

**Effectiveness Of Low-Level Laser Therapy In Temporomandibular Disorder**

Scand J Rheumatol. 2003;32(2):114-8.

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**OBJECTIVE:** To investigate the effectiveness of low-level laser therapy in the treatment of temporomandibular disorder and to compare treatment effects in myogenic and arthrogenic cases.

**METHODS:** Thirty-five patients were evaluated by magnetic resonance imaging and randomly allocated to active treatment (n=20) and placebo treatment (n= 15) groups. In addition to a daily exercise program, all patients were treated with fifteen sessions of low-level laser therapy. Pain, joint motion, number of joint sounds and tender points were assessed.

**RESULTS:** Significant reduction in pain was observed in both active and placebo treatment groups. Active and passive maximum mouth opening, lateral motion, number of tender points were significantly improved only in the active treatment group. Treatment effects in myogenic and arthrogenic cases were similar.

**CONCLUSION:** Low-level laser therapy can be considered as an alternative physical modality in the management of temporomandibular disorder.

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**Clinical Evaluation Of The Low Intensity Laser Antialgic Action Of GaAIAs (wavelength=785 nm) In The Treatment Of The Temporomandibular Disorders**

Laser Med Surg Abstract issue, 2002: 18.

Sanseverino N T M, Sanseverino C A M, Ribeiro M S et al.

The improved outcome of laser therapy, if higher doses are given, is documented in the study by Sanseverino 10 patients with pain and limitation of movements of the jaw were treated by 785 nm GaAIAs laser, dose 45 J/cm<sup>2</sup>. The joint and tender points in the masticatory and otherwise involved muscles was applied three times per week during three weeks. A control group of 10 patients was given sham laser therapy. The evaluation was performed through subjective pain assessment and measurement of the movements of the jaw. There was a significant improvement in the laser group only.

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**Clinical Evaluation Of The Low Intensity Laser Antialgic Action Of GaAlAs In The Treatment Of The Temporomandibular Disorders. 2001**

SANSEVERINO, N. T. M.

Dissertation (Professional Master's Degree "Lasers in Dentistry") - Nuclear and Energy Research Institute / School of Dentistry, University of São Paulo, São Paulo. Advisor: Eduardo De Bortoli Groth, DDS, PhD, Martha Simões Ribeiro, DDS, PhD

The therapy with laser emitting low intensity has been currently used in the most diverse fields of medicine as therapeutic conduct for pain. It is a non-invasive, painless, non-thermal and aseptic type therapy, without any collateral effects, having a good cost/benefit relationship. However, for the therapy with low-intensity laser to result in positive effects, a correct diagnosis is fundamental, as well as a protocol of adequate application. In odontology, the majority of patients diagnosed with temporomandibular disorders (TMD), present pain and limitations in the movements of the jaw. In this work, a GaAlAs laser emitting low intensity, was used, λ=785nm, in patients having a dysfunction of the temporomandibular joint with a complaint of pain. Twenty patients were divided into two groups. The group treated received laser treatment in the temporomandibular

articulations and in the muscles affected. The dose applied was 45J/cm<sup>2</sup>, while the ten patients in the control group received 0J/cm<sup>2</sup>, in a total of nine applications, carried out three times a week, during three weeks. The evaluation of the patients was made through clinical examinations of manual palpation of the masseter, temporal, cervical, posterior neck and sternocleidomastoid muscles, and measurements of opening and laterality of the mouth. The results obtained showed a diminishing of the pain and an increase of the mandibular mobility in the patients treated, when compared to the control group. These results point to this therapy as being an important tool in the treatment of pain in patients with a dysfunction in the TMJ, indicating this therapeutic modality as a co-adjuvant in these treatments.

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### **Low Intensity Laser Therapy (Lilt) In The Maxillofacial Region**

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The region of the face and mouth is well suited to Low Intensity Laser Therapy (LILT) in view of ease of access. It is also an area associated with a variety of painful conditions and intractable ulcers which have proved amenable to LILT in a total of around 500 cases. Our practice is based on several postgraduate research projects:

1. Studies of depth penetration of 820nm. These have been undertaken using a CCD camera to demonstrate penetration depths in non vital tissue specimens augmented by observations in the living subject with isotropic detectors.

2. Investigation of vascular response. A thermographic camera has been used for local heating effects while laser doppler has been employed to measure microcirculatory flux. Ultrasound doppler allowed monitoring of arterial status. A variety of wavelengths and fluxes have been investigated.

3. Double blind clinical trial in temporomandibular joint disorder pain. Methods have included algometry for pressure point thresholds, electromyography for muscular activity and sensor tracking for mandibular movement.

