



Low level laser therapy in pain controlling studies

Management of myofascial pain: low-level laser therapy versus occlusal splints. [Öz S](#), [Gökçen-Röhlig B](#), [Saruhanoglu A](#), [Tuncer EB](#), [J Craniofac Surg](#). 2010

Nov;21(6):1722-8.

Department of Maxillofacial Prosthodontics, University of Istanbul Faculty of Dentistry, Istanbul, Turkey.

Abstract

The present study was designed to compare the effects of low-level laser with occlusal splints in patients with signs and symptoms of myofascial pain (MP) dysfunction syndrome. A total of 40 (34 women and 6 men, with a mean age of 32.84 [SD, 10.70] years) were selected after the diagnosis of MP according to the Research Diagnostic Criteria for Temporomandibular Disorder. The patients were randomly divided into 2 groups: study group (n = 20) and control group (n = 20). Low-level laser was applied to patients in the study group 2 times per week, for a total of 10 sessions. Patients in the control group were instructed to wear occlusal splints 24 h/d for 3 months. The functional examination was based on Research Diagnostic Criteria for Temporomandibular Disorder and pressure pain threshold values were obtained with the aid of an algometer in both groups. Patients' self-report of pain was evaluated with visual analog scale. Comparisons were made within and between the groups before and after treatment. Vertical movements showed statistically significant improvements after the treatments in both groups ($P < 0.01$), but when the groups were compared with each other, there were no significant difference between the groups. In both groups, tenderness to palpation of the muscles decreased significantly. Pressure pain threshold evaluations and visual analog scale scores revealed similar results, too. This particular type of low-level laser therapy (820 nm, 3 J/cm², 300-mW output power) is as effective as occlusal splint in pain release and mandibular movement improvement in MP.

PMID: 21119408 [PubMed - indexed for MEDLINE]

Laser acupuncture in children with headache: a double-blind, randomized, bicenter, placebo-controlled trial.

[Gottschling S](#), [Meyer S](#), [Gribova I](#), [Distler L](#), [Berrang J](#), [Gortner L](#), [Graf N](#), [Shamdeen MG](#). *Pain*. 2008 Jul

15;137(2):405-12. Epub 2007 Nov 19. Department of Pediatric Hematology and Oncology, University Children's

Hospital, Saarland University, Kirrbergerstr, 66421 Homburg, Germany. kisgot@uniklinikum-saarland.de

Abstract

To investigate whether laser acupuncture is efficacious in children with headache and if active laser treatment is superior to placebo laser treatment in a prospective,



randomized, double-blind, placebo-controlled trial of low level laser acupuncture in 43 children (mean age (SD) 12.3 (+/-2.6) years) with headache (either migraine (22 patients) or tension type headache (21 patients)). Patients were randomized to receive a course of 4 treatments over 4 weeks with either active or placebo laser. The treatment was highly individualised based on criteria of Traditional Chinese medicine (TCM). The primary outcome measure was a difference in numbers of headache days between baseline and the 4 months after randomization. Secondary outcome measures included a change in headache severity using a 10 cm Visual Analogue Scale (VAS) for pain and a change in monthly hours with headache. Measurements were taken during 4 weeks before randomization (baseline), at weeks 1-4, 5-8, 9-12 and 13-16 from baseline. The mean number of headaches per month decreased significantly by 6.4 days in the treated group ($p < 0.001$) and by 1.0 days in the placebo group ($p = 0.22$). Secondary outcome measures headache severity and monthly hours with headache decreased as well significantly at all time points compared to baseline ($p < 0.001$) and were as well significantly lower than those of the placebo group at all time points ($p < 0.001$). We conclude that laser acupuncture can provide a significant benefit for children with headache with active laser treatment being clearly more effective than placebo laser treatment.

PMID:18022318 [PubMed - indexed for MEDLINE]

The effects of laser acupuncture on chronic tension headache--a randomised controlled trial.

[Ebneshahidi NS](#), [Heshmatipour M](#), [Moghaddami A](#), [Eghtesadi-Araghi P](#). *Acupunct Med*. 2005 Mar;23(1):13-8. Physical Therapy Dept, Isfahan University of Medical Sciences, Isfahan, Iran. na_sa_eb@yahoo.com **Abstract**

OBJECTIVE:

Headache affects the quality of life for many people throughout the world. Tension headache is among the commonest forms. Acupuncture is the most widely practised non-medicinal treatment for headaches. The purpose of this study was to explore the effects of laser acupuncture in this type of headache.

METHODS:

Fifty patients with chronic tension-type headache were randomly allocated to treatment or placebo groups. Patients in the treatment group received low energy laser acupuncture to LU7, LI4, GB14, and GB20 bilaterally. Points were irradiated for 43 seconds, and the intensity was 1.3J (approximately 13J/cm²). Ten sessions were given, three per week. The placebo group was treated in a similar way except that the output power of the equipment was set to zero. The outcome variables were headache intensity (VAS), duration of attacks, and number of days with a headache per month, by daily diary, assessed monthly to three months after treatment.

RESULTS:

There were significant differences between groups ($P < 0.001$) in changes from baseline in months one, two and three, in median score for headache intensity (treatment group -5, -3 and -2, placebo group -1, 0 and 0), median duration of attacks (treatment group -6,



-4 and -4, placebo group -1, 0 and 0 hours), and median number of days with headache per month (treatment group -15, -10 and -8, placebo group -2, 0 and 0).

CONCLUSION:

This study suggests that laser acupuncture may be an effective treatment for chronic tension-type headache, but the results should be confirmed in larger and more rigorous trials.

PMID:15844435 [PubMed - indexed for MEDLINE]

Applying of low level laser therapy for treatment of migraine

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6th international Laser in medicine WALT congress in Cyprus (2006)

Key words: Low-level laser, Pain, Migraine.

Aim:

The effects of laser therapy on pain attenuation are told and were established. The aim of this study was the measurement of low-level laser therapy effect on pain reduction in migraine because of its high pain number and its effect on normal life.

Method & patients: In a randomized double blind (case –control) study 30 patients were divided in two groups (n = 15). each group was treated with low level laser for 10 sessions on base one other days .Case group was treated with laser set in on situation (P =100 w wl =890 nm f = 1500 Hz &t = 200 ns D = 3 j/cm²) and control group was treated with laser set in off situation . None of the patients knew about the laser situation .All the patients were allowed to consume acetaminophen and ergotamine –compound if they needed. Patients pain number =PN (according to visual Analog scale = VAS) , the number of headache days per week and the amount of drug consumptions were measured before, at the end of treatment and 6 months later by a neurologist who was blind about the patients allocations in the groups.

Results:

Results were analyzed by spss program and there was a significant deference (p <0.0001) between the groups for pain number, the number of headache days per week and the amount of drug consumption at the end of treatment and this deference was stayed for 6 months follow up .No side effects were reported.

