cortisol level after treatment, Group (A) achieved a percentage of decrease in visual analogue scale about 81.01% and achieved a percentage of decrease in serum cortisol level about 64.45% while group (B) achieved a percentage of decrease in visual analogue scale about 29.45% and achieved a percentage of decrease in serum cortisol level about 28.88%. By comparing 2 groups (A&B) it was found that percentage of decrease in VAS and serum cortisol level in group (A) was more pronounced and more noticeable when compared with group (B). This means that low level laser therapy was more effective than therapeutic ultrasound in relieving sacroiliac joints pain after delivery.

Conclusion: Low level laser therapy was more effective than therapeutic ultrasound to relieve SIJs pain after delivery.

Key Words: *Low level laser therapy – Therapeutic Ultrasound – Sacro iliac joint pain – Visual analogue scale (VAS) – Cortisol level in the blood.*

Introduction

IN general, women are 8 to 10 times likely to experience SIJs pain and dysfunction than men due to the differences in their anatomy and body chemistry. Also, some studies have shown that, the younger woman has a greater risk of developing SIJs pain than the older one **[1].**

On the other hand, the incidence of SIJs pain after delivery is very high and is more than we might think, since about 15-30% of postpartum women have SIJ pain. The pain starts when the mother's SIJs get inflamed. The SIJ pain can increase the risk of low back pain after delivery **[2].**

The main cause of SIJs pain after delivery is the hypermobility and instability of SIJs. Hypermobility of SIJs caused by the pregnancy hormones causes an alteration in the normal joint motion (too much

Correspondence to: Dr. Mohamed Ibrahim Seif Eldien, The Department of Physical Therapy for Women Health, Faculty of Physical Therapy, Cairo University

movement) which in turn causes instability in SIJs. About 30% of SIJ patients have postpartum instability in their SIJs so, they experience SIJ pain after delivery [7].

Core weakness or muscle imbalances and sacro-iliac dysfunction can also be the main cause of SIJs pain and LBP after delivery [9].

There are other factors causing SIJs pain additionally to hypermobility of the joints caused by pregnancy hormones like falling down. The mother might also get this problem, from an activity that gives the area a regular pounding like jogging or if she has one leg longer than the other that could be a cause of SIJs pain. Arthritis can also lead to SIJs pain (a type that affects the spine called ankylosing spondylitis can damage the SIJ). SIJ pain can also occur when the cartilage over the joint slowly wears away by aging [5].

SIJs pain may occur at any time during pregnancy and becomes more intense as the pregnancy progresses. This pain usually spontaneously resolves within 3 months after delivery. But, in some cases it can become chronic and disabling [6].

There are many choices for treating SIJs pain. The first step is simply to stop any activities that make the mother hurt. The doctor will tell her to lay off any movement or sports that inflame her joints. She may also prescribe some pain drugs. Oral anti-inflammatory medications are often effective in pain relief. Anesthetics and steroidal injections into the SIJs are other alternative treatments that can help in pain relief, but these two treatments are contra-indicated during pregnancy. In rare cases, if the mother is still hurting, the doctor may recommend surgery, in an operation called sacro-iliac fusion, a surgeon uses pins and implants to join the bones near the joints [3].

Physiotherapy and exercises that focus on core stability of the trunk and pelvic girdle are considered the main line of treatment for SIJs pain. Sometimes a sacro-iliac belt is prescribed to complement the core stability exercises and to give quick pain relief [8].

Beside the core stabilizing exercises and sacro-iliac belt, the physiotherapist can use other physical therapy modalities to reduce inflammation and relieve pain in SIJs after delivery such as Pulsed electromagnetic therapy, Shockwave therapy, Therapeutic ultrasound, Laser therapy, Tens, Interferential current, Shortwave diathermy, Electro-acupuncture, Neuromuscular electrical nerve stimulation, Dia dynamic current, Infra-red radiation, Heat & Cold therapy, Kinesio taping, Myofascial release, Bioptron, Radio frequency, Massage therapy and Manual therapy such as Muscle energy technique, Mulligan technique and Manual manipulation [4].

