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Efficacy of Laser Acupuncture on Carpal Tunnel Syndrome after Delivery

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Abstract

Background: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, which results from median nerve compression at the wrist, leading to pain, paresthesia and muscle weakness in the hand and forearm. Laser acupuncture (LA), a non-invasive therapy which uses Laser light to stimulate specific acupuncture points, is greatly helpful to relief pain of CTS.

Aim of Study: This study was conducted to investigate the effect oflaser acupuncture on carpal tunnel syndrome after delivery.

Patients and Methods: This study was carried out on Forty multiparous women suffering from Carpal Tunnel Syndrome after delivery, They were selected randomly from the outpatient Orthopedic Clinic at Zagazig University Hospitals. Their ages were ranged from (25-35) years old, their body mass index didn't exceed 30kg/m^2, and Their Parity will be ranged from (2-4) children. All patients were divided randomly into 2 groups equal in number, study group (A) & Control group (B). Study group (A) This group was consisted of 20 patients. Each patient in this group had received LLLT on the acupoints PC6 (Neiguan) and PC7 (Daling) for dominant hand for 90 seconds, 3 times/ week for 8 weeks. Also each patient was asked to perform an exercise program in her dominant hand for 30 minutes, 3 times/ week for 8 weeks. Also, each patient was asked to wear cock up splint throughout the treatment course which was adjusted at neutral angle all day and take it off during exercising and taking a shower throughout the treatment course (8 weeks). Control group (B) was consists of 20 patients, each patient in this group had received sham laser on the acupoints PC6 (Neiguan) and PC7 (Daling) for dominant hand for 90 seconds, 3 times/week for 8 weeks. Also each patient was asked to perform an exercise program in her dominant hand for 30 minutes, 3 times/ week for 8 weeks. Also, each patient was asked to wear cock up splint throughout the treatment course which was adjusted at neutral angle at all day and take it off during exercising and taking a shower throughout the treatment course (8 weeks). All patients in both groups (A&B) were evaluated by Visual Analogue Scale (VAS) and measuring serum cortisol level in blood plasma before starting and after the end of treatment program.

Results: Both groups showed a statistically significant decrease in both visual analogue scale and serum cortisol level after treatment, Group (A) achieved percentage of decrease in visual analogue scale by 83.78% and achieved percentage of decrease in serum cortisol level by 61.66% while group (B) achieved percentage of decrease in visual analogue scale by 25.0% and achieved percentage of decrease in serum cortisol level by 16.61%. 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 notable when compared with group (B).

Conclusion: It was concluded that laser acupuncture is very effective in relieving pain of Carpal tunnel Syndrome after delivery.

Key Words: *Carpal Tunnel Syndrome – Low level laser therapy – Laser acupuncture – Visual analogue scale (VAS) – Cortisol level in the blood plasma.*

Introduction

Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, which results from median nerve compression *[1]*.

Carpal tunnel syndrome or median nerve neuropathy at the wrist is a medical condition in which the median nerve is compressed at the wrist, leading to pain, paresthesia and muscle weakness in the hand and forearm *[2]*.

Prevalence of CTS in the general population is 3.8% when diagnosed clinically and 2.7% when diagnosed neurophysiologically. Women are more susceptible to CTS, with a 70% incidence rate, especially middle aged women. CTS is a common complaint during pregnancy, as the existing data show the prevalence rate of CTS during pregnancy to be as high as 62% *[3]*.

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It is usually diagnosed in the third trimester of pregnancy and it is often bilateral. In majority of the patients symptoms will resolve either spontaneously or will respond to conservative treatment after delivery *[4]*.

Compression of the median nerve as it runs deep to the transverse carpal ligament (TCL) causes atrophy of thenar eminence, weakness of the flexor pollicis brevis, opponens pollicis brevies, as well as sensory loss in the distribution of the median nerve distal to transverse carpal ligament *[5]*.

