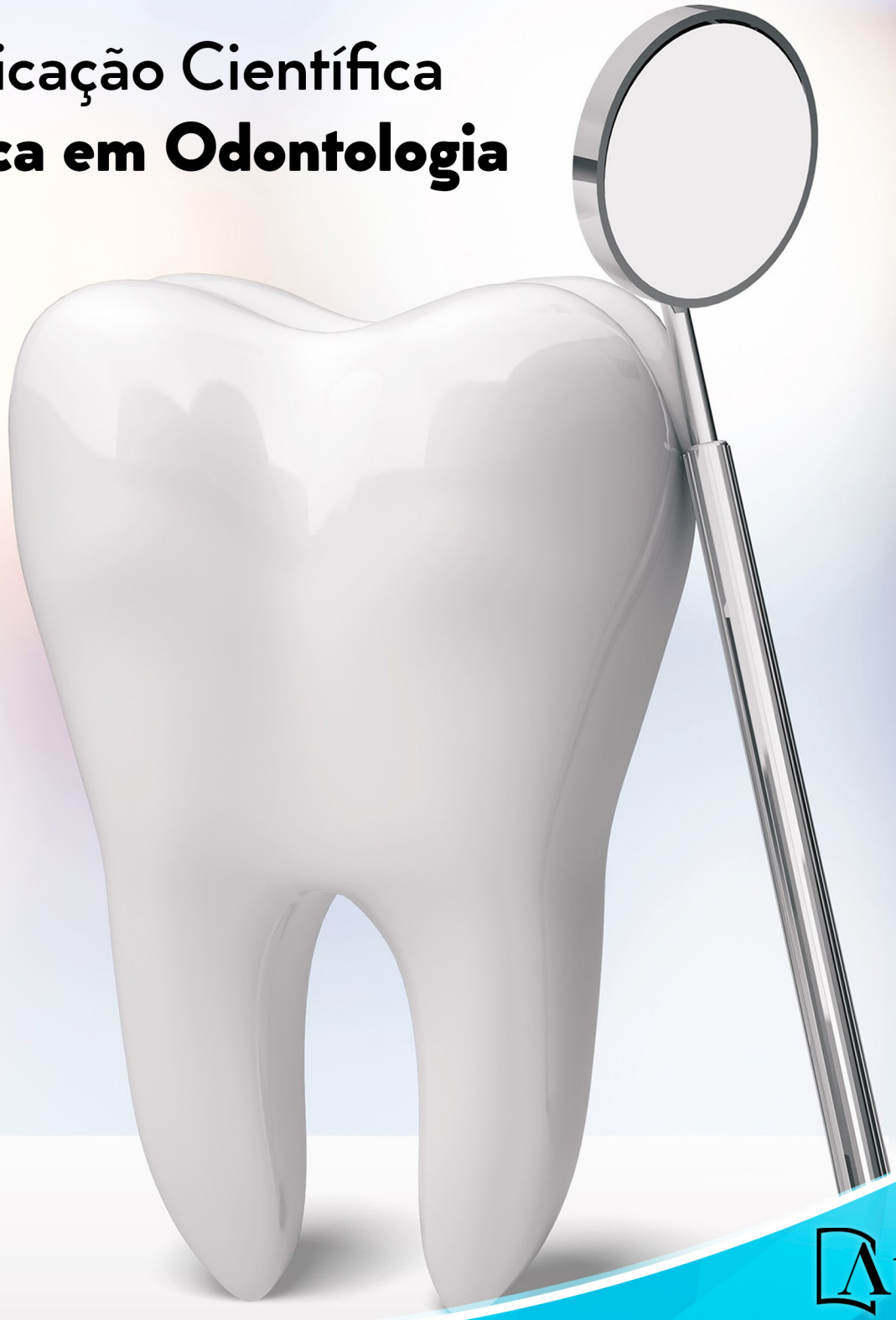
Emanuela Carla dos Santos
(Organizadora)

Comunicação Científica e Técnica em Odontologia



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APRESENTAÇÃO

A Odontologia vem ampliando cada vez mais sua área de atuação dentro do campo da saúde. Hoje aliamos o conhecimento teórico de base às novas tecnologias e técnicas desenvolvidas através de pesquisas para elevar a qualidade e atingir excelência na profissão.