4. Study of effect on osseointegration of implants in jaw and femur. Research methods have involved mechanical push out testing, radiovisiography, x-ray microtomography and histomorphometry in the rabbit experimental model. On the basis of the data acquired clinical practice has been undertaken particularly in the following conditions:

1. Post Herpetic Neuralgia,
2. Temporomandibular Joint Disorder Pain
3. Trigeminal Neuralgia
4. Atypical Facial Pain,
5. Pain from Acute Maxillofacial Trauma
6. Palliation of Pain from Unresectable Orofacial Cancer,
7. Intractable Oral Ulcerations, 8. Nerve Lesions,
9. Cavernous Haemangiomas Of the Facial Region in Infants

The results of this clinical practice are described and analyzed.

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**Low-Level Laser Therapy Is An Important Tool To Treat Disorders In The Maxillofacial Region**

J Clinical Laser Med & Surg. 1998; 16 (4): 223-226.  
Pinheiro A et al.

241 patients with different disorders in the maxillofacial region were treated with LLLT. Indications were temporomandibular disorders, trigeminal neuralgia, muscular pain, aphtae etc. Lasers of 633, 670 and 830 nm were used. Most treatments consisted of a series of 12 applications (twice a week). Average dose was 1.8 J/cm<sup>2</sup>. At the end of treatment 154 patients were asymptomatic, 50 improved considerably and 37 were symptomatic.

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**PhD Dissertation on TMD Problems**

Dr Sajee Sattayut of The Department of Oral & Maxillofacial Surgery, St Bartholomew's and the Royal London School of Medicine and Dentistry (professor Paul Bradley) has put forward his PhD thesis on the effect of 820 nm low level laser on patients with TMD (temporo-mandibular-joint-disorders). In a double blind study on 30 female TMD patients one group was given placebo laser, one a low dose from a 60 mW laser and the third a high dose from a 300 mW GaAlAs laser. Three treatments were given during one week. The patients in the high energy density group had significantly increases in Pressure Pain Threshold and EMG amplitude, recorded from voluntary clenching. A significantly greater number of patients recovered from myofascial pain and TMJ arthralgia as assessed clinically in the higher energy group. At a period of 2 to 4 weeks review after LLLT, there was an average 52% reduction of pain as assessed by Symptom Severity Index pain questionnaire. In an in vitro study laser was observed to reduce IL-1 stimulated PGE<sub>2</sub> production.

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**A Systematic Review Of Low Level Laser Therapy With Location-Specific Doses For Pain From Chronic Joint Disorders**

Australian J Physiother. 2003; 49: 107-116. Bjordal J M, Couppè, C, Chow R, Tunér J, Ljunggren A E.

The authors investigated if low level laser therapy of the joint capsule can reduce pain in chronic joint disorders (CJD). A literature search identified 88 randomised-controlled trials, of which 20 trials included patients with CJD. Six trials had to be excluded for not irradiating the joint capsule. Three trials used doses lower than a denominated a priori dose range for reducing inflammation in the joint capsule. These trials found nosignificant difference between active and placebo treatments. The remaining 11 trials, including 565 patients, were of acceptable methodological quality with an average PEDro score of 6.9 (range 5-9). In these trials, LLLT within the suggested dose-range was administered to the knee, temporomandibular and zygapophyseal joints. The results showed a mean weighted difference in change of pain on VAS by 45.6 % (95 % CI 35.0 to 56.2) in favour of LLLT. Global status was improved for 33.4 % (95% CI 20.9 to 45.9) more patients in the LLLT group. LLLT with the suggested dose range significantly reduces pain in CJD, but the heterogeneity in patient samples, treatment procedures and trial design calls for cautious interpretation of the results.

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**Low Level Laser Therapy In The Treatment Of Temporomandibular Disorders (TMD): A Double-Blind Pilot Study**

Cranio. 1997 Apr;15(2):144-9.

Conti PC.

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The aim of this paper was to evaluate the efficacy of a Low-Level Laser therapy in patients with Temporomandibular Disorders (TMD) using a double-blind design. A sample of 20 patients with a chief complaint of pain was divided into myogenous and arthrogeous groups. The sample was also divided on the basis of the treatment rendered: real versus placebo treatment. An 830 nm Ga-Al-As Laser device with a energy power of 4 joules was used (OMNILASE, LASERDYNE PTY LTD.) in three treatment sessions.

To evaluate the effectiveness of laser treatment, a Visual Analogue Scale (VAS) was used for pain and active range of motion (AROM) was used to measure changes in mandibular function. Using real laser treatment, the author found that there was a reported improvement in pain only for the myogenous pain patients ( $p < \text{or} = 0.02$ ). For the arthrogeous pain patients, real laser treatment resulted in an improvement in Total Vertical Opening (TVO) ( $p < 0.05$ ), Protrusive excursion (PROT) ( $p < 0.02$ ) and Left lateral excursion (LATLEF) ( $p < 0.02$ ). The placebo control group showed improvement in TVO and PROT for those patients having myogenous pain and LATLEF for those patients having arthrogeous pain. A repeated measurement one-way ANOVA demonstrated no significant differences between real and placebo groups. Considering the non-invasive and harmless characteristics of this modality, more research is recommended, using higher power and increased frequency of laser applications.