Pain and paresthesia in the thumb, first two fingers, and the radial half of the ring finger are the most common clinical features of CTS. Paresthesia and sensory deficits might involve the entire palm area in some cases *[6]*. Compression of the median nerve at the carpal tunnel may cause ischemia. Ischemia also plays a pathogenic role in the carpal tunnel syndrome. Patients often awaken at night shake out their hands to get pain relief. This phenomenon is called flick sign, which is 96% specific and 93% sensitive for CTS *[7]*.

Diabetes, Rheumatoid arthritis, hypothyroidism, pregnancy and menopause are known to cause CTS. Although most pregnant women experience symptom relief following delivery, a significant percentage continue to have some level of complaint up to three years after giving birth. It is very common in lactating women due to holding the infant and the hormonal changes *[8]*.

There are several therapeutic options for patients with CTS depending on various factors, including the stage of the disease, the severity of the symptoms, and patient's preferences. Non-surgical intervention is recommended as the first-line treatment, in cases of mild to moderate CTS. They are indicated in patients with no muscle weakness, atrophy, or denervation and with only a mild abnormality on nerve conduction studies *[9]*.

In physical therapy field, there are several physical therapy modalities can be used to treat CTS such as: Cold or ice application, therapeutic ultrasound, low level laser therapy, TENS, neuromuscular electrical nerve stimulation, shockwave therapy, pulsed electromagnetic field, shortwave diathermy, acupuncture, and kinesiotaping *[10]*.

LLL is a non-invasive light source treatment that uses red and near-infrared monochromatic light to treat soft tissues injuries without increasing skin temperature. It has low energy output (between 1 and 1000mw) and generates a single wavelength of light (between 600 and 1100nm). Lasers have been used for photo biomodulation; Low Level Laser is effective in the management of CTS *[11]*.

Low level Laser therapy (LLLT) has been used as a non-pharmacological alternative agent to treat painful musculoskeletal conditions for 3 decades. The laboratory researches have been showed that low energy irradiation from lasers alters cellular process, producing among others anti-inflammatory effects, increased collagen turnover andacceleratednerve regeneration. Also, laser therapy has been approved to be a useful modality in the treatment of carpal tunnel syndrome *[12]*.

It has been reported that LLLT therapy had anti-inflammatory and anti-oedematous actions due to its reduction effect in prostaglandin synthesis. Its inhibition effect on prostacyclin has especially been reported to provide pain and inflammation regression *[13]*.

In another study, the authors had suggested that an inhibition of neuronal activity might be responsible for the therapeutic effect, and the laser irradiation selectively inhibited nociceptive signals at peripheral nerves *[14]*.

Among several interventions for pain management, acupuncture has received special attention asacupuncture can improve the overall subjective symptoms of carpal tunnel syndrome which successfully alleviates pain, inflammation, numbness, and restores motor dexterity. Acupuncture is the most familiar complementary and alternative medicine,the Acupuncture and carpal tunnel syndrome efficacy of acupuncture in management of mild to moderate CTS has been investigated in many studies *[15]*.

Acupunctureis a form of alternative medicine and a component of traditional Chinese medicine in which thin needles are inserted into the body. The overall concept behind acupuncture is that the body runs on energy, or qi (pronounced "chee"). The energy system involves defined pathways known as meridians, each of which has multiple acupuncture points that affect various organs, areas or body systems. The foundational concept of how acupuncture is done is through stimulating the acupuncture points to correct imbalances or blockages in the flow of energy and ultimately to restore health. Multiple studies have shown the effectiveness in the treatment of back pain, either acute or chronic, knee pain secondary to osteoarthritis, myofascial pain, depression, anxiety, headache, allergies, general pain, female infertility, insomnia, neck pain and frozen shoulder. Most practitioners recommend not undergoing acupuncture if experiencing active infection, especially cutaneous, malignancy, as there might be a threat of the spread of neoplastic cells; and severe neutropenia secondary to the risk of infection *[16]*.

Lately, many clinicians have used LLLT on acupuncture on point, which is called laser acupuncture (LA), to treat many clinical problems, such as musculoskeletal pain, lateral epicondylitis, headaches, CTS, etc. In contrast with traditional acupuncture

needles, LA is a non-invasive therapy that does not cause tingling or pain during procedures *[17]*.