Conclusion:



Laser therapy can be applied for pain attenuation and reduction in drug consumption successfully in migraine.

Effectiveness of low-level laser therapy in temporomandibular disorders: a systematic review and meta-analysis.

[Petrucci A](#), [Sgolastra F](#), [Gatto R](#), [Mattei A](#), [Monaco A.](#), Gnathology Department, School of Dentistry, University of L'Aquila, L'Aquila, Italy. petrucci.ambra@gmail.com [J Orofac Pain](#). 2011 Fall;25(4):298-307.

Abstract

AIM: To assess the scientific evidence on the efficacy of low-level laser therapy (LLLT) in the treatment of temporomandibular disorders (TMD).

METHODS:

The databases of PubMed, Science Direct, Cochrane Clinical Trials Register, and PEDro were manually and electronically searched up to February 2010. Two independent reviewers screened, extracted, and assessed the quality of the publications. A meta-analysis- was performed to quantify the pooled effect of LLLT on pain and function in patients with chronic TMD.

RESULTS:

The literature search identified 323 papers without overlap between selected databases, but after the two-phase study selection, only six randomized clinical trials (RCT) were included in the systematic review. The primary outcome of interest was the change in pain from baseline to endpoint. The pooled effect of LLLT on pain, measured through a visual analog scale with a mean difference of 7.77 mm (95% confidence interval [CI]: -2.49 to 18.02), was not statistically significant from placebo. Change from baseline to endpoint of secondary outcomes was 4.04 mm (95% CI 3.06 to 5.02) for mandibular maximum vertical opening; 1.64 mm (95% CI 0.10 to 3.17) for right lateral excursion and 1.90 mm (95% CI: -4.08 to 7.88) for left lateral excursion.

CONCLUSION:

Currently, there is no evidence to support the effectiveness of LLLT in the treatment of TMD.

PMID:22247925,[PubMed - indexed for MEDLINE]

Title: Low level laser therapy (LLLT) for NSAID resistant pain in knee Osteoarthritis (OA) (clinical study on 386 patients)

Authors: S. Mokmeli MD1, H.Attarian MD2, M. Hosseini MD3, S. Bishea3

Anesthesiologist, Medical Laser department, Milad Hospital, Tehran, Iran, The book of 6th international Laser in medicine WALT congress in Cyprus (2006) by Medimond Publisher.



Summary:

Knee Osteoarthritis (OA), is described as a chronic degeneration of the articular cartilage. Previous clinical studies have shown effectiveness of LLLT in reducing pain and inflammation. We studied herein the effects of LLLT on knee OA. After 6 week of NSAID consumption, 386 unsatisfied patients were treated by LLLT in 12 sessions with a diode laser ($\lambda = 860 \text{ nm}$). The effects of LLLT were assessed through P and S subscales of WOMAC and clinical examination at the beginning and at the end of 12th session of LLLT. There was statistically significant difference between pain number, night pain, morning stiffness, walking pain, supra patellar size and range of motion (ROM) ($p < 0.0001$) but non for stepping and start pain ($p = 0.3$) before and after the LLLT. We conclude that LLLT is an effective and side effect-free adjunctive therapeutic modality for NSAID-resistant pain of knee OA.

Laser acupuncture in knee osteoarthritis: a double-blind, randomized controlled study.

[Yurtkuran M](#), [Alp A](#), [Konur S](#), [Ozçakir S](#), [Bingol U](#). [Photomed Laser Surg](#). 2007 Feb;25(1):14-20.

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Abstract

OBJECTIVE:

The purpose of this study was to investigate the effects and minimum effective dose of laser acupuncture in knee osteoarthritis (KOA), and to determine if it is superior to placebo treatment (sham) in the evaluation of clinical-functional outcome and quality of life.

METHODS:

In this randomized, placebo-controlled study, patients with grade 2 and 3 primary KOA were selected. Group I ($n = 27$) received 904-nm low-level laser irradiation with 10 mW/cm² power density, 4 mW output power, 0.4 cm² spot size, 0.48 J dose per session, and 120-sec treatment time on the medial side of the knee to the acupuncture point Sp9. Group II ($n = 25$) received placebo-laser therapy at the same place on the same point. Patients in both of the groups had treatment 5 days per week (total duration of therapy was 10 days) and 20 min per day. The study was comprised of a 2-week (10-session) intervention. Participants were evaluated before treatment (baseline), after treatment (2nd week), and at the 12th week. In this double-blind study, a blind examiner carried out all outcome assessments. The main outcome measures were as follows: pain on movement (pVAS), 50-foot walking time (50 foot w), knee circumference (KC), medial tenderness score (MTS), Western Ontario and McMaster Universities osteoarthritis index (WOMAC), and Nottingham Health Profile (NHP).

RESULTS:



Statistically significant improvement was observed in PVAS, 50 foot w, and KC in group 1. In Group II, statistically significant improvement was observed in PVAS, 50 foot w, and WOMAC. When groups were compared with each other, the improvement observed in KC was superior in Group I at the 2(nd) week ($p = 0.005$).

CONCLUSION:

Laser acupuncture was found to be effective only in reducing periarticular swelling when compared with placebo laser.

PMID:17352632 [PubMed - indexed for MEDLINE]

Photobiomodulation of pain in carpal tunnel syndrome: review of seven laser therapy studies.

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In this review, seven studies using photoradiation to treat carpal tunnel syndrome (CTS) are discussed: two controlled studies that observed real laser to have a better effect than sham laser, to treat CTS; three openprotocol studies that observed real laser to have a beneficial effect to treat CTS; and two studies that did not observe real laser to have a better effect than a control condition, to treat CTS. In the five studies that observed beneficial effect from real laser, higher laser dosages (9 Joules, 12-30 Joules, 32 J/cm², 225 J/cm²) were used at the primary treatment sites (median nerve at the wrist, or cervical neck area), than dosages in the two studies where real laser was not observed to have a better effect than a control condition (1.8 Joules or 6 J/cm²). The average success rate across the first five studies was 84% (SD, 8.9; total hands = 171). The average pain duration prior to successful photoradiation was 2 years. Photoradiation is a promising new, conservative treatment for mild/moderate CTS cases (motor latency < 7 msec; needle EMG, normal). It is cost-effective compared to current treatments.

PMID:16706688 [PubMed - indexed for MEDLINE]

The effects of low level laser in clinical outcome and neurophysiological results of carpal tunnel syndrome.

[Shooshtari SM](#), [Badiee V](#), [Taghizadeh SH](#), [Nematollahi AH](#), [Amanollahi AH](#), [Grami MT](#). Shiraz University of medical science, Shiraz, Iran. Jazayeri1335@yahoo.com [Electromyogr Clin Neurophysiol](#). 2008 Jun-Jul;48(5):229-31.

