

PROTOCOLOS DE INVESTIGACIÓN - MEDICINA

PREOPERATIVE PHOTOBIMODULATION IN TOTAL HIP ARTHROPLASTY: RANDOMIZED, DOUBLE-BLIND, CONTROLLED CLINICAL TRIAL

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Population aging is associated with systemic changes such as osteoporosis and sarcopenia, which impair balance and bone quality, increasing the risk of falls and consequent hip fractures. Among these, femoral neck fractures show a rising incidence from the fifth decade of life, with total hip arthroplasty (THA) being the preferred treatment when osteosynthesis is not indicated. In Brazil, thousands of THAs are performed annually, and postoperative pain remains a significant clinical challenge. This randomized, double-blind clinical trial will assess the impact of preoperative photobiomodulation (PBM) on pain in patients

with femoral neck fractures undergoing THA. A total of 144 patients (72 per group) will be enrolled and equally allocated into a control group—receiving the conventional rehabilitation protocol with physiotherapy and analgesia—and an intervention group, which will receive the same protocol plus PBM 60 minutes before surgery. PBM will be applied using the e-Light® device (HTM Eletrônica, Brazil) to the anterior and lateral regions of the operated hip, following a standardized protocol. All surgical procedures will be performed by a single surgeon using a cementless THA technique via the anterior approach. Pain intensity will be measured with the Visual Analogue Scale (VAS) at rest and during active movement from the immediate postoperative period up to 36 hours. Secondary outcomes will include analgesic consumption, functional performance (Timed Up and Go test), length of hospital stay, patient satisfaction, and adverse event records. It is expected that preoperative PBM, combining red and near-infrared light, will reduce acute pain, promote early functional recovery, and enhance comfort and safety during rehabilitation in this patient population.

Palavras-chave: photobiomodulation; total hip arthroplasty; femoral neck fracture.