A laser beam of energy enters the acupuncture point and begins a cascade of beneficial biological effects: Accelerate tissue repair and cell growth, anti-Inflammatory, immunoregulation, analgesic, improve nerve function, improve vascular activity, increased metabolic activity, and trigger point resolution and acupuncture point stimulation *[18]*.

Material and Methods

This study had lasted 12 months from June 2023 to June 2024.

This study was carried out on forty women suffering from carpal tunnel syndrome in their dominant hands after delivery. They were selected randomly from the outpatient Orthopedic clinic of Zagazig University Hospitals. Their ages ranged from 25 to 35 years old, their body mass index were exceed 30kg/m^2 and their parity ranged from 2 to 4 children.

Table (1): It illustrate Demographic characteristics of all patients in both groups (A&B).

	Group A (n=20)	Group B (n=20)	*t*-value	*p*-value
Age (years)	28.30±2.25	29.02±2.35	–0.996	0.326 (NS)
Weight (kg)	80.72±6.34	78.90±6.51	0.898	0.375 (NS)
Height (cm)	167.45±4.72	165.70±4.87	1.154	0.256 (NS)
BMI (kg/m^2)	28.76±1.12	28.68±1.16	0.222	0.825 (NS)

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

Material:

A- Informed consent Form: Each patient in both groups (A&B) was asked to Sign on the Consent Form before Starting the treatment Course.

B- Recording data sheet: It was used to record all data of each patient in both groups (A&B) in it before starting the treatment Course. It included name, age, address, occupation, diagnosis, chief complaint, past & present history, obstetric history and family history.

C- Weight-Height scale: It was used to measure weight and height of each Patient in both groups (A&B) before starting the treatment Course to calculate body mass index through this equation: BMI = body weight (Kg)/square of body heights $(m)^2$.

D- 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.

E- 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.

F- Low Level laser therapy device: It was used to treat the patients.

G- Two Goggle glasses: They were used by the patient and physiotherapist during application of low level Laser therapy to protect their eyes from Laser beam during application of low level laser therapy.

H- Cock up wrist splint: It was used by each patient in both groups (A&B) to rest the wrist in neutral position throughout the treatment Course (8 weeks).

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

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

K- Pen marker: It was used to put marks for points which were treated.

L- Cane, a rubber ball, an elastic band, and small weight dumbbells: These things were used by each patient in both groups (A&B) during exercise Program.

Evaluating procedures:

It was done through:

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) were 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 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:

Study group (A):

Each patient in this group was asked to sit on arm chair and rest her dominant hand on the treatment table in the supination position while the wrist joint was supported on a towel and the acupoints were detected and remarkable. The skin of the painful area was cleaned with a piece of cotton immersed in alcohol. The physiotherapist was also sitting on another arm chair in front of the patient to apply the treatment session for her. Then, the low level laser device was adjusted on the following parameters: Wave length: 830nm, Energy density: $20J/cm^2$, Power: 30-40mw, Continuous output of 100%, Beam diameter: 4mm, Irradiation rate (time of treatment session): 90 seconds for the acupoints. Protective goggles had been worn by the patient and the physiotherapist to protect their eyes from the laser beam. After that the laser probe was held perpendicular to the area to be treated (the distance between the probe and the skin will be $2.5cm^3$), Then the laser device switched on to deliver the low level laser beam on the acupoints [Pericardium (PC) meridians PC6 and PC7 on the medial aspect of the arm] for 90 seconds After finishing the session the LLLT device was switched off, and the patient started to perform the exercise program for her dominant hand and wrist for 30 minutes, then she was asked to wear the cock up splint. This session repeated 3 times per week for 8 weeks.

