

ISSN : 3078-7068



# WFLD 2024 SÃO PAULO BRAZIL, NOV 11-13

THE 18th CONGRESS OF THE WORLD  
FEDERATION FOR LASER DENTISTRY

ABSTRACT BOOK

Promotion

**WFLD**  
The World Federation  
for Laser Dentistry

Organization

**vmcom**



**WFLD 2024**  
**SÃO PAULO**  
**BRAZIL, NOV 11-13**

THE 18th CONGRESS OF THE WORLD  
FEDERATION FOR LASER DENTISTRY

**BE PART OF THE**  
**EVOLUTION**

## Oral Presentation

**Material and methods:** Twenty-eight senescent female rats were distributed in groups: VEH and VEH-aPDT, treated with vehicle, ZOL and ZOL-aPDT, treated with 100 µg/Kg of zoledronate, both treatments every three days over seven weeks. After three weeks, the mandibular first molar was extracted. For the VEH and ZOL groups, no local treatment was performed, while with the VEH-aPDT and ZOL-aPDT groups, photodynamic treatment was carried out at 0, 2, and 4 days after extraction. For aPDT, 500µl of BuTB solution was deposited on the dental extraction site (0.5 mg/ml; 60 s), followed by irradiation with low-level laser (Thera lase, DMC Equipments Ltda; InGaAlP; 660 nm; 35 mW; 74.2 J/cm<sup>2</sup>; 2.1 J; 60 s). After 28 postoperative days, euthanasia was performed. The hemimandibles were processed to: (1) histological analysis of tissue repair; (2) histometric analysis of the percentage of newly formed bone tissue (PNFBT) and percentage of non-vital bone tissue (PNVBT); (3) immunohistochemical analysis for factor nuclear kappa B (NFκB), tumor necrosis factor alpha (TNFα), interleukin 1 beta (1L-1β), transforming growth factor beta 1 (TGFβ1), vascular endothelial growth factor (VEGF), bone morphogenetic protein (BMP) 2 and 7, osteocalcin (OCN) and tartrate-resistant acid phosphatase (TRAP).

**Results:** ZOL-aPDT group showed higher PNFBT, TGFβ1, VEGF, BMP2, BMP7, OCN and lower PNVBT, NFκB, TNFα, 1L-1β compared to the ZOL group. There was no statistically significant difference between VEH and ZOL-aPDT in the following parameters: PNFBT, TGFβ1, BMP2, BMP7 and OCN. The ZOL and ZOL-aPDT groups showed less TRAP-positive cells when compared with VEH and VEH-aPDT.

**Conclusion:** It is concluded that aPDT mediated by BuTB improves the tissue repair process via modulation of inflammation, stimulation of angiogenesis and increase in osteoblastic activity. In addition, it prevented the occurrence of MRONJ.

**Erika da Silva Mello, CÍCERO DA SILVA BEZERRA, LUCIANA TOLEDO COSTA SALVIATO, VANESSA DALAPRIA, ANNA CAROLINA RATO TEMPESTINI HORLIANA, SANDRA KALIL BUSSADORI, ALESSANDRO DEANA** (Brazil)

**Category:** Clinical human studies

**Title:** EFFECTS OF PHOTOBIO-MODULATION CONDITIONING OF OROFACIAL TISSUE IN SURGERY TO REMOVAL OF IMPACTED

MANDIBULAR THIRD MOLARS WITH INFRARED LED: A RANDOMIZED, SHAM-CONTROLLED, DOUBLE-BLIND CLINICAL TRIAL

**Aim:** This study evaluated the effectiveness of LED therapy before surgery to reduce postoperative pain in the tissues affected by the extraction of impacted lower third molars.

**Material and methods:** A randomized, sham-controlled, double-blind clinical trial. Sixty participants were randomly allocated to the photobiomodulation group (PG) and sham group (SG). The PG received infrared LED (24 J, 100 mW at 850 nm) 1 hour before the procedure and was irradiated again 48 hours and 7 days after.

**Results:** On the second day, there was a significant difference between the groups, and day seven of the photobiomodulation group was equal to day 2 of the control group.

**Conclusion:** The present study demonstrated that pre-surgical conditioning of the orofacial tissues involved in impacted lower third molar surgeries, using infrared LED at 850nm, 8J, for 80 seconds, showed a positive result in reducing postoperative pain.

**Fernando Rodrigues Carvalho, Marília Missiano Carvalho, Alyne Simões Gonçalves, Luciane Hiramatsu Azevedo, Patrícia Moreira Freitas** (Brazil)

**Category:** Clinical human studies

**Title:** EFFECT OF PHOTOBIO-MODULATION THERAPY IN PATIENTS WITH REPORTED SPONTANEOUS OROFACIAL PAIN RELATED TO TEMPOROMANDIBULAR DISORDERS – RESULTS OF A DOUBLE-BLIND RANDOMIZED CONTROLLED CLINICAL TRIAL

**Aim:** To determine whether laser therapy is effective in reducing spontaneous facial pain reported by TMD patients after 1, 2, and 3 sessions.

