

The HSP expression of passive repetitive plyometric trained skeletal muscle

許政成

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摘要

Abstract

This study aims to understand the effect of ten-week passive repetitive plyometric (PRP) training on human skeletal muscle and the application of PRP training for performance. Vastus lateralis of nine candidates were aspirated before (pre) and after (post) PRP training. Histochemical approaches with regular hematoxyline-eosin (HE) and Mallory's phosphotungstic acid hematoxylin (PTAH) stains were used to demonstrate the changes of muscle fibers. Immunohistochemical studies with heat shock protein (anti-hsp72, Stressgen, Canada) were employed to display cellular activities. Each set of slides was quantitatively analyzed by using a modified morphometric method (Russ and Dehoff, 1999) on a Nikon ECLIPSE 80i microscope, equipped with an Evolution VF COOLED color video camera, and the Image-Pro Plus software (5.0 for Win; Media Cybernetics, USA). Finally, hsp72 mRNAs of both pre-PRP and post-PRP specimens were amplified through RT-PCR. Signal intensities were read by a densitometer and analyzed through the SPSS (11.0 for Win) statistically. Post-PRP muscle cells demonstrated hypertrophic change with increased cellular content and a narrowed inter-cellular space according to both HE and PTAH profiles. Post-PRP cellular hsp72 proteins were higher by up to five percent, as measured by a gray-scale reading. Further, after a training period of 10 weeks, hsp72 mRNA expression was several times higher.