Control group (Group B):

Each patient in this group was asked to sit on arm chair and rest her dominant hand on the treatment table in the supination position while the wrist joint was supported on a towel and the acupoints were detected and remarkable. Theskin oft-he painful area wascleaned with a piece of cotton immersed in alcohol. The physiotherapist was also sitting on another arm chair in front of the patient to apply the treatment session for her. Then, the low level laser device will be applied without any laser power output. There will be no differences in observation, feeling, or listening between the two groups during the procedure. Hence, all patients in both groups will be blinded to group selection. Time of treatment session: 90 seconds for the acupoints, Protective goggles had been worn by the patient and the physiotherapist. After that the laser probe was held perpendicular to the area to be treated (the distance between the probe and the skin will be 2.5 cm^3) on the acupoints [Pericardium (PC) meridians PC6 and PC7 on the medial aspect of the arm]. After finishing the session the LLLT device was switched off, and the patient started to perform the exercise program for her dominant hand and wrist for 30 minutes, then she was asked to wear the cock up splint. This session repeated 3 times per week for 8 weeks.

The exercise program including:

1- Stretching exercises:

Wrist extension stretch:

The patient is asked to straighten his arm and bend his wrist back as if signaling someone to “stop.”, use the opposite hand to apply gentle pressure across the palm and pull it toward him until he feels a stretch on the inside of his forearm, hold the stretch for 15 seconds, repeat 5 times, then perform this stretch on the other arm and do not lock the elbow.

Wrist flexion stretch:

The patient is asked to straighten his arm with his palm facing down and bend the wrist so that his fingers point down, gently pull his hand toward his body until he feels a stretch on the outside of his forearm, hold the stretch for 15 seconds, repeat 5 times, then perform this stretch on the other arm and do not lock the elbow.

2- Strengthening exercises:

Wrist flexion & extension strengthening exercises: The patient was asked to keep her forearm in supination and hold a small weight in her hand then make flexion in her wrist joint, hold then relax. After that, the patient was asked to turn her forearm in pronation and hold the same weight then make extension in her wrist joint, hold then relax. This exercise was repeated several times.

Wrist radial & ulnar deviation strengthening exercises: The patient was asked to rest her forearm on the treatment table in midline position while her wrist joint was rested on the edge of the table and hold a small weight in her dominant hand. The physiotherapist was sitting at the edge of the table supporting the patient’s wrist joint and asked her to make ulnar and redial deviation in her wrist joint then relax. This exercise was repeated several times.

Hand grip strengthening exercise: The patient was asked to rest her elbow joint on the treatment table and hold a small rubber ball in her dominant hand. Then, she was asked to squeeze the ball firmly and relax. This exercise was repeated several times.

Finger spring strengthening exercise: The patient was sitting, resting her elbow joint on the treatment table and place an elastic band around her thumb & fingers. The elastic band was tight enough to offer some resistance. Then, the patient was asked to open her thumb and four fingers to stretch the elastic band as far as she can then relax. This exercise was repeated several times.

3- Nerve and Tendon Glides:

Tendon glides:

The patient is asked tostraight fully straighten all of hisfingers, then bend the tips of the fingers into the “hook” position withthe knuckles pointing

up, then make a tight fist with the thumb over his fingers, With his hand in front of him and the wrist straight fully straighten all of the fingers again, make a "tabletop" with the fingers by bending at the bottom knuckle and keeping the fingers straight. Finally bend the fingers at the middle joint, touching his fingers to the palm.

Medial nerve glides:

The patient is asked tomake a fist with the thumb outside his fingers, extend the fingers while keeping the thumb close to the side of the hand, keep the fingers straight and extend the wrist, Keep the fingers and wrist in position and extend the thumb, Keep the fingers, wrist, and thumb extended and turn the forearm palm up, keep the fingers, wrist, and thumb extended and use the other hand to gently stretch the thumb.

Results

By comparing the two groups (A & B) after treatment regarding o VAS scores, it was found that, both groups showed a decrease in pain score after treatment, group (A) achieved 83.78% while group (B) achieved 25.0% but the percentage of decrease in VAS was more pronounced and more notable in group (A) when compared with group (B), this means that low level laser therapy acupuncture was greatly effective in decreasing pain.

Table (2) and Figs. (1&2&3) illustrate 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	3.70±0.47	0.60±0.88	3.60±0.50	2.70±0.92
MD	3.10		0.90	
t# value	15.203		4.723	
p-value	0.001		0.001	
% of in VAS	83.78		25.0	
Significance	Highly significant		Highly significant	

MD = Mean difference.

