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Comparison Between Single-Diode Low-Level Laser Therapy (LLLT) and LED Multi-Diode (Cluster) Therapy (LEDT) Applications Before High-Intensity Exercise

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Abstract

Background Data and Objective: There is anecdotal evidence that low-level laser therapy (LLLT) may affect the development of muscular fatigue, minor muscle damage, and recovery after heavy exercises. Although manufacturers claim that cluster probes (LEDT) maybe more effective than single-diode lasers in clinical settings, there is a lack of head-to-head comparisons in controlled trials. This study was designed to compare the effect of single-diode LLLT and cluster LEDT before heavy exercise. ***Materials and Methods:*** This was a randomized, placebo-controlled, double-blind cross-over study. Young male volleyball players (n = 8) were enrolled and asked to perform three Wingate cycle tests after 4 × 30 sec LLLT or LEDT pretreatment of the rectus femoris muscle with either (1) an active LEDT cluster-probe (660/850 nm, 10/30 mW), (2) a placebo cluster-probe with no output, and (3) a single-diode 810-nm 200-mW laser. ***Results:*** The active LEDT group had significantly decreased post-exercise creatine kinase (CK) levels (−18.88 ± 41.48 U/L), compared to the placebo cluster group (26.88 ± 15.18 U/L) ($p < 0.05$) and the active single-diode laser group (43.38 ± 32.90 U/L) ($p < 0.01$). None of the pre-exercise LLLT or LEDT protocols enhanced performance on the Wingate tests or reduced post-exercise blood lactate levels. However, a non-significant tendency toward lower post-exercise blood lactate levels in the treated groups should be explored further. ***Conclusion:*** In this experimental set-up, only the active LEDT probe decreased post-exercise CK levels after the Wingate cycle test. Neither performance nor blood lactate levels were significantly affected by this protocol of pre-exercise LEDT or LLLT.