To explain the bio stimulation effect of LLLT, Karu proposed a chain of molecular events starting with the absorption of light by a photoreceptor and leading to the photoactivation of enzymes in the mitochondria, including the signal transduction and amplification events, and ending with the photo response. Light is absorbed by components of the respiratory chain, which leads to changes in both the mitochondria and the cytoplasm. At low-laser doses, additional Ca2+ is transported into the cytoplasm by an antiport process that triggers or stimulates various biological processes such as DNA and RNA synthesis, cell mitosis, and cell proliferation. At higher doses, too much Ca2+ is released, which results in hyperactivity for the calcium-adenosine triphosphatase (ATPase) calcium pumps and exhausts the ATP pool of the cell, thereby inhibiting cell metabolism [17].

LLLT has a high beneficial effect on nerve cells which block pain transmission to the brain (close pain gait). Another pain blocking mechanism involves the production of high level of natural pain killing chemicals such as endorphins and enkephalins from the brain and adrenal gland through stimulating descending inhibitory system [11].

LLLT has an anti-oedema effect as it causes alternation in cell membrane permeability, vasodilation in blood vessels and activates lymphatic drainage system (drains swollen area) as a result, there is a reduction in swelling caused by inflammation [12].

LLLT generates simultaneous ant-inflammatory and analgesic effects. It reduces inflammation, swelling and pain. The anti-inflammatory effects of LLLT work at the cellular level. Laser does not suppress inflammation, but it stimulates the body s' cells to reduce inflammation, swelling and pain. 90% of patients who had SIJs pain reported an improvement and solution of pain after low level laser therapy [13].

LLLT has become a popular technology, it is used to treat a variety of conditions because it showed strong evidence of effectiveness in pain relief. LLLT synchronizes continuous and pulsed emission of light waves to generate simultaneous ant-inflammatory and analgesic effects. Several studies had confirmed that LLLT is beneficial in treating pain and inflammation in SIJ pain. All results of these studies showed a statistically significant decrease in VAS scores and high percentage of improvement in hand grip muscle strength after laser therapy [14].

In SIJs pain it is best to administer LLLT treatment as soon as possible for faster recovery. The sooner the inflammation is reduced, the pain is relieved, the earlier the recovery process can begin. For those who have SIJs pain, laser therapy can help to address persistent pain and inflammation associ-

ated with them. So, no need for medication or surgery **[18].**

It is approved that, LLLT has anti-inflammatory effects, anti-edematous effect, it closes pain gait and stimulates natural pain killer chemicals, such as endorphins and enkephalins. So due to less inflammation, there is less oedema and less pain. For this reason, LLLT is usually recommended to treat SIJs pain **[16].**

Low level laser therapy is the fastest physical therapy modality to relieve pain and reduce inflammation as well as swelling in SIJs pain. After the first session of LLLT patients feel better and good with no pain and tenderness **[10].**

Laser therapy uses a process called photo biomodulation. Photons enter the tissue and interact with the cytochrome c complex within mitochondria. This interaction triggers a biological cascade of events that leads to an increase in cellular metabolism and a decrease in both pain and inflammation. Unlike medications, laser therapy reduces pain without undesirable side effects. After laser therapy, patients with SIJs pain report long-acting pain relief. Many patients experienced long lasting pain relief after only a couple of treatments. LLLT is particularly effective when it is administration as soon as possible following injury. The faster the inflammation is reduced and the healing process can begin. LLLT helps to restore normal function of the affected hand quickly. LLLT is the best modality to treat SIJs pain, it gives amazing results **[15].**

Ultrasound is commonly used for musculoskeletal disorders by health professionals such as physiotherapists, osteopaths, chiropractors, and sports therapists. However, the effectiveness of ultrasound for musculoskeletal problems remains controversial. Previous systematic reviews on the effects of ultrasound therapy for different musculoskeletal disorders found that there are few studies on this topic and that there is a dearth of evidence regarding its usefulness in the treatment of shoulder disorders, degenerative rheumatic disorders, and myofascial pain **[19].**

Ultrasound (US) is a form of mechanical energy, and therefore not really electrotherapy, but does fall into the Electro Physical Agents grouping. Mechanical vibration at increasing frequencies is known as sound energy. The normal human sound range is from 16 Hz to something approaching 15-20,000 Hz (in children and young adults). Beyond this upper limit, mechanical vibration is known as ultrasound. The frequencies used in therapy are typically between 1.0 and 3.0 MHz **[20].**

Therapeutic ultrasound has a frequency range of 0.75-3MHz, with most machines set at a frequency of 1 or 3MHz.Low-frequancy ultrasound waves have greater depth of penetration but are less focused. Ultrasound at a frequency of 1 MHz is absorbed primarily by tissues at a depth of 3-5cm and is recommended for deeper injuries and in patients with more subcutaneous fat. A frequency of 3MHz is recommended for more superficial lesions at depths of 1-2cm **[21].**

This study was conducted to compare between the efficacy of Low-level laser therapy and Therapeutic Ultrasound on Sacroiliac joints pain after delivery.