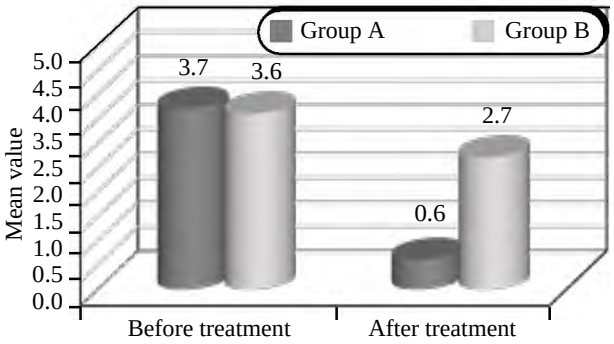

Fig. (1): Illustrates mean values of VAS measured before and after treatment in the two studied groups (A & B).

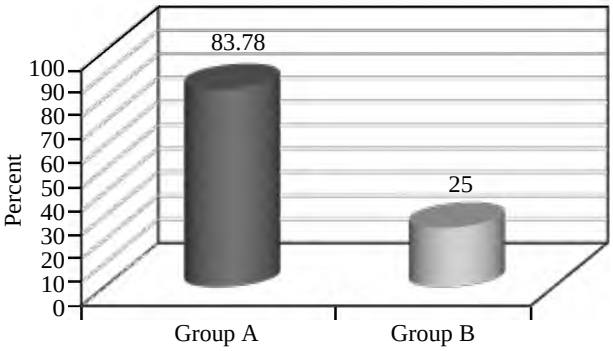

Fig. (2): Illustrates percent of decrease in VAS scores in both groups (A & B) after treatment.

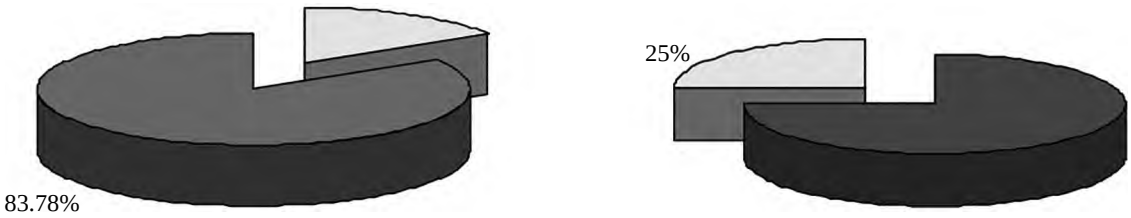

Fig. (3): Illustrates percent of decrease in VAS scores after treatment in both groups (A & B).

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	20.24±2.29	7.76±1.51	19.93±2.59	16.62±3.72
MD	12.48		3.31	
t# value	23.828		5.720	
p-value	0.001		0.001	
% of in cortisol	61.66		16.61	
Significance	Highly significant		Highly significant	

MD = Mean difference.

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 61.66% while group (B) achieved 16.61% but the percentage of decrease in serum cortisol level was more pronounced and more not able in group (A) when compared with group (B), this means thatlow level laser acupuncture therapy was highly effective in decreasing serum cortisol level.

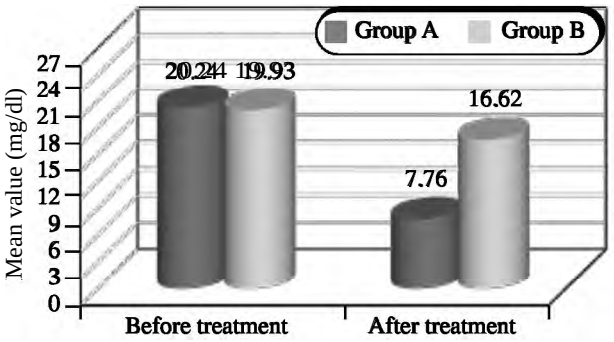

Fig. (4): Illustrates mean values of serum cortisol measured before and after treatment in the two studied groups (A&B).