Abstract

OBJECTIVES:

Carpal tunnel syndrome (CTS) is the most common neuropathy that can be diagnosed with confidence by the nerve conduction study (NCS). One of the recent treatments of CTS is the application of low power laser (LPL) therapy. The present study evaluates the effects of LPL irradiation through NCS and clinical signs and symptoms.

METHODS:

A total of 80 patients were included in this study. Diagnosis of CTS was based on both clinical examination and electromyographic (EMG) findings. Patients were randomly



assigned into two groups. Test group (group A) underwent laser therapy (9-11 joules/cm²) over the carpal tunnel area. Control group (group B) received sham laser therapy. Pain, hand grip strength, median proximal sensory and motor latencies, transcarpal median sensory nerve conduction (SNCV) were recorded. After fifteen sessions of irradiation (five times per week), parameters were recorded again and clinical symptoms were measured in both groups. Pain was evaluated by Visual Analog Scale (VAS; day-night). Hand grip was measured by Jamar dynamometer. Paired t-test and independent sample t-test were used for statistical analysis.

RESULTS:

There was a significant improvement in clinical symptoms and hand grip in group A ($p < 0.001$). Proximal median sensory latency, distal median motor latency and median sensory latencies were significantly decreased ($p < 0.001$). Transcarpal median SNCV increased significantly after laser irradiation ($p < 0.001$). There were no significant changes in group B except changes in clinical symptoms ($p < 0.001$).

CONCLUSIONS:

Laser therapy as a new conservative treatment is effective in treating CTS paresthesia and numbness and improves the subjects' power of hand grip and electrophysiological parameters.

PMID:18754533 [PubMed - indexed for MEDLINE]

Carpal tunnel syndrome treated with a diode laser: a controlled treatment of the transverse carpal ligament.

[Chang WD](#), [Wu JH](#), [Jiang JA](#), [Yeh CY](#), [Tsai CT](#). Department of Bio-Industrial Mechatronics Engineering, National Taiwan University, Taipei, Taiwan. [Photomed Laser Surg.](#) 2008 Dec;26(6):551-7.

Abstract

OBJECTIVE:

The purpose of this placebo-controlled study was to investigate the therapeutic effects of the 830-nm diode laser on carpal tunnel syndrome (CTS).

BACKGROUND DATA:

Many articles in the literature have demonstrated that low-level laser therapy (LLLT) may help to alleviate various types of nerve pain, especially for CTS treatment. We placed an 830-nm laser directly above the transverse carpal ligament, which is between the pisiform and navicular bones of the tested patients, to determine the therapeutic effect of LLLT.

MATERIALS AND METHODS:

Thirty-six patients with mild to moderate degree of CTS were randomly divided into two groups. The laser group received laser treatment (10 Hz, 50% duty cycle, 60 mW, 9.7 J/cm²), at 830 nm), and the placebo group received sham laser treatment. Both groups received treatment for 2 wk consisting of a 10-min laser irradiation session each day, 5 d a week. The therapeutic effects were assessed on symptoms and functional changes, and with nerve conduction studies (NCS), grip strength assessment, and with a visual analogue scale (VAS), soon after treatment and at 2-wk follow-up.

RESULTS:

Before treatment, there were no significant differences between the two groups for all assessments ($p > 0.05$). The VAS scores were significantly lower in the laser group than the placebo group after treatment and at follow-up ($p < 0.05$). After 2 wk of treatment, no significant differences were found in grip strengths



or for symptoms and functional assessments ($p > 0.05$). However, there were statistically significant differences in these variables at 2-wk follow-up ($p < 0.05$). Regarding the findings of NCS, there was no statistically significant difference between groups after treatment and at 2-wk follow-up.

CONCLUSIONS:

LLLT was effective in alleviating pain and symptoms, and in improving functional ability and finger and hand strength for mild and moderate CTS patients with no side effects.

PMID:19025407[PubMed - indexed for MEDLINE]

Comparing the effect of low level laser therapy with Celecoxib in knee osteoarthritis , 8th congress of WALT 2010 in Norway

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Background: Celecoxib is a cyclo-oxygenase inhibitor that is an accepted alternative medicine for NSAIDs in knee osteoarthritis (OA), particularly in patients at high risk of developing gastrointestinal events. Celecoxib produces significant improvements in pain and inflammation with lower side effects than NSAIDs. LLLT has been used for pain attenuation in different conditions. This study compares the effects of LLLT with celecoxib in knee OA.

Material and method:

64 patients with knee OA were allocated randomly in 2 groups ($n=32$). Group A consumed celecoxib 200 mg per day for 4 weeks and group B were treated by LLLT (3 sessions per week) for 4 weeks (**1**- $\lambda=860$ nm, peak power=100 W, $F=3000$ Hz, $\Delta t=180$ nsc, Area=1cm², Dose=6J/cm², points= at least 8 points, **2** - $\lambda = 650$ nm, $p=100$ mW, A=0.2cm², Dose =10J/cm² 2J/point, 2 points). Groups were evaluated by pain and stiffness subscale of WOMAC index, pain number (VAS), knee oedema and the range of motion to cause pain before and after the treatment (1 month later).

Results:

The results were analyzed with SPSS program (Fisher exact T test, Pair sample test). There was a significant difference between subjective and objective parameters before and after both celecoxib consumption and LLLT statistically (p value <0.001), however LLLT was more effective than celecoxib for attenuation of night pain, weight bearing pain, pain number and reduction of knee oedema (p value <0.001). No side effects were reported for LLLT.

Conclusion:

Our study showed that LLLT is more effective than celecoxib in pain and oedema reduction in knee OA.



Low level laser effects on pain to palpation and electromyographic activity in TMD patients: a double-blind, randomized, placebo-controlled study.

Venezian GC, da Silva MA, Mazzetto RG, Mazzetto MO. Department of Restorative Dentistry, School of Dentistry of Ribeirão Preto, University of São Paulo, Brazil. [Cranio](#). 2010 Apr;28(2):84-91.

Abstract

The purpose of this study was to evaluate the effect of diode laser (GaAlAs - 780 nm) on pain to palpation and electromyographic (EMG) activity of the masseter and anterior temporalis muscles. The laser was applied on the temporalis and masseter muscles twice a week (four weeks). Forty-eight (48) patients with myofascial pain were randomly assigned between actual and placebo treatments and between the energetic doses of 25 J/cm² and 60 J/cm², and were evaluated using VAS before, immediately after the final application, and 30 days after the laser treatment. Surface electromyography was performed with maximum dental clenching before and after laser therapy. The results show there were no significant statistical differences in the EMG activity between the groups before and after laser treatment. With regard to the pain at palpation, although both groups presented a significant difference in the symptoms before and after the treatment, only the active doses showed statistically significant reductions in pain level in all the regions of the palpated muscles. However, there was no significant statistical difference between groups (experimental and placebo). In conclusion, low level laser did not promote any changes in EMG activity. The treatment did, however, lessen the pain symptoms in the experimental groups.

