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Expression of TNF-α in rat during exercise-induced muscle injury and repair process

Zuo Qun

Shanghai University of Sport, China

Abstract

Objective: The purpose of this study was to observe the expression of muscle tumor necrosis factor-α (TNF–α) in rat during exercise-induced muscle injury and repair.

Methods: The gastrocnemius of 8-week-SD rats were fetched at 0h, 6h, 12h, 1d, 2d, 3d, 1w, 2w after one bout of downhill treadmill running(90min, -16m/min speed and -16°slope) for HE staining. Serum and muscle TNF–α expression was analyzed by ELISA and immunohistochemistry staining. Results: Skeletal muscle had massive inflammatory cells accumulation and infusion 3d after exercise, then gradually attenuated and vanished at 2w. Serum TNF–α contents showed minor changes while the expression of TNF–α in muscle elevated significantly throughout the whole process, reaching peaks at 0h and 3d respectively. The positive staining of TNF-a appeared not just in inflammatory cells but also in myofiber endochylema.

Conclusion: The higher expression of TNF–α during muscle injury and repair course suggested multiple roles of TNF-a in inflammatory and regeneration of skeletal muscle.