Subjects, Material and Methods

This study was carried out on Forty multiparous women suffering from Sacroiliac joints pain (for at least 3 months after delivery), they were selected randomly from the outpatient clinic of orthopedic at El Sadat General Hospital, Al-Monofia. They were randomized into two groups their ages were ranged from (20-30) years old; their body mass index didn't exceed 30kg/m^2, and their parity was (2-4) children [as shown in] (Table 1).

Table (1): Demographic features (general characteristics) of the two studied groups (A&B).

	Group A (n=20)	Group B (n=20)	*t*-value	*p*-value
Age (years)	33.05±2.48	33.82±1.88	–1.113	0.272 (NS)
Weight (kg)	82.82±4.90	82.48±5.19	0.219	0.828 (NS)
Height (cm)	168.25±3.88	168.20±3.89	0.041	0.968 (NS)
BMI (kg/m^2)	29.24±0.88	29.12±0.95	0.432	0.668 (NS)

Data are expressed as mean ± SD.
NS = p>0.05 = Not significant.

Material:

A- Informed Consent Form (Appendix I): Each patient in both groups (A&B) was asked to sign on the Consent Form before participating in this study.

B- Recording data sheet (Appendix II): All data of each patient in both groups (A&B) were recorded in a data sheet including: Name, age, address, occupation, weight, height, BMI, date of delivery, type of delivery, number of parities, chief complain, diagnosis, past & present history.

C- Visual Analogue Scale (VAS): It is a graphic rating scale with numerical values ranged from (0-4), placed equidistantly on a line of 10cm long drawn horizontally. The description and numbers help the patient to describe her level of pain.

(0) Represents no pain.
(1) Represents mild pain.
(2) Represents moderate pain.
(3) Represents severe pain.
(4) Represents intolerable pain.

D- Syringes: They were used to withdrawn blood samples from each patient in both groups (A&B) before and after treatment course in the early morning to measure cortisol level in blood plasma. About 3cm of blood was withdrawn from the antecubital vein in the early morning from each patient in groups (A&B) pre and after treatment and they were sent immediately to laboratory centre to analysis.

E- Weight-height scale: It was used to measure the BMI for each patient in both groups (A&B). BMI=Weight (kg)/Height (m^2) = kg/m^2. It is a valid, reliable, and standard weight and height scale.

F- Low Level laser therapy device: It was used to treat all patients in group (A).

G- Ultrasonic device: It was used to treat all patients in group (B).

H- Two Goggle glasses: It was used by the patient and physiotherapist during application of Laser therapy to protect their eyes from Laser beam during treatment by low level laser therapy.

I- Sacro iliac belt: It was used by each patient in both groups (A&B) to rest the tendons throughout the treatment Course (4 weeks).

J- Stopwatch: It was used to determine time of each treatment session.

K- Plinth, disposable sheets, towels, 2 chairs, a bottle of alcohol and cotton.

L- Mirror: It was used to help in posture exercises.

Evaluative procedures:

1- All data of each patient in both groups (A&B) were recorded in the recording data sheet before starting the treatment course.

2- Weight and height of each patient in both groups (A&B) was measured and BMI was calculated before starting the treatment course.

3- Each patient was asked to sit on armchair. The antecubital area was cleaned with alcohol. A blood sample of 3cm was withdrawn from the antecubital vein from each patient in both groups (A &B) by disposable sterile syringe. All the samples were collected in the morning before breakfast for all patients in both groups (A&B) before and after treatment course and were sent immediately to the laboratory centre for analysis.

4- Each patient was asked to put a mark on visual analogue scale (VAS) before and after the treatment course to estimate intensity of her pain.