Diante da necessidade de atualização frequente e acesso à informação de qualidade, este E-book, composto por dois volumes, traz conteúdo consistente favorecendo a Comunicação Científica e Técnica em Odontologia.

O compilado de artigos aqui apresentados são de alta relevância para a comunidade científica. Foram desenvolvidos por pesquisadores de várias instituições de peso de nosso país e contemplam as mais variadas áreas, como cirurgia, periodontia, estomatologia, odontologia hospitalar, bem como saúde do trabalhador da Odontologia e também da área da tecnologia e plataformas digitais.

Espero que possam extrair destas páginas conhecimento para reforçar a construção de suas carreiras.

Ótima leitura!

Profª. MSc. Emanuela Carla dos Santos

SUMÁRIO

CAPÍTULO 8

RAPID PROTOCOL OF LLLT IN PATIENTS WITH MIOFASCIAL PAIN AND MOUTH OPENING LIMITATION: PRELIMINARY RESULTS

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ABSTRACT: This study evaluated the preliminary results of a rapid protocol for laser treatment of patients with myofascial pain and mouth opening limitation. The sample was composed of nine patients who were treated with low-level laser therapy using the infrared tip. Two sessions of laser therapy were performed with a 48 hours interval between them. Mouth opening was significantly better immediately after the first session, and when comparing the initial mean to the second session. Regarding spontaneous pain, 44.44% of the patients related complete remission. The rapid treatment protocol was shown to be effective in increasing the mouth opening width in patients with myofascial pain and mouth opening limitation.
KEYWORDS: facial pain; laser therapy; temporomandibular joint disorders.

1 I INTRODUCTION

Temporomandibular disorders (TMD) is composed of a set of signs and symptoms involving the masticatory muscles, temporomandibular joint and orofacial structures. Epidemiological data have shown that 75% of the population present at some point in their life at least one sign of TMD (incoordination of mandibular movements and articular joint noises) and that 33% present at least one symptom (pain in the

orofacial region and in associated structures, limitation of mandibular movements and difficulty in performing orofacial functions) (Leeuw, 2010; Scrivani et al., 2008).

Due to the multifactorial etiology of TMD and the variety of clinical presentations, the treatment of this disorder is extensive and diverse. Among the wide range of TMD treatment modalities, the use of LLLT has achieved great popularity due to its conservative nature. Analgesic, regenerative and anti-inflammatory effects have also been demonstrated in the target tissue (Ahrari et al., 2014).

A large number of studies have attempted to treat TMD signs and symptoms by means of laser therapy, therefore there is a wide variety of irradiation protocols for this disease, but there is no consensus about which would be the ideal one. In addition, the majority of the studies collect in their samples TMD of muscular and articular origin together and have focused on pain relief, with little data on improvement in mandibular functions. Thus, the objective of this preliminary study was to evaluate the effect of a rapid protocol of LLLT on the treatment of mouth opening (MO) and myofascial pain due to muscular origin TMD. The alternative hypothesis was that LLLT would increase the range of mandibular motion in patients with TMD muscular and reduce pain.

2 I METHODS

The patients referred to the Federal University of Santa Maria (UFSM) with complaints of muscle pain were evaluated and diagnosed by the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) and basic anamnesis. The subjects were informed about the research purposes and signed an informed consent form approved by the Research Ethics Committee (Process #74925717.6.0000.5346).

The inclusion criteria were: patients between 18 and 60 years of age, of both sexes, who presented myofascial pain with MO limitation. This condition, recognized by the Axis I of RDC/TMD, is included in Group I of muscular disorders. For patients to be diagnosed with this disease, they had to present a complaint of pain in the mandible, temples, face, preauricular area or within the ears, at rest or during function; Pain on palpation in 3 or more of the 24 sites of face muscles and temporomandibular joint sites, and at least one of these sites had to be on the same side of the complaint; Pain-free MO of less than 40 mm, and during the maximal assisted MO, the passive stretching should be equal or greater than 5 mm.