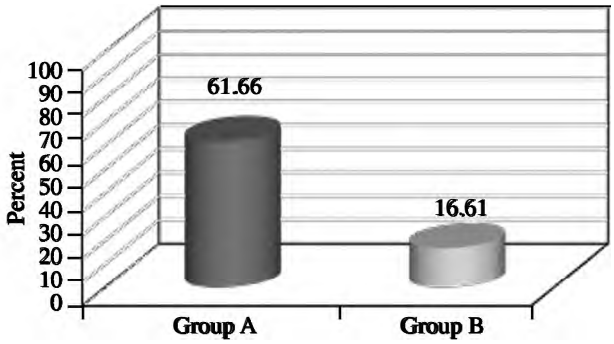

Fig. (5): Illustrates percent of decrease in serum cortisol level in both groups (A & B) after treatment.

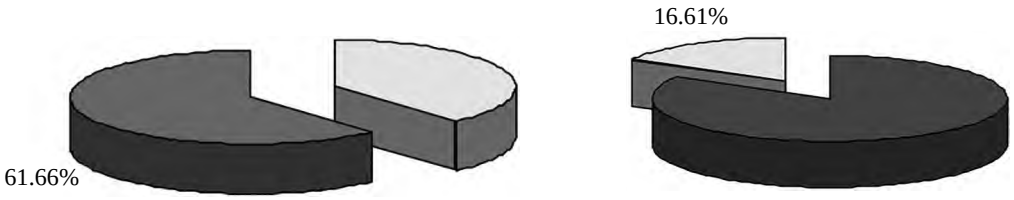

Fig. (6): Illustrates percent of decrease in serum cortisol after treatment in both groups (A & B).

Discussion

Several studies have investigated the effects of physical therapy interventions on Carpal Tunnel Syndrome. For example, O'Connor et al., *[19]* reported that, Low Level Laser therapy is a marvelous intervention to relieve pain in so many musculoskeletal pathological conditions. It has a beneficial effect in treating Carpal Tunnel Syndrome, acute & chronic back pain, sciatic pain, neck & shoulder pain, Coccydynia, Sacro-iliac joint pain, Pelvic girdle pain, primary dysmenorrhea, De quervain's tenosynovitis, Fibromyalgia, Osteoarthritis, Tennis elbow, Bursitis, Capsulitis, Tenosynovitis and plantar fasciitis. Moreover, all results of the experimental studies are amazing.

Falak et al., *[20]* reported that "It has been approved that, Low level laser therapy has anti-inflammatory and anti-oedematous effects. Itcloses pain gait and stimulates the release of natural pain killer chemicalssuch as endorphins and enkephalins. So, due to less inflammation, there isless oedema and less pain. This supports the result of current study.

Several studies have been used low level laser therapy as a non- pharmacological alternative agent to treat painful musculoskeletal conditions. The laboratory researches love been showed that, low energy irradiation from laser therapy alters cellular activities and produces anti- inflammatory effects as well as increases collagen turnover in the injured tissues. It has been approved that, laser therapy has a great capability to decrease pain sensation and achieves a noticeable improvement in hand function *[11]*. This agrees with the results of the present study.

Nesioonpour et al., *[21]* added that "low level laser therapy is a viable option that can help the patient. LLLT penetrates the skin layers & soft tissue structures and activates specific biochemical reactions as well as increases the all cellular metabolism. The light waves (photons) can penetrate the affected areas that are treated as far as two to three inches. Once the photons reach the injured tissues, they stimulate and energize the cells to repair the damage at a remarkable rate, this helps to reduce pain and inflammation and accelerate healing process. This treatment is fast and more efficient. It enables the patient to have pain free faster than any other modality. LLLT doesn't hurt, it is safe, non-invasive and has no side effects like medications. The treatment option takes only few minutes to give better results and remarkable decrease in pain sensation. For these reasons, low level laser therapy can be potentially effective in treating Carpal Tunnel Syndrome. This supports the result of current study.