Treatment procedure:

Group (A):

This group was consisted of 20 patients. Each patient in this group was received low level laser therapy on her Sacro-iliac joints for 180 seconds (90 seconds on each sacroiliac joint) 3 times / week for 12 weeks. Also, she was asked to perform core strengthening exercises (for her abdominal, back, pelvic floor muscles and diaphragm) for 60 minutes, 3 times / week for 12 weeks. At the same time, each patient was advised to wear a Sacro-iliac belt all day and take it off only during sleep and taking a shower throughout the treatment course as the Following: Each patient in this group was asked to lie in prone lying position, then she was covered with a white sheet except the treated area. The tender Point on each Sacro-iliac joint was detected and remarkable, then the skin over this area was cleaned with a piece of cotton immersed in alcohol to decrease the skin resistance. The physiotherapist was adjusted the low-level laser therapy device on the Followings parameters: Wavelength: 830nm. Energy density: $20J/cm^2$. Power: 30-40mw. Continuous output of 100. Beam diameter: 4mm. Irradiation rate (time of treatment session): 90 seconds on each tender point of sacroiliac joint. After adjusting the low-level laser therapy device, the physiotherapist worn goggle glasses to protect his eyes from the laser beam during treatment session. After that, the laser probe hold perpendicular to the tender point of the Sacro-iliac joint (where the distance between the probe and the skin will be 2.5cm). Then, the low-level laser therapy device was switched on to deliver the low-level laser beam, for 90 seconds on each Sacro-iliac joint. After Finishing the session, the low-level laser device was switched off, and the patient was asked to perform core strengthen exercises for 60 minutes. At the end, the Patient was asked to wear the sacroiliac belt. This procedure was repeated 3 times/ week for 12 weeks.

Group (B):

This group was consisted of 20 Patients. Each patient in this group was received therapeutic ultrasound on her Sacro-iliac joint for 10 minutes (5 minutes in each sacroiliac joint), 3 times / week for 12 weeks so, she was asked to perform core strengthening exercises as group (A) for 60 minutes, 3 times/ week for 12 weeks as the following: Each patient in this group was asked to lie in prone lying position, then she was covered with a white sheet except the treated area. The tender point on each Sacro-iliac joint was detected and remarkable, then the skin over this area was cleaned with a piece of cotton immersed in alcohol to decrease the skin resistance. Then the physiotherapist covered the transcutaneous head of ultrasonic device with a condom to avoid transferring of infection and adjust ultrasonic device on the following parameter: Frequency: 1 MHz. Intensity: $0.5\text{-}1w/cm^2$. Mode: Continuous mode. Duration: 10 minutes (5 minutes on each sacroiliac joint). After adjusting the ultrasound device, a sufficient amount of Sono gel was placed on the skin of the treated Sacro-iliac joint, then the therapist was hold the transducer head (treatment head of ultrasound device) from its handle and switch on

the ultrasonic device. After that, the physiotherapist was started to move the transducer head in a circular movement continuously on each Sacro-iliac joint. After finishing the session, the ultrasonic device was switched off and the treated area was cleaned with a piece of cotton. Later, the patient was asked to perform core strengthen exercises as in group (A) for 60 minutes. At the end, the Patient was asked to wear the sacroiliac belt. This procedure was repeated 3 times/week for 12 weeks.

Results

By comparing the two groups (A & B) after treatment regarding to VAS scores, it was found that, both groups showed a decrease in pain sensation after treatment, group (A) achieved 81.01% while group (B) achieved 29.45% but the percentage of decrease in VAS was more pronounced and more notable in group (A) when compared with group (B), this means that laser therapy was more effective than ultrasound therapy in decreasing SIJ pain.

Table (2) and Figs. (1-3): Illustrates mean ± SD for VAS scores before and after treatment for both groups (A & B).

Variable	Group A		Group B	
	Before treatment	After treatment	Before treatment	After treatment
Mean ± SD	3.95±0.22	0.75±0.91	3.90±0.31	2.75±1.16
MD	3.20		1.15	
t# value	16.000		4.524	
p-value	0.001		0.001	
% of in VAS	81.01%		29.49%	
Significance	Highly significant		Highly significant	

MD = Mean difference.

