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Proceedings Article

Low level laser therapy for traumatic brain injury

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Proc. SPIE 7552, Mechanisms for Low-Light Therapy V, 755206 (February 25, 2010); doi:10.1117/12.841014

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Mechanisms for Low-Light Therapy V
Michael R. Hamblin; Ronald W. Waynant; Juanita Anders
San Francisco, California | January 23, 2010

Abstract References

abstract

Low level laser (or light) therapy (LLLT) has been clinically applied for many indications in medicine that require the following processes: protection from cell and tissue death, stimulation of healing and repair of injuries, and reduction of pain, swelling and inflammation. One area that is attracting growing interest is the use of transcranial LLLT to treat stroke and traumatic brain injury (TBI). The fact that near-infrared light can penetrate into the brain would allow non-invasive treatment to be carried out with a low likelihood of treatment-related adverse events. LLLT may have beneficial effects in the acute treatment of brain damage injury by increasing respiration in the mitochondria, causing activation of transcription factors, reducing key inflammatory mediators, and inhibiting apoptosis. We tested LLLT in a mouse model of TBI produced by a controlled weight drop onto the skull. Mice received a single treatment with 660-nm, 810-nm or 980-nm laser (36 J/cm²) four hours post-injury and were followed up by neurological performance testing for 4 weeks. Mice with moderate to severe TBI treated with 660-nm and 810-nm laser had a significant improvement in neurological score over the course of the follow-up and histological examination of the brains at sacrifice revealed less lesion area compared to untreated controls. Further studies are underway.

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Topics

Low-intensity laser therapy ; Traumatic brain injury ; Injuries ; Lasers ; Brain ; Wound healing ; Medicine ; Near infrared ; Skull ; Tissues

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