Lopes et al., *[12]* stated that " LLLT generates simultaneous anti- reduces inflammatory and analgesic effects. It reduced inflammation, swelling, and pain. The anti-inflammatory effects of low level laser therapy work at the cellular level. Laser therapy does not suppress inflammation but, its timulates the body's cells to reduce inflammation, swelling and pain.

Juan et al., *[22]* Stated that"Laser Acupuncture is a noninvasive technique involving the stimulation of traditional acupoints, with low-intensity, non-thermal laser irradiation. The clinical application of LA is widespread. LLLT has biologic effects, such as increased pain tolerance, due to changes in the potency of the cellular membrane; vasodilatation; reduction of edema; increase in intracellular metabolism; and acceleration of wound healing. The biomodulatory effect of LLLT improves local microcirculation and oxygen supply to hypoxic cells in the painful areas. Simultaneously, tissue asphyxia is reduced to a minimum and collected waste products are removed. The laser-induced normalization of microcirculation interrupts the vicious cycle that originates, develops, and maintains pain; in addition, it restores the normal physiological condition of the tissue". This agrees with the results of the current study.

Ferreira et al., *[23]* Reported that "Laser acupuncture is a modality resulting from scientific exploration of TCM (traditional Chinese medicine). Acupuncture has both local and distant analgesic effects that may be mediated by different mechanisms. Various central opioid receptors are important in mediating the analgesic effect induced by acupuncture-related techniques of different frequencies. LA is not associated with somatosensation and has the advantage of being noninvasive and aseptic. Moreover, LA is painless and safe because no heat is generated during the procedure. It is also more effective and requires less time than needle-based acupuncture. This agrees with the results of the current study.

Conclusion:

Laser Acupuncture Therapy is greatly effective in treating Carpal Tunnel Syndrome after delivery.

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فعاليه الوخز بالليزر على متلازمة النفق الرسغى بعد الولادة

تهدف هذة الدراسة إلى معرفة تأثير الوخز بالليزر على آلام واختلال الأداء الوظيفى للرسغ وذلك بعد الولاده.

أجريت هذة الدراسة على اربعين امرأه يعانين من متلازمة النفق الرسغى بعد الولادة تراوحت اعمارهم ما بين ٢٥ إلى ٣٥ عاماً، لم يتعدى مؤشر كتلة الجسم عن ٣٠ كجم/م، وتراوحت عدد الولادات من ٢ إلى ٤ اطفال وتم توزيعهم عشوائياً إلى مجموعتين متساويتين :

المجموعة (أ): اشتملت هذة المجموعة على عشرين مريضة تلقت هذه المجموعة العلاج بالليزر منخفض الشده العلاجى لمده٩٠ ثانيه ٣ جلسات إسبوعيا لمدة ٨ أسابيع مع استخدام جبيره المعصم وبالاضافه إلى عمل تمارين علاجيه لمدة ٣٠ دقيقة ٣مرات / أسبوعيا لمدة ٨ أسابيع.

المجموعة (ب): اشتملت هذة المجموعة على عشرين مريضة استخدم تجبيره المعصم لمده ٨ أسابيع وبالاضافه إلى عمل تمارين علاجيه لمده ٣٠ دقيقة ٣ مرات/أسبوعياً لمدة ٨ أسابيع.

طرق التقييم :

– اختبار مقياس النظر البصرى – قياس مستوى الكورتيزون فى بلازما الدم.

نتائج البحث:

وقد اظهرت نتائج البحث وجود فارق ذو دلالة احصائية فى كل من المجموعتين بعد العلاج وبمقارنة نتائج المجموعتين وجد التالى :

– وجود نقص ذو دلالة احصائية فى المؤشر البصرى للالم لصالح المجموعة (أ).

– وجود زيادة ذو دلالة احصائية فى مستوى الكورتيزون فى الدم لصالح المجموعة (ا).

الاستنتاج: نستخلص من نتائج البحث ان الوخز بالليزر له فاعليه عاليه فى تحسين الأداء الوظيفى والألم للسيدات التى تعانى من متلازمه النفق الرسغى بعد الولاده.