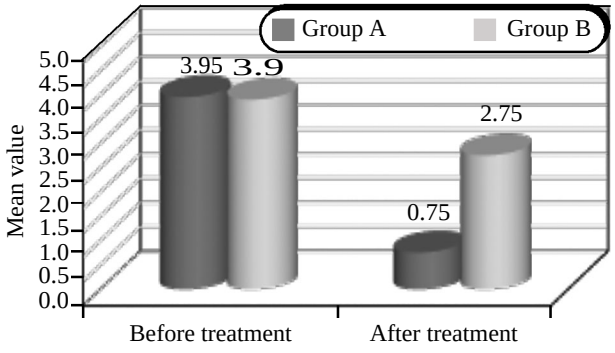

Fig. (1): Illustrates mean values of VAS measured before and after treatment in the two studied groups (A & B).

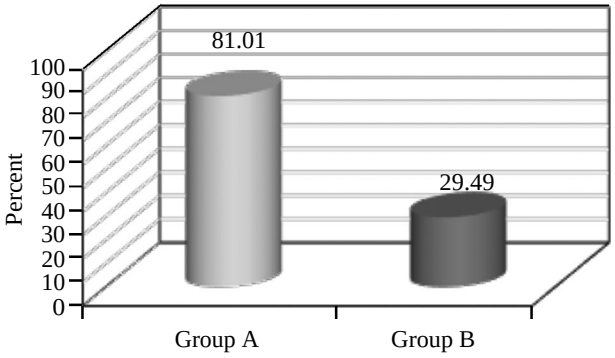

Fig. (2): Illustrates percent of decrease in VAS scores in both groups (A & B) after treatment.

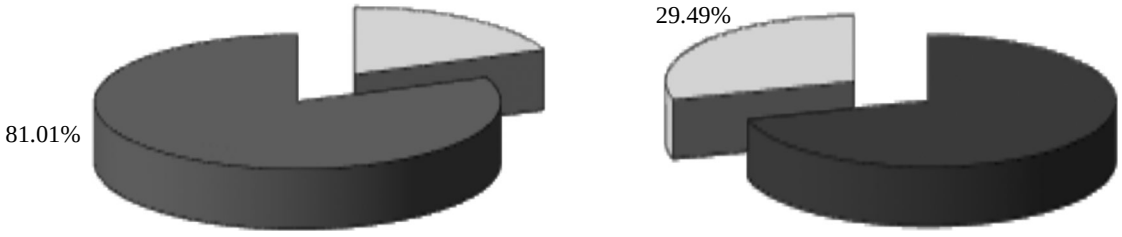

Fig. (3): Illustrates percent of decrease in VAS scores after treatment in both groups (A & B).

By comparing the two groups (A & B) after treatment regarding to serum cortisol level, it was found that, both groups showed a decrease in serum cortisol level after treatment, group (A) achieved 64.45% while group (B) achieved 28.88% but the percentage of decrease in serum cortisol level was more pronounced and more notable in group (A) when compared with group (B), this means that laser therapy was more effective than ultrasound therapy in decreasing serum cortisol level.

Table (3) and Figs. (4-6) illustrates mean ± SD for serum cortisol before and after treatment for both groups (A & B).

Variable	Group A		Group B	
	Before treatment	After treatment	Before treatment	After treatment
Mean ± SD	19.97±1.84	7.10±2.35	20.67±1.59	14.70±4.91
MD	12.87		5.97	
t# value	23.396		5.812	
p-value	0.001		0.001	
% of in cortisol	64.45%		28.88%	
Significance	Highly significant		Highly significant	

MD = Mean difference.

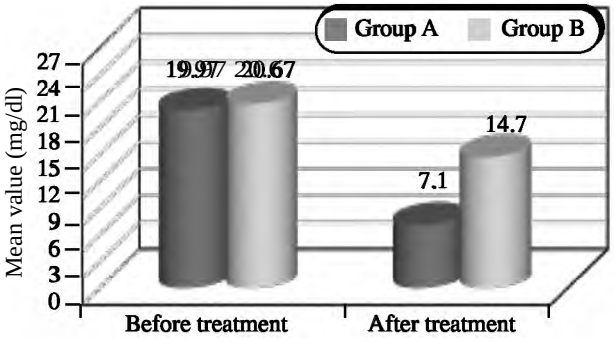

Fig. (4): Illustrates mean values of serum cortisol measured before and after treatment in the two studied groups (A&B).