Exclusion criteria were: disc displacement; acute traumatic injuries; patients who were completely or partially edentulous, including the anterior region, and those undergoing treatment for TMD with other health professionals. Patients undergoing drug therapy for TMD had to discontinue the medication at least 10 days before the study began (washout) and were instructed not to use the medication during the treatment period.

Two trained and calibrated researchers were responsible for diagnostic

assessments in accordance with the RDC-TMD, treatment follow-up and for LLLT application.

The device used for LLLT was Photon Lase III (DMC Equipamentos LTDA, São Carlos, SP, Brazil). The device was reviewed and calibrated by the manufacturer before this study began. Before each treatment, the amount of energy irradiated was checked by the laser sealer (LaserCheck, MMOptics, São Carlos, São Paulo, Brazil), so that all patients in the treatment group received the same amount of radiation. The infrared laser tip (AsGaAl, $\lambda = 808$ nm), 100 mW power, continuous mode and fluency of 80 J/cm^2. The application protocol adopted was 22 seconds per point, with the tip perpendicular to and in contact with the skin, and without moving it. All the points that were sensitive to palpation were irradiated with distance of least 1 cm between each point. The proposed protocol was based on the recommendations of the device manufacturer, a previous research (Pereira et al., 2014) and on the World Association for Laser Therapy Guideline (WALT, 2006). Two sessions of LLLT were performed with a 48 hours interval between them.

The procedures, examinations and evaluation times performed are shown in the flowchart (Figure 1).

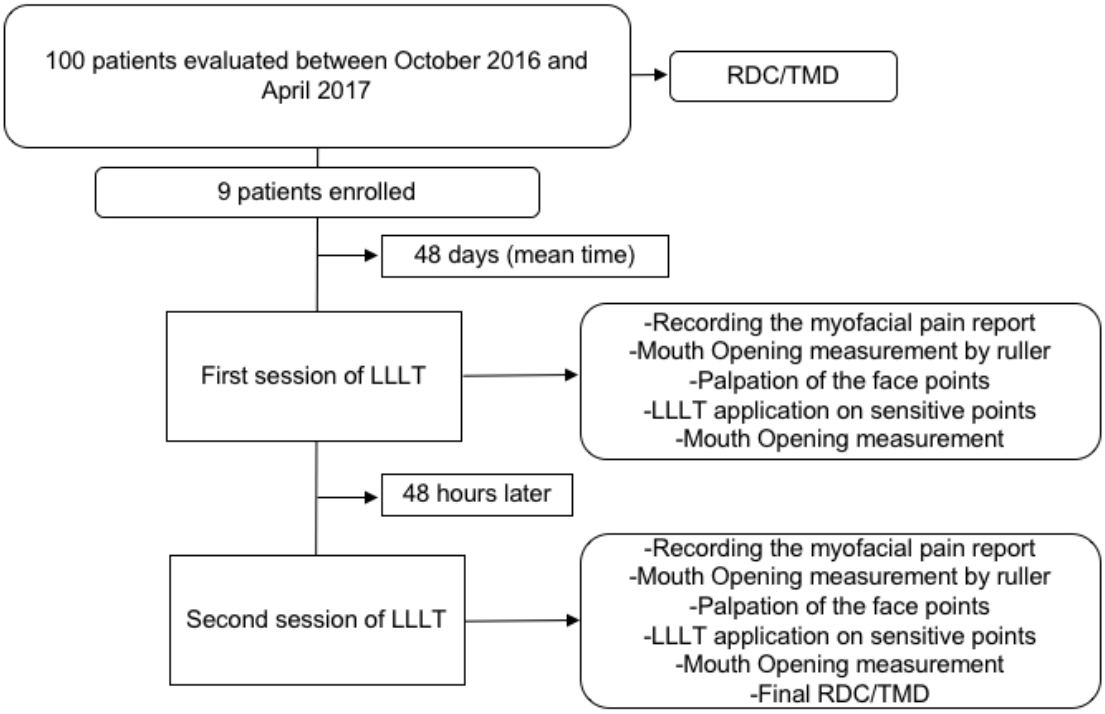

Figure 1 – Procedures, examinations and evaluation times.

