

INVESTIGACIÓN - MEDICINA

EFFECT OF PHOTOBIMODULATION ON THE CYTOTOXICITY AND CELL DEATH MECHANISMS IN C2C12 CELLS EXPOSED TO JUVENILE AND ADULT BOTHROPS ALTERNATUS VENOMS.

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Bothrops snakes are of great medical and epidemiological importance, and their bites cause both systemic and serious local effects on their victims. It is also known that there are differences in the composition of the venoms of young and adult snakes, which can lead to differences in the evolution of clinical manifestations. Photobiomodulation (PBM) has been shown to be an effective adjuvant therapy to serum therapy to reduce the local effects induced by bothropic snake venom. This study evaluated the effect of PBM on C2C12 myoblast cells after the action of Bothrops alternatus snake venom (BaV) in its

juvenile (BaJV) and adult (BaAV) stages. C2C12 cells received VBaJ or VBaA (50 µg/mL), or only culture medium (control), and were immediately treated with PBM. Treatment was performed using a low-level laser (660 nm wavelength, 4 J/cm², 100 mW, 0.33 W/cm², 40 seconds). Cytotoxicity, apoptosis, and necrosis were assessed 3 hours after venom exposure using LDH assays and flow cytometry to measure fluorescence emission for annexin V (apoptosis) and 7-AAD (necrosis). The results demonstrated that both venoms significantly increased cytotoxicity and induced apoptosis. PBM treatment reduced BaAV-induced apoptosis and necrosis but had no effect on BaJV-induced apoptosis, necrosis, or cytotoxicity. These findings demonstrate that both juvenile and adult venoms affect C2C12 cells, their effects differ in magnitude. PBM treatment shows protective effect against *B. alternatus* venom across different developmental stages, suggesting its therapeutical utility in mitigating venom-induced cytotoxicity.

Palavras-chave: keywords: photobiomodulation (pbm); cytotoxicity; *Bothrops alternatus*.