PMID:20491229 [PubMed - indexed for MEDLINE]

Measurements of jaw movements and TMJ pain intensity in patients treated with GaAlAs laser.

Mazzetto MO, Hotta TH, Pizzo RC. Departamento de Odontologia Restauradora, Ribeirão Preto Dental School, University of São Paulo, Ribeirão Preto, SP, Brazil. mazzetto@forp.usp.br [Braz Dent J](#). 2010;21(4):356-60.

Abstract

The aim of this study was to evaluate the effectiveness of low-level laser therapy (LLLT) on the improvement of the mandibular movements and painful symptoms in individuals with temporomandibular disorders (TMD). Forty patients were randomly divided into two groups (n=20): Group 1 received the effective dose (GaAlAs laser λ 830 nm, 40 mW, 5J/cm²) and Group 2 received the placebo application (0 J/cm²), in continuous mode on the affected condyle lateral pole: superior, anterior, posterior, and posterior-inferior, twice a week during 4 weeks. Four evaluations were performed: E1 (before laser application), E2 (right after the last application), E3 (one week after the last application) and E4 (30 days after the last application). The Kruskal-Wallis test showed significant more improvements ($p < 0.01$) in painful symptoms in the treated group than in the placebo group. A significant improvement in the range of mandibular movements was observed when the results were compared between the groups at



E4. Laser application can be a supportive therapy in the treatment of TMD, since it resulted in the immediate decrease of painful symptoms and increased range of mandibular movements in the treated group. The same results were not observed in the placebo group.

PMID:20976388 [PubMed - indexed for MEDLINE]

Effects of low-level laser therapy on pain and scar formation after inguinal herniation surgery: a randomized controlled single-blind study.

[Carvalho RL](#), [Alcântara PS](#), [Kamamoto F](#), [Cressoni MD](#), [Casarotto RA](#). Postgraduate Program in

Rehabilitation Sciences, University of São Paulo, São Paulo, Brazil. [Photomed Laser Surg](#). 2010 Jun;28(3):417-22.

Abstract

OBJECTIVE:

The aim of this study was to investigate the efficacy of an infrared GaAlAs laser operating with a wavelength of 830 nm in the postsurgical scarring process after inguinal-hernia surgery.

BACKGROUND:

Low-level laser therapy (LLLT) has been shown to be beneficial in the tissue-repair process, as previously demonstrated in tissue culture and animal experiments. However, there is lack of studies on the effects of LLLT on postsurgical scarring of incisions in humans using an infrared 830-nm GaAlAs laser.

METHOD:

Twenty-eight patients who underwent surgery for inguinal hernias were randomly divided into an experimental group (G1) and a control group (G2). G1 received LLLT, with the first application performed 24 h after surgery and then on days 3, 5, and 7. The incisions were irradiated with an 830-nm diode laser operating with a continuous power output of 40 mW, a spot-size aperture of 0.08 cm² for 26 s, energy per point of 1.04 J, and an energy density of 13 J/cm². Ten points per scar were irradiated. Six months after surgery, both groups were reevaluated using the Vancouver Scar Scale (VSS), the Visual Analog Scale, and measurement of the scar thickness.

RESULTS:

G1 showed significantly better results in the VSS totals (2.14 +/- 1.51) compared with G2 (4.85 +/- 1.87); in the thickness measurements (0.11 cm) compared with G2 (0.19 cm); and in the malleability (0.14) compared with G2 (1.07). The pain score was also around 50% higher in G2.

CONCLUSION:

Infra-red LLLT (830 nm) applied after inguinal-hernia surgery was effective in preventing the formation of keloids. In addition, LLLT resulted in better scar appearance and quality 6 mo postsurgery.

PMID:19821701 [PubMed - indexed for MEDLINE]



Placebo-controlled randomized clinical trial of the effect two different low-level laser therapies (LLLT)--intraoral and extraoral--on trismus and facial swelling following surgical extraction of the lower third molar. [Lasers Med Sci.](#) 2010 Sep;25(5):641-5. Epub 2009 May 31. [Aras MH](#), [Güngörmüş M](#). Faculty

of Dentistry, Department of Oral and Maxillofacial Surgery, Gaziantep University, Gaziantep, Turkey.

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Abstract

The purpose of this study is to compare the effects of extraoral and intraoral low-level laser therapies (LLLT) on postoperative trismus and oedema following the removal of mandibular third molars. Forty-eight patients who were to undergo surgical removal of their lower third molars were studied. Patients were randomly allocated to one of three groups: extraoral LLLT, intraoral LLLT, or placebo. In the study, a Ga-Al-As diode laser device with a continuous wavelength of 808 nm was used, and the laser therapy was applied by using a 1 x 3-cm handpiece. The flat-top laser beam profile was used in this therapy. For both of the LLLT groups, laser energy was applied at 100 mW (0.1 W) for a total of 120 s (0.1 W x 120 s = 12 J). Patients in the extraoral-LLLT group (n = 16) received 12-J (4 J/cm²) low-level laser irradiation, and the laser was applied at the insertion point of the masseter muscle immediately after the operation. Patients in the intraoral-LLLT group (n = 16) received 12-J (4 J/cm²) low-level laser irradiation intraorally at the operation site 1 cm from the target tissue. In the placebo group (n = 16), the handpiece was inserted intraorally at the operation site and then was touched extraorally to the masseter muscle for 1 min at each site (120 s total), but the laser was not activated. The size of the interincisal opening and facial swelling were evaluated on the second and seventh postoperative days. At the second postoperative day, trismus (29.0 +/- 7.6 mm [p = 0.010]) and swelling (105.3 +/- 5.0 mm [p = 0.047]) in the extraoral-LLLT group were significantly less than in the placebo group (trismus: 21.1 +/- 7.6 mm, swelling: 109.1 +/- 4.4 mm). Trismus (39.6 +/- 9.0 mm [p = 0.002]) in the extraoral-LLLT group at the seventh postoperative day was also significantly less than in the placebo group (29.0 +/- 6.2 mm). However, at the seventh postoperative day in the intraoral-LLLT group, only trismus (35.6 +/- 8.5 [p = 0.002]) was significantly less than in the placebo group (29.0 +/- 6.2 mm). This study demonstrates that extraoral LLLT is more effective than intraoral LLLT for the reduction of postoperative trismus and swelling after extraction of the lower third molar.



Title: COMPARING THE EFFICACY OF LOW LEVEL LASER THERAPY (LLLT) WITH PHYSIOTHERAPY IN TREATMENT OF KNEE OSTEOARTHRITIS (OA)

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6th international Laser in medicine WALT congress in Cyprus (2006) by Medimond Publisher.

