

Effects of LLLT on ATP/ADP Contents of Rat Brain Tissue

Effects of near-infra-red laser irradiation on adenosine triphosphate and adenosine diphosphate contents of rat brain tissue. Neuroscience letters. 2002; 323 (3): 207-210.

Mochizuki O N, Kataoka Y, Cui Y et al.

Low-power, near-infra-red laser irradiation has been used to relieve patients from various kinds of pain, though the precise mechanisms of such biological actions of the laser have not yet been resolved. To investigate the cellular mechanisms by near-infra-red laser on the nervous system, we examined the effect of 830-nm laser irradiation on the energy metabolism of the rat brain. The diode laser was applied for 15 min with an irradiance of 4.8 W/cm². Tissue adenosine triphosphate (ATP) content of the irradiated area in the cerebral cortex was 19% higher than that of the non-treated area, whereas the adenosine diphosphate (ADP) content showed no significant difference.

Laser irradiation at another wavelength (652 nm) had no effect on either ATP or ADP contents. The temperature of the tissue was increased by 4.4-4.7 degrees C during the irradiation of both wavelengths. These results suggest that the increase in tissue ATP content did not result from the thermal effect, but from a specific effect of the laser operated at the 830-nm wavelength