



## APPLICABILITY OF PHOTOTHERAPY IN TIBIA BONE HEALING *IN VIVO*- PRELIMINARY STUDY

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**Background, Motivation and Objective.** The principle of the use of low-level laser therapy is based by cellular photobiomodulation-PBM, promoting increased cell proliferation and accelerating tissue repair. The process of bone consolidation may be influenced by nutrition, blood supply, age, metabolism and physical agents. The objective of this preliminary study was to evaluate the effects of PBM on tibial consolidation in patients in the immediate postoperative period.

**Methods.** Participated in these preliminary randomized controlled trial study seven volunteers with tibial bone-fractured and submitted to surgical procedure (Research Ethical Committee-#010419/2016). The volunteers were randomly divided into: Control Group (CG; n=2; Cinesiotherapy-CS) and Treated Group (TG; n= 5; CS + PBM). The TG received infrared laser (808 nm, Recover Laser®, MMOptics; 3 mm<sup>2</sup> spot size, 100 mW; 9 J, 90 s/point in 4 points at the bone-fractured site). For both groups were performed uninterrupted sessions 1<sup>st</sup> after surgery to 7<sup>th</sup> d, repeated at the 14<sup>th</sup> and 21<sup>st</sup> d. The same-trained physiotherapy performed all procedures. The patients were submitted to radiographs before and immediately after surgery and the final period, in the images were measured and compared % of the fractured areas by means of the software Image J.

**Results.** The results indicate that the laser presents great osteoinduction potential of progenitor cells to the fractured site. The measurement of fractured areas demonstrated acceleration of bone formation on laser treated areas in this preliminary study. The initial (7<sup>th</sup> d) and final (21<sup>st</sup> d) areas values were respectively in CG 181.61 and 152.79 mm<sup>2</sup> and TG 135.46 and 130.93 mm<sup>2</sup>. The area reduction was 15.8% in CG and 3.3% in TG (p> 0.05%).

**Discussion and Conclusions.** It was possible to conclude in this preliminary study that laser PBM associated with CS promoted effective osteoinduction and benefices to patients, with earlier return to their activities.

**Keywords:** bone fracture; Laser therapy; physiotherapy; photobiomodulation.