SUMMARY

Pain and improvement of life quality is the most important reasons which patients with knee Osteoarthritis seek the treatment. Physiotherapy and laser therapy are both done for pain reduction. The aim of this study is comparing the effect of LLLT and physiotherapy on OA of knee by measuring Pain Number, Range Of Motion and Patients' satisfaction. Patients' Paitients were divided into 2 groups (Laser (n=58), physiotherapy (n=51)) .Both groups were examined before and after treatment and 1 month later. Laser group was treated with a 860 nm diode laser set . The other group was treated with standard physiotherapy for knee for 12 sessions. Both laser therapy and physiotherapy reduced PN, and increased ROM but Laser therapy's effects stayed for a longer time and patients satisfaction was more than physiotherapy.

Keywords: laser, physiotherapy, osteoarthritis, knee, pain, range of motion

[Evaluation of low level laser and interferential current in the therapy of complex regional painsyndrome by infrared thermographic camera].

[Kocić M](#), [Lazović M](#), [Dimitrijević I](#), [Mancić D](#), [Stanković A](#). Klinicki centar Nis, Klinika za fizikalnu medicinu, rehabilitaciju i protetiku, Nis, Srbija. kocićm60@gmail.com

Abstract

BACKGROUND/AIM; Complex regional pain syndrom type I (CRPS I) is characterised by continuous regional pain, disproportional according to duration and intensity and to the sort of trauma or other lesion it was caused by. The aim of the study was to evaluate and compare, by using thermovision, the effects of low level laser therapy and therapy with interferential current in treatment of CRPS I.

METHODS:

The prospective randomized controlled clinical study included 45 patients with unilateral CRPS 1, after a fracture of the distal end of the radius, of the tibia and/or the fibula, treated in the Clinical Centre in Nis from 2004 to 2007. The group A consisted of 20 patients treated by low level laser therapy and kinesy-therapy, while the patients in the group B (n = 25) were treated by interferential current and kinesy-therapy. The regions of interest were filmed by a thermovision camera on both sides, before and after the 20



therapeutic procedures had been applied. Afterwards, the quantitative analysis and the comparing of thermograms taken before and after the applied therapy were performed.

RESULTS:

There was statistically significant decrease of the mean maximum temperature difference between the injured and the contralateral extremity after the therapy in comparison to the status before the therapy, with the patients of the group A ($p < 0.001$) as well as those of the group B ($p < 0.001$). The decrease was statistically significantly higher in the group A than in the group B ($p < 0.05$).

CONCLUSIONS:

By the use of the infrared thermovision we showed that in the treatment of CRPS I both physical medicine methods were effective, but the effectiveness of laser therapy was statistically significantly higher compared to that of the interferential current therapy.

PMID:20954414[PubMed - indexed for MEDLINE]

Efficacy of low level laser therapy associated with exercises in knee osteoarthritis: a randomized double-blind study.

[Alfredo PP](#), [Bjordal JM](#), [Dreyer SH](#), [Meneses SR](#), [Zagueti G](#), [Ovanessian V](#), [Fukuda TY](#), [Junior WS](#), [Martins](#)

[RÁ](#), [Casarotto RA](#), [Marques AP](#). Department of Speech Therapy, Physical Therapy and Occupational Therapy, School of Medicine, São Paulo University, São Paulo, Brazil. patriciaalfredo@usp.br [Clin Rehabil](#). 2012 Jun;26(6):523-33. Epub 2011 Dec 14.

Abstract

OBJECTIVES:

To estimate the effects of low level laser therapy in combination with a programme of exercises on pain, functionality, range of motion, muscular strength and quality of life in patients with osteoarthritis of the knee.

DESIGN: A randomized double-blind placebo-controlled trial with sequential allocation of patients to different treatment groups.

SETTING: Special Rehabilitation Services.

SUBJECTS: Forty participants with knee osteoarthritis, 2-4 osteoarthritis degree, aged between 50 and 75 years and both genders.

INTERVENTION:

Participants were randomized into one of two groups: the laser group (low level laser therapy dose of 3 J and exercises) or placebo group (placebo laser and exercises).

MAIN MEASURES:

Pain was assessed using a visual analogue scale (VAS), functionality using the Lequesne questionnaire, range of motion with a universal goniometer, muscular strength using a dynamometer, and activity using the Western Ontario and McMaster Universities Osteoarthritis(WOMAC) questionnaire at three time points: (T1) baseline, (T2) after the end of laser therapy (three weeks) and (T3) the end of the exercises (11 weeks).

RESULTS:



When comparing groups, significant differences in the activity were also found ($P = 0.03$). No other significant differences ($P > 0.05$) were observed in other variables. In intragroup analysis, participants in the laser group had significant improvement, relative to baseline, on pain ($P = 0.001$), range of motion ($P = 0.01$), functionality ($P = 0.001$) and activity ($P < 0.001$). No significant improvement was seen in the placebo group.

CONCLUSION:

Our findings suggest that low level laser therapy when associated with exercises is effective in yielding pain relief, function and activity on patients with osteoarthritis of the knees.

PMID:22169831[PubMed - in process]

Effects of low-level laser therapy at wavelengths of 660 and 808 nm in experimental model of osteoarthritis.

[da Rosa AS](#), [dos Santos AF](#), [da Silva MM](#), [Facco GG](#), [Perreira DM](#), [Alves AC](#), [Leal Junior EC](#), [de Carvalho Pde T](#). [Photochem Photobiol](#). 2012 Jan-Feb;88(1):161-6. doi: 10.1111/j.1751-1097.2011.01032.x. Epub 2011 Dec 16., Post Graduation Program for Health and Development of the Central-West Region, Federal University of Mato Grosso do Sul, Campo Grande, Mato Grosso do Sul, Brazil.

Abstract

The aim of the present study was to analyze the influence of low-level laser radiation at wavelengths of 660 and 808 nm in an experimental model of osteoarthritis (OA). The sample was composed of 36 male adult Wistar rats divided into three groups (G1, G2 and G3). For the induction of cartilage injury, three injections of 4% papain and 10 μ L of a cysteine solution were performed at right knee of the hind leg. Two weeks after the last injection, group G1 was treated with InGaAlP (660 nm, 100 mW, 3.57 W cm^{-2} , 40 s) and G2 was treated with AsGaAl (808 nm, 100 mW, 3.57 W cm^{-2} , 40 s) both with energy of 4 J. There were significant differences in the type of squamous epithelium between days 7 and 14 in G2 ($P < 0.05$) and on day 14 between G1 and G2 ($P < 0.05$). Moreover, statistically significant differences were found in the formation of new blood vessels between G1 and G3 on days 7 and 21 as well as between G2 and G3 on day 21. The formation of fibrotic tissue was greater in G3 ($P < 0.05$). In conclusion, laser therapy, especially at a wavelength of 808 nm, stimulated angiogenesis and reduced the formation of fibrosis in an experimental model of OA. © 2011 Wiley Periodicals, Inc. Photochemistry and Photobiology © 2011 The American Society of Photobiology. PMID:22053992[PubMed - indexed for MEDLINE]

Treatment of persistent idiopathic facial pain (PIFP) with a low-

level energy diode laser. [Yang HW](#), [Huang YF](#). [Photomed Laser Surg](#). 2011 Oct;29(10):707-

10. Epub 2011 Sep 9. Oral Medicine Center, Chung Shan Medical University Hospital, 110 Jiang-Guo N. Road, Section 1, Taichung City, Taiwan.