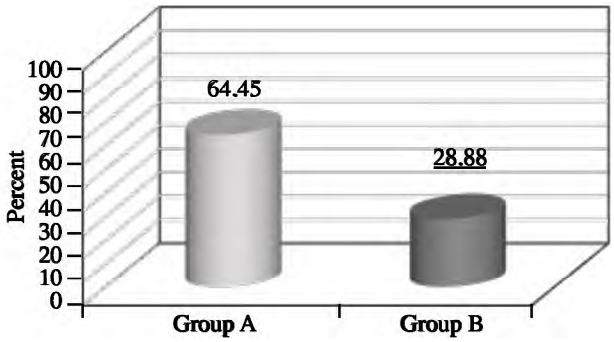

Fig. (5): Illustrates percent of decrease in serum cortisol level in both groups (A & B) after treatment.

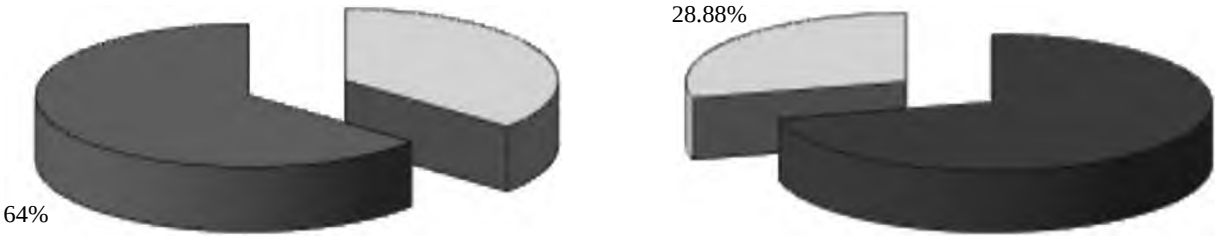

Fig. (6): Illustrates percent of decrease in serum cortisol after treatment in both groups (A & B).

Discussion

Alayat et al., [22] had conducted an experimental Study to Compare between effect of low-level laser therapy and therapeutic ultrasound on SIJs pain after delivery. The result of his study revealed that, LLLT achieved a highly Statistically Significant decrease in pain sensation and serum Cortisol level in blood Plasma greates than therapeutic ultrasound. This means that, low Level laser therapy was advanced to therapeutic ultrasound in alleviating pain, reducing inflammation, and decreasing blood cortisol level in blood plasma after treating SIJs pain. Alayat added that, "IF you are a physiotherapist, don't hesitate to choose low level laser therapy to treat SIJs pain. It is the best modality to relieve pain, reduce inflammation and improve muscle Function. The patients can return to their normal activities of daily Living with pain free after only a few sessions. This in turn affects greatly on their emotional and psychological status making them So happy with their newborns". This came in agreement with the results of the current study.

The results of the present study agree with the results of Falaki et al., [23] who reported that, "It is approved that, LLLT has anti-inflammatory effects, anti-oedematous effect, it closes pain gait and stimulates natural pain killer chemicals, such as endorphins and enkephalins. So due to less inflammation, there is less oedema and less pain".

The American Physical Therapy Association (APTA) in 2019 reported that "LLLT is basically

light energy that has amplified and focused into a particular area. LLLT or (cold laser) works by flooding the injured tissue with photons which stimulate healing in damaged cells and increase circulation to the area". The body's natural healing response relieves pain, improves function and reduces swelling without medication or surgery. Best of all, therapeutic effect of LLLT continues long after the treatment itself. For 18 to 24 hours the last is applied to the injured area, your body continuous to benefit from the metabolic effect of your treatment. This metabolic effect has a domino effect throughout the body reducing inflammation and lowering pain levels. It has been clinically proven to relieve pain in SIJs pain and other acute and chronic pain conditions Weiss et al., ***[24]***. This came in agreement with the results of the current study.

The results of the current study are confirmed with the results of McGowan et al., ***[25]*** who stated that, " Laser therapy uses a process called photo biomodulation. Photons enter the tissue and interact with the cytochrome c complex within mitochondria. This interaction triggers a biological cascade of events that leads to an increase in cellular metabolism and a decrease in both pain and inflammation". Unlike medications, laser therapy reduces pain without undesirable side effects. After laser therapy, patients with SIJs pain reports long-acting pain relief. Many patients experienced long lasting pain relieve after only a couple of treatments. LLLT is particularly effective when it is administration as soon as possible following injury. The faster the inflammation is reduced, and the healing process can begin. LLLT helps to restore normal function quickly. LLLT is the best modality to treat SIJs pain, it gives amazing results.