**Material and methods:** This study is part of a double-blind randomized controlled clinical trial that included 153 participants, conducted from October 2016 to March 2020, and presents the results of laser therapy in individuals with complaints of spontaneous orofacial pain related to TMDs. A total of 84 participants with spontaneous pain who completed all three

## Oral Presentation

sessions of the study (1 session/week) were included. Participants were randomized into two groups: placebo (n=39) and laser therapy (n=45). Reports of spontaneous pain were obtained through the question: "Is there facial pain?" from the Portuguese-validated version of the RDC/TMD. Statistical analysis was performed by comparing the number of participants with pain before the first session and after the first, second, and third sessions (placebo or laser therapy). The following parameters were used: GaAlAs diode laser, emitting at 808 nm (DMC, Equipments Ltd), power of 0.1W, power density of 3.57W/cm<sup>2</sup>, energy of 3.0J/point, Energy density of 107.14J/cm<sup>2</sup>, total application time of 19 minutes (30 seconds/point, 19 points per side, total: 38 points). The total energy dose was 4,071.32 J/cm<sup>2</sup> per session and 12,213.96J/cm<sup>2</sup> for the entire treatment. The chi-square test was used to compare the groups after each session, with statistical significance set at  $p \leq 0.05$ .

**Results:** Initially, 39 and 45 participants reported pain in the placebo and laser therapy groups, respectively. After the first session, 23 participants in the placebo group and 16 in the laser therapy group remained in pain ( $p = 0.0318$ ). After the second session, 20 participants in the placebo group and 6 in the laser therapy.

**Conclusion:** Laser therapy proved to be effective in reducing orofacial pain reported by patients with TMD.

**Fernando Rodrigues Carvalho, Marília Missiano Carvalho, Patrícia Moreira Freitas** (Brazil)

**Category:** Clinical human studies

**Title:** LASER THERAPY FOR TEMPOROMANDIBULAR DYSFUNCTION – 6 YEARS FOLLOW UP - CASE REPORT

**Aim:** Report a clinical case of chronic temporomandibular dysfunction, highlighting the photobiomodulation therapy (PBMT) protocol and it is handling through 6 years.

**Material and methods:** W.S., 52-year-old women, living with temporomandibular dysfunction went to LELO already using interocclusal splint, but still feeling pain at the lateral of the face, neck and nape. She used to use analgesics, anti-inflammatories or muscle relaxants daily, alone or combined, for pain relief. After the application of the Research Diagnostic Criteria for TMD

(RDC/TMD), chronic myalgia without emotional compromise was diagnosed and the PBMT was the proposed treatment. The irradiation protocol included the temporomandibular articulation bilaterally and the following muscles: Extraoral: Masseter, temporal, sternocleidomastoid; Intraoral: tendon of temporal, medial pterygoid. 10 sessions were realized, one sessions per week with diode laser GaAlAs (Therapy EC, DMC) emitting 808nm with power density 1.02 W/cm<sup>2</sup>; energy density of 30.61J/cm<sup>2</sup>; total application time of 1260 seconds (30 seconds per point, 21 each side, total of 42 points). The total energy dose was 1,285.62 J/cm<sup>2</sup> per section and 12,856.20 J/cm<sup>2</sup> when considered the whole treatment.

**Results:** After the third session, the pain stopped, and the patient did not need to use any painkillers. Follow-up: The treatment was extended for 10 more sessions, one session per week, and only the pain points identified by the RDC/TMD were irradiated. Afterward, the sessions were conducted every fifteen days, and only the pain points were irradiated. The dosimetry parameters used remained the same throughout the entire treatment. At the end of this period, the patient continued under follow-up and did not experience any pain.

**Conclusion:** PBMT proved to be effective in controlling temporomandibular pain at the beginning and throughout the 6-year follow-up.

**Frederic Cuisinier** (France)

**Category:** Preclinical

**Title:** PHOTOBIO-MODULATION IN CAUDAL FIN REGENERATION

**Aim:** Validation of a new animal model to study photobiomodulation

**Material and methods:** Caudal fin of zebrafish were amputated and photobiomodulation was performed with 810nm laser, UV light. Control was w/o light.

**Results:** This study showed that our experimental conditions of laser irradiation had benefits and can be considered as regenerative stimulator for the amputated zebrafish caudal fin

**Conclusion:** Laser can be suggested to have great regenerative capacity in the zebrafish caudal fin.