Abstract

**OBJECTIVE:**

The purpose of this study was to test the therapeutic efficacy of low- level energy diode laser on persistent idiopathic facial pain (PIFP).

BACKGROUND DATA:

PIFP has presented a diagnosis and management challenge to clinicians. Many patients were misdiagnosed, which resulted in unnecessary dental procedures. Low-level energy diode laser therapy has been applied to different chronic and acute pain disorders, including neck, back, and myofascial pain; degenerative osteoarthritis; and headache, and it may be an effective alternative treatment for PIFP.

METHODS:

A total of 16 patients, who were diagnosed with PIFP, were treated with an 800-nm wavelength diode laser. A straight handpiece having an end size of 0.8 cm in diameter, or an angled handpiece with an end size of 0.5 cm in diameter was used. When laser was applied, the handpiece directly contacted the involved symptomatic region with an energy density of 105 J/cm². Overall pain and discomfort was analyzed with a 10-cm visual analogue scale (VAS) before and after treatment.

RESULTS:

All patients received diode laser therapy between 1 and 10 times. The average pain score was 7.4 before the treatment (ranging from 2.9 to 9.8), and 4.1 after the treatment. An average pain reduction of 43.87% (ranging from 9.3% to 91.8%) was achieved. The pain remained unchanged at a lower level for up to 12 months.

CONCLUSIONS:

Low-level energy diode laser may be an effective treatment for PIFP.

PMID:21905852[PubMed - indexed for MEDLINE]

Comparison of 3 physical therapy modalities for acute pain in lumbar disc herniation measured by clinical evaluation and magnetic resonance imaging. [J Manipulative Physiol Ther.](#) 2008 Mar;31(3):191-8.[Unlu](#)

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OBJECTIVE:

This study measures and compares the outcome of traction, ultrasound, and low-power laser (LPL) therapies by using magnetic resonance imaging and clinical parameters in patients presenting with acute leg pain and low back pain caused by lumbar disc herniation (LDH).

METHODS:

A total of 60 patients were enrolled in this study and randomly assigned into 1 of 3 groups equally according to the therapies applied, either with traction, ultrasound, or LPL. Treatment consisted of 15 sessions over a period of 3 weeks. Magnetic resonance imaging examinations were done before and immediately after the treatment. Physical examination of the lumbar spine, severity of pain, functional disability by Roland



Disability Questionnaire, and Modified Oswestry Disability Questionnaire were assessed at baseline, immediately after, and at 1 and 3 months after treatment.

RESULTS:

There were significant reductions in pain and disability scores between baseline and follow-up periods, but there was not a significant difference between the 3 treatment groups at any of the 4 interview times. There were significant reductions of size of the herniated mass on magnetic resonance imaging after treatment, but no differences between groups.

CONCLUSIONS:

This study showed that traction, ultrasound, and LPL therapies were all effective in the treatment of this group of patients with acute LDH. These results suggest that conservative measures such as traction, laser, and ultrasound treatments might have an important role in the treatment of acute LDH.

PMID:18394495[PubMed - indexed for MEDLINE]

Title: Comparison between the effects of low level laser Therapy (LLLT) and Magnetic Low Level Laser Therapy (MLLLT) in treatment of knee Osteoarthritis (OA)

Authors: N. Soroor MD, S. Mokmeli MD-Anesthesiologist ,H.Attarian, Rheumatologist
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,Osteoarthritis, Low level Laser, Magnetic, Knee, Pain :**Keywords**

Summary: Because of the long term application and side effects of the drugs, Osteoarthritis needs a safe and cost effective treatment. The effects of low level laser therapy (LLLT) and magnet therapy have been discussed in the treatment of inflammatoryand degenerative diseases. 50 OA knees were allocated in two groups [Case (MLLLT) and control (LLLT)] and were treated for 12 sessions. The effects of therapy were assessed through P and S subscales of WOMAC index and clinical examinations at the end of 12th session. The results analysis performed by SPSS program showed good changes in P and S subscales of WOMAC index with both methods, but the mean difference of walking duration which causes pain was significantly lower in MLLLT and pain reaction was appeared in MLLLT .while there was no pain reaction in LLLT, which it may be due to over dose effect of magnetic field, so we can use both methods for pain managing in knee OA but the dose should be reduced in MLLLT.



The effect of low-level laser in knee osteoarthritis: a double-blind, randomized, placebo-controlled trial. [Photomed Laser Surg.](#) 2009 Aug;27(4):577-84., [Hegedus B](#), [Viharos L](#), [Gervain](#)

[M](#), [Gálfi M.](#), Physio- and Balneotherapy Center, Orosháza-Gyopáros, Hungary. arthrodent@freemail.hu

Abstract

INTRODUCTION:

Low-level laser therapy (LLLT) is thought to have an analgesic effect as well as a biomodulatory effect on microcirculation. This study was designed to examine the pain-relieving effect of LLLT and possible microcirculatory changes measured by thermography in patients with knee osteoarthritis (KOA).

MATERIALS AND METHODS:

Patients with mild or moderate KOA were randomized to receive either LLLT or placebo LLLT. Treatments were delivered twice a week over a period of 4 wk with a diode laser (wavelength 830 nm, continuous wave, power 50 mW) in skin contact at a dose of 6 J/point. The placebo control group was treated with an ineffective probe (power 0.5 mW) of the same appearance. Before examinations and immediately, 2 wk, and 2 mo after completing the therapy, thermography was performed (bilateral comparative thermograph by AGA infrared camera); joint flexion, circumference, and pressure sensitivity were measured; and the visual analogue scale was recorded.

RESULTS:

In the group treated with active LLLT, a significant improvement was found in pain (before treatment [BT]: 5.75; 2 mo after treatment : 1.18); circumference (BT: 40.45; AT: 39.86); pressure sensitivity (BT: 2.33; AT: 0.77); and flexion (BT: 105.83; AT: 122.94). In the placebo group, changes in joint flexion and pain were not significant.

Thermographic measurements showed at least a 0.5 degrees C increase in temperature--and thus an improvement in circulation compared to the initial values. In the placebo group, these changes did not occur.

CONCLUSION:

Our results show that LLLT reduces pain in KOA and improves microcirculation in the irradiated area.