Armagan et al., ***[26]*** stated that "In SIJs pain it is best to administer LLLT treatment as soon as possible for faster recovery". The sooner the inflammation is reduced, the pain is relieved, the earlier the recovery process can begin. For those who have SIJs pain, laser therapy can help to address persistent pain and inflammation associated with them, so no need for medication or surgery, its results are very fast, more efficient and superior to therapeutic ultrasound in alleviating pain and other symptoms of Sacro-iliac joint pain".

Conclusion:

Low level laser therapy is more effective than therapeutic ultrasound to relieve SIJs pain after delivery.

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العلاج بالموجات فوق الصوتية مقابل الليزر منخفض المستوى على ألم المفصل العجزى الحرقفى بعد الولادة

يهدف هذا البحث الى مقارنه تأثير الليزر منخفض الشدة العلاجى بتأثير الموجات الصوتيه العلاجيه فى علاج إلتهابات وألالام المفصل العجزى الحرقفى فى السيدات ما بعد الولادة.

شملت هذه الدراسة أربعين امرأة مرضعة متعدده الاجنه يعانين من ألالام المفصل العجزى الحرقفى بعد الولادة (لمده ٣ شهور علي الأقل بعد الولاده). تراوحت أعمارهم بين (٢٥-٣٥)عاما . لم يتعدى مؤشر كتلة الجسم ٣٠ كغم / م ٢ وكان عدد انجابهم يتراوح بين (٢-٤) طفل وقد تم إختيار المرضى من العيادة الخارجية من مستشفى السادات المركزى وقد تم تقسيم المرضى عشوائياً إلى مجموعتين متساويتين:

المجموعة (أ): اشتملت هذه المجموعة على عشرين مريضة تلقين العلاج بالليزر منخفض الشدة لمدة مائه وثمانون ثانيه (تسعين ثانية لكل مفصل)، ٣ جلسات إسبوعياً لمدة ١٢ أسبوع مع استخدام حزام مثبت للمفصل العجزى الحرقفى يتم ارتدائه طوال كورس العلاج ويخلع فقط اثناء النوم او الاستحمام وتمرينات تقوية للعضلات المحورية على (عضلات البطن والظهر وعضلات قاع الحوض وعضلات التنفس والفخذ) وإمالة الحوض الخلفية وتمارين تصحيح القوام لمدة ٦٠ دقيقة ٣ مرات / أسبوع لمدة ١٢ أسبوع.

المجموعة (ب): اشتملت هذه المجموعة على عشرين مريضة تلقت هذه المجموعة العلاج بالموجات الفوق صوتيه العلاجيه لمده عشر دقائق (خمس دقائق لكل مفصل) أسبوع مع استخدام حزام مثبت للمفصل العجزى الحرقفى يتم ارتدائه طوال كورس العلاج ويخلع فقط اثناء النوم او الاستحمام وتمرينات تقوية للعضلات المحورية على (عضلات البطن والظهر وعضلات قاع الحوض وعضلات التنفس والفخذ) وإمالة الحوض الخلفية وتمارين تصحيح القوام لمدة ٦٠ دقيقة ٣ مرات / أسبوع لمدة ١٢ أسبوع.

طرق التقييم: ا- إختبار مقياس النظير البصرى. ب- قياس مستوى الكروتيزول فى الدم.

نتائج البحث: وقد أظهرت نتائج البحث وجود فارق ذو دلاله إحصائية فى كل من المجموعتين بعد العلاج. وبمقارنة نتائج المجموعتين وجد التالى:

١- وجود نقص ذو دلالة احصائية فى المؤشر البصرى للألم لصالح المجموعة (أ).

٢- وجود نقص ذو دلالة احصائية فى مستوى الكورتيزول فى الدم لصالح المجموعة (أ).

الاستنتاج: نستنتج من هذه الدراسه أن تأثير الليزر منخفض الشده مزودة بحزام مثبت للمفصل العجزى الحرقفى وتمرينات تقوية للعضلات المحورية على الم المفصل العجزى الحرقفى بعد الولادة أكثر فعالية من تأثير الموجات الصوتيه مزوده بحزام مثبت للمفصل العجزى الحرقفى وتمارين تقوية العضلات المحورية فى تقليل شدة الألم الحالية وخفض مستوى الكورتيزون فى الدم.