

THE EFFECT OF PHOTOBIOMODULATION THERAPY, COMBINED WITH CARBON MATERIAL IMPREGNATED WITH SILVER NANOPARTICLES, ON INFECTION CONTROL AND REPAIR IN A BONE INJURY MODEL.

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ABSTRACT

Osteomolecular surgeries are common worldwide, causing a socioeconomic impact on the country. The use of external agents such as composite biomaterials is crucial to expedite bone repair and control potential infections, thus advancing patient rehabilitation. The study of photobiomodulation therapy associated with the use of non-scarce carbon biomaterials is significant. **OBJECTIVE:** To evaluate the effect of Photobiomodulation Therapy associated with carbon material impregnated with silver nanoparticles on bacterial control, cell growth, and the bone repair process in an experimental model of bone injury in rat tibia. **MATERIALS AND METHODS:** Wistar rats were randomly distributed into groups: G1 (healthy rats); BF (bone defect); BF NT (BF without treatment); BF+C (BF with carbon material); BF+CNP (BF with carbon material associated with silver nanoparticles) BF+CNP+PBM (BF with carbon material associated with silver nanoparticles and photobiomodulation); Local PBM (808nm photobiomodulation, 100mW, 6J, 60s). The animals will be euthanized at 30-60-90 days after the injury. Blood and tibia samples will be collected for biochemical (alkaline and acid phosphatase) and morphological (histological) analyses. Functional study will include biomechanical tests (shear, resistance, and flexibility).

Keywords: Photobiomodulation Therapy (PBM), Carbon, Silver nanoparticles, Staphylococcus aureus, Mechanical properties.

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