

Photobiomodulation modulates IL-6 and TNF- α expression during the compensatory hypertrophy process in skeletal muscle

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Skeletal muscle is a tissue with high adaptive capacity altering its characteristics to meet its diverse functional demands. Compensatory hypertrophy (CH) occurs due to excessive mechanical load on a muscle, promoting an increase in the size of muscle fibers. Photobiomodulation (PBM) has demonstrated beneficial effects on muscle tissue during CH. The aim of this study was to evaluate the effect of PBM on the inflammatory cytokines interleukin-6 (IL-6) and tumor necrosis factor alpha (TNF- α) during the process of CH. Wistar rats were divided into three groups: control group (n=5), hypertrophy (H) group (n = 10) and Hypertrophy + PBM group (n = 10). CH was induced through the ablation of synergist muscles of the plantaris muscle. The preserved plantaris muscle below the removed muscles was submitted to excessive functional load. PBM was performed with low-level laser (AsGaAl, $\lambda = 780$ nm; 40 mW; energy density: 10 J/cm²; 10 seconds on each point, 8 points; 3.2 J). Animals were euthanized after seven and 14 days. The plantaris muscles were removed and sent for analysis of the gene expression of IL-6 and TNF- α using qPCR. The gene expression results demonstrated an increase in IL-6 in the H+PBM group in comparison to the H group at 14 days as well as an increase in TNF- α in the H+PBM group in comparison to the H group at seven days. Based on findings in the present study, it is concluded that PBM was able to modulate pro-inflammatory cytokines that are essential for the compensatory hypertrophy process.

Biography

Andréia Martinelli de Siqueira Araujo was graduated in physical therapy by the Nove de Julho University. During the undergraduate period, she participated in a scientific initiation project which allowed her to know better the research. After she obtained her Master Degree in Rehabilitation Sciences Post Graduate Program at Nove de Julho University and currently she is a Ph.D. student in the same Post Graduate program. The main objective of her research area is to evaluate the plasticity of the skeletal muscle. In her spare time, she likes to sing and play the guitar. She also likes to spend time having fun with her family.