PMID:19530911[PubMed - indexed for MEDLINE] PMCID:PMC2957068[Links](#)

[Laser puncture in the treatment of reflectory manifestations of lumbosacral osteochondrosis in elderly patients in geriatric hospital]

[Article in Ukrainian][Dzhuzha TV](#). [Lik Sprava](#). 2004 Oct-Nov;(7):65-70.

Peculiarities of involution age are of great importance choosing treatment methods. Laser puncture was shown to be an effective method in treatment of pain syndromes in elder patients with lumbosackul radiculitis. Combination of



pharmacotherapy, laser stimulation, acupuncture, vacuum massage, biphosphite use enhances considerably efficiency of the treatment.

PMID: 15724619 [PubMed - indexed for MEDLINE]

[Laser therapy in the treatment of the discogenic neurological manifestations of spinal osteochondrosis]

[Article in Russian] [Miriutova NF](#). [Vopr Kurortol Fizioter Lech Fiz Kult](#). 2000 May-Jun;(3):30-3

Traction is one of the methods in pathogenetic therapy of spinal osteochondrosis (SO), but not all the traction techniques can be applied in the acute stage: the antalgic posture, impaired motor activity create difficulties for conducting procedures while the acute process endangers paradoxical reaction to the treatment. Adjuvant laser therapy reduces pain syndrome and enhances functional capacities of the neuromotor system thus providing favourable conditions for spinal traction.

PMID: 10925669 [PubMed - indexed for MEDLINE]

Efficacy of low power laser therapy and exercise on pain and functions in chronic low back pain.

- [Gur A](#), [Karakoc M](#), [Cevik R](#), [Nas K](#), [Sarac AJ](#), [Karakoc M](#). [Lasers Surg Med](#). 2003;32(3):233-8

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BACKGROUND AND OBJECTIVES: The aim of this study was to determine whether low power laser therapy (Gallium-Arsenide) is useful or not for the therapy of chronic low back pain (LBP). **STUDY DESIGN/MATERIALS AND METHODS:** This study included 75 patients (laser + exercise-25, laser alone-25, and exercise alone-25) with LBP. Visual analogue scale (VAS), Schober test, flexion and lateral flexion measures, Roland Disability Questionnaire (RDQ) and Modified Oswestry Disability Questionnaire (MODQ) were used in the clinical and functional evaluations pre and post therapeutically. A physician, who was not aware of the therapy undertaken, evaluated the patients. **RESULTS:** Significant improvements were noted in all groups with respect to all outcome parameters, except lateral flexion ($P < 0.05$). **CONCLUSIONS:** Low

power laser therapy seemed to be an effective method in reducing pain and functional disability in the therapy of chronic LBP. Copyright 2003 Wiley-Liss, Inc. PMID: 12605431 [PubMed - indexed for MEDLINE]

[The treatment results in a persistent pain syndrome in the neurological manifestation of lumbosacral osteochondrosis using osteoperiosteal electro- and laser puncture]

[Article in Russian] [Macheret EL](#), [Makhmud AI](#), [Chuprina GN](#). [Lik Sprava](#). 2000 Jul-Aug;(5):124-5

The use of osteoperiosteal electropuncture and laser puncture combined in a complex treatment of 162 patients with lumbosacral osteochondrosis resulted in dissipation or apparent decrement in clinical manifestations of the trouble. In patients with lumboischialgia, there was an improvement in the pain syndrome as evidenced by scores on global painfulness (2.3 +/- 0.45 versus 30.2 +/- 0.62 before the treatment) in patients with degree IV pain. Less intensive pain (degree II-III as to I. P. Antonov) has gone away completely. In radicular pain syndrome, results on pain relief were much lower ($P < 0.05$), those on total vertebral and extravertebral painfulness much better (2.4 +/- 0.2 versus 17.3 +/- 0.7 and 1.2 +/- 0.6 versus 30.4 +/- 1.82 respectively). The secured results of treatment remained stable during two years.

PMID: 11031473 [PubMed - indexed for MEDLINE]

Outcome measures in osteoarthritis: randomized controlled trials.

- [Strand V](#), [Kelman A](#).

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Accepted outcome measures in randomized controlled trials (RCTs) in osteoarthritis (OA) include patient-reported assessments of physical function and health-related quality of life (HRQOL). Available data can inform treatment decisions when statistically significant changes are viewed in terms of clinically important improvements. Patient-reported outcomes validated in OA include global assessments of pain, disease activity, and disease-specific and generic measures of physical function and HRQOL. Definitions of minimum clinically

important differences (MCID) have been derived from RCTs with physical therapy, nonsteroidal anti-inflammatory drugs (NSAIDs), and cyclooxygenase-2 selective agents. Definitions of MCID should serve only as guidelines based on mean changes in a treatment group, and do not necessarily reflect clinically meaningful improvements for an individual patient. They help to interpret data across treatments and patient populations. Definitions of MCID may differ for the type of intervention assessed; additional methodologic issues must be addressed when evaluating nonpharmacologic treatments. Based on RCTs in OA evaluating physical therapy, cyclooxygenase-2 agents, and NSAIDs, the Western Ontario and McMaster Osteoarthritis Index is valid, reliable, sensitive to change, and correlates closely with the generic Medical Outcomes Survey Short-Form 36 measure of HRQOL. When evaluating RCT data, understanding derivation and MCID values of outcome measures facilitates informed therapeutic decisions regarding therapeutic interventions.

PMID: 14713399 [PubMed - indexed for MEDLINE]

1: [Spine](#). 1996 Dec 15;21(24):2840-9; discussion 2849-50.

Drug therapy for back pain. Which drugs help which patients?

- [Deyo RA](#).

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STUDY DESIGN: A brief review of current literature and issues on drug therapy for low back pain. **OBJECTIVES:** To identify current knowledge and future research needs related to drug therapy. **SUMMARY OF BACKGROUND DATA:** Drug therapy is one of many possible treatment choices for symptom relief in patients with low back pain. The variety of drugs used suggests that there is no uniquely successful form of drug therapy. One reason for uncertainty and slow progress in this area is the limited quality of many clinical trials for back pain, with inadequate description of patients and outcomes being common deficits. **METHODS:** A selective review of randomized trials and systematic literature syntheses on drug therapy is given. **RESULTS:** Despite limitations, there is good evidence to support the efficacy of nonsteroidal anti-inflammatory drugs for acute low back pain and fair evidence for the use of muscle relaxants. There is greater controversy about the use of corticosteroids, which have been administered orally, intramuscularly, and epidurally. There is conflicting evidence regarding epidural injection of corticosteroids, but one meta-analysis suggests they may provide a small symptomatic improvement for patients with radiculopathy. Trials of systemic steroids and antidepressant drugs for

managing chronic pain are inconclusive. The only randomized trial of local anesthetic injection into trigger points suggested that this treatment was equivalent to that of saline injection, needling without injection, or vapo-coolant spray alone. CONCLUSION: It seems reasonable to recommend acetaminophen or nonsteroidal anti-inflammatory drugs for patients with acute back pain, with efforts to minimize costs and complications. Muscle relaxants and narcotic analgesics may be appropriate for some patients, but selection criteria are unclear, and these drugs should be prescribed for fixed periods. Drug treatment for chronic low back pain is less clear, and a current controversy centers on the use of chronic narcotic analgesics for such patients. Future research should include evaluating combinations of medications, combinations of medication and physical therapy, systemic corticosteroid therapy, trigger point injections, and narcotic use for patients with chronic pain. Spinal stenosis is common in the older population, and more drug trials are needed for this condition.