The data collected were tabulated and submitted to statistical analysis using the SPSS Software (Statistical Package for the Social Science, version 20, SPSS Inc., Chicago, Illinois, USA).

3 I RESULTS

One hundred patients were evaluated between the dates of October 2016 and April 2017; nine patients fulfilled the inclusion criteria of this preliminary study. All were adults aged between 20 and 60 years, and the mean age was 38.75 years (±6.11) with women representing 77.7% of the participants.

Before the first LLLT session, the mean MO amplitude value was 35.22mm. After laser application, this value increased to 37mm, (p = 0.021*). In the second session, the initial mean value was 37.44mm, and at the end, it was 38.63mm (p = 0.170) (Table 1).

When the mean MO value was evaluated before the first LLLT session and after the second session, there was an increase of 3.41mm in a 48 hours interval, this difference being significant according to the paired t test (p = 0.007*) (Table 2).

The presence of spontaneous pain was evaluated before the first session and before the second session, with a complete reduction of pain in 44.44% of the patients. However, this difference was not significant according to the Chi-square test (p = 0.11) (Table 3).

	Mean (SD)	p	95% Confidence Interval of the Difference
Max. MO before the first session	35.22 (6.09)	**0.021***	-3.20 / -0.35
Max. MO after the first session	37.00 (6.55)		
Max. MO before the second session	37.44 (5.10)	0.170	-3.18 / 0.68
Max. MO after the second session	38.63 (6.69)		

*Indicates statistically significant difference (α= 0.05)

Table 1 – Difference between the mean mouth opening values before and after the first LLLT session and before and after the second LLLT session (Paired t-test).

	Mean (SD)	p	95% Confidence Interval of the Difference
Max. MO before the LLLT	35.22 (6.09)	**0.007***	-5.90 / -1.34
Max. MO after the LLLT	38.63 (6.69)		

Table 2 – Difference between mean mouth opening values before and after the LLLT (Paired t-test).

*Indicates statistically significant difference (α= 0.05)

	N	%	p
Spontaneous pain before the first session	4 / 9	44.44%	0.11
Spontaneous pain before the second session	0 / 9	0%	

Table 3 – Presence of spontaneous myofascial pain before the first LLLT session and before the

second LLLT session (Chi-Square test),

4 I DISCUSSION

The findings of the present study were similar to the results of previous studies with longer treatment protocols. According to the authors, the therapy was considered effective in increasing the range of mandibular movements (Cetiner, 2006; Mazzeto et al., 2010; Ahrari et al., 2014). This increase in MO amplitude may be explained by the ability of the LLLT to increase beta-endorphin levels, thus increasing the pain discharge threshold (Kobayashi and Kubota, 1999).

The infrared laser irradiation at painful palpation points in a single session had the potential to increase the mouth opening width soon after irradiation. In addition, it was found that the patients exposed to the treatment maintained the results obtained for two days; and that after the second application of LLLT the mouth opening width was again increased. According to some studies (Bezuur et al., 1988; Conti et al., 1997), laser has a cumulative effect, which was in agreement with the findings of this study.

Relative to the results obtained and considering the reduction in spontaneous pain, after the second session, all 9 patients reported no pain; a complete remission in 44.4% of the sample. Although this result was of important clinical significance, it was not statistically significant, which may have been due to the small sample size of this preliminary study.

In a recent randomized double-blind clinical trial evaluating the effect of LLLT in women with TMD, it was concluded that both active laser therapy and placebo were able to reduce pain levels (Magri et al., 2017). Also, a systematic review concluded that LLLT therapy was effective in reducing pain in TMD cases and may be a treatment option for patients with an interest in non-invasive therapy (Deepankar Shukla and Muthusekhar, 2015).

The authors suggest that further randomized clinical trials should be conducted with larger samples, contemplating patients of both sexes, and having a control group without treatment and with application of placebo, in addition to a longer follow-up time.

Based on the results of this preliminary study, it can be concluded that the proposed treatment (two sessions of LLLT with a 48 hours interval) was effective in increasing MO amplitude in patients with myofascial pain and MO limitation.

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