PMID: 9112708 [PubMed - indexed for MEDLINE]

ACP J Club. 2000 Jan-Feb;132(1):23.

The effectiveness of acupuncture in the management of acute and chronic low back pain. A systematic review within the framework of the Cochrane Collaboration Back Review Group.

[van Tulder MW](#), [Cherkin DC](#), [Berman B](#), [Lao L](#), [Koes BW](#).

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STUDY DESIGN: A systematic review of randomized controlled trials. OBJECTIVES: To evaluate the efficacy and effectiveness of acupuncture for the management of nonspecific low back pain. SUMMARY OF BACKGROUND DATA: Acupuncture is one of the oldest forms of therapy, but little is known about the effectiveness of acupuncture for low back pain. METHODS: Randomized controlled trials were done to assess the effectiveness of all types of acupuncture treatment, which involves needling for subjects with nonspecific low back pain. Two reviewers blinded with respect to authors, institution, and journal independently assessed the methodologic quality of the studies. Because data were statistically and clinically too heterogeneous, a qualitative review was performed. The evidence was classified into four levels: strong, moderate, limited, or no evidence. RESULTS: Eleven randomized controlled



trials were included. Overall, the methodologic quality was low. Only two studies met the preset "high quality" level for this review. No study clearly evaluated acupuncture for acute low back pain. The results indicate that there was no evidence showing acupuncture to be more effective than no treatment. There was moderate evidence indicating that acupuncture is not more effective than trigger-point injection or transcutaneous electrical nerve stimulation, and there was limited evidence that acupuncture is not more effective than placebo or sham acupuncture for the management of chronic low back pain.

CONCLUSIONS: Because this systematic review did not clearly indicate that acupuncture is effective in the management of back pain, the authors would not recommend acupuncture as a regular treatment for patients with low back pain. There clearly is a need for more high-quality randomized controlled trials.

PMID: 10361661 [PubMed - indexed for MEDLINE]

Non-steroidal anti-inflammatory drugs for low back pain.

[van Tulder MW](#), [Scholten RJ](#), [Koes BW](#), [Deyo RA](#).]

- : [Cochrane Database Syst Rev](#). 2000;(2):CD000396

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BACKGROUND: Non-steroidal anti-inflammatory drugs (NSAIDs) are the most frequently prescribed medications worldwide and are widely used for patients with low back pain. **OBJECTIVES:** The objective of this systematic review was to assess the effects of NSAIDs in the treatment of non-specific low back pain and to assess which type of NSAID is most effective. **SEARCH STRATEGY:** We searched the Medline and Embase databases and the Cochrane Controlled Trials Register (CCTR) up to and including September 1998 if reported in English, Dutch or German. We also screened references given in relevant reviews and identified trials. **SELECTION CRITERIA:** Randomised trials and double-blind controlled trials of NSAIDs in non-specific low back pain with or without radiation were included. **DATA COLLECTION AND ANALYSIS:** Two reviewers blinded with respect to authors, institution and journal independently extracted data and assessed methodological quality. A methodological quality score was applied, and studies meeting at least six of 11 specified criteria were considered high quality studies. If data were considered clinically homogeneous, a meta-analysis was performed using a fixed effects model for statistically homogeneous subgroups and a random effects model for statistically heterogeneous subgroups. If data were considered clinically heterogeneous, a qualitative analysis was performed using a rating system with four levels of evidence (strong, moderate, limited, no). **MAIN RESULTS:** A



total of 51 trials (total number of patients = 6057) were included in this review, of which 46 were published in English and five in German. Sixteen trials (31%) were of high quality. The pooled Relative Risk for global improvement after one week was 1.24 (95% CI 1.10, 1.41) and for additional analgesic use 1.29 (95% CI 1.05, 1.57), indicating a statistically significant effect in favour of NSAIDs compared to placebo. The results of the qualitative analysis showed that there is conflicting evidence (level 3) that NSAIDs are more effective than paracetamol for acute low back pain, and that there is moderate evidence (level 2) that NSAIDs are not more effective than other drugs for acute low back pain. There is strong evidence (level 1) that various types of NSAIDs are equally effective for acute low back pain. REVIEWER'S CONCLUSIONS: In conclusion, the evidence from the 51 trials included in this review suggests that NSAIDs are effective for short-term symptomatic relief in patients with acute low back pain. Furthermore, there does not seem to be a specific type of NSAID which is clearly more effective than others. Sufficient evidence on chronic low back pain is still lacking. PMID: 10796356 [PubMed - indexed for MEDLINE

Low energy laser in the treatment of low back pain

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Low back pain is felt in the low lumbar, lumbosacral, or sacroiliac region. Most low back pain is related to acute ligamentous (sprain) or muscular (strain) problems, which tend to be self limited, or to the more chronic osteoarthritis or ankylosing spondylitis of the lumbar area.

The aim of the study was to explore the pain-alleviating effect of low energy laser in low back pain. Thirty-five patients with low back pain have been treated with helium-neon laser type "Bistra" with wavelength 630 nm, average output 15 mW and an irradiance of 250 mW/cm². The laser was locally applied to 11 sites on and around the low back. After scanning each point was treated for 30 sec, five times weekly for a total of ten treatments. The statistical analysis showed that the laser treated patients had a significant faster pain-alleviating effect compared with the 30 patients treated with medicaments only. Subjective response have been achieved after first three treatments. Irradia laser treatment may be a valuable therapy in low back pain and low energy laser can be employed as a pain relieving method.



1: [Wiad Lek.](#) 1990 Jun 1;43(11):511-6. [Links](#)

[Infrared laser radiation in the treatment of low back pain syndrome]

[Article in Polish]

- [Mika T.](#), [Orlow H.](#), [Kuszelewski Z.](#)

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The effectiveness was estimated of infrared laser radiation in the treatment of low back pain syndrome. The patients received irradiation from a semiconductor laser. The results were evaluated in 82 patients using a questionnaire of pain, taking into account its intensity, frequency, taking of analgesics, and the motor activity of the patient. The results suggest a favourable effect of infrared laser radiation on pain.

PMID: 2145700 [PubMed - indexed for MEDLINE]