Comparison of Effects of HMB or Leucine Supplementation on Skeletal Muscle Recovery at 3 Weeks After Injury

Takuya Nakamura, Takanaga Shirai, Yuya Ota, Tohru Takemasa*

University of Tsukuba, Ibaraki, Japan

*Corresponding author: takamasa.tohru.gm@u.tsukuba.ac.jp

Abstract

Introduction: Muscle injury is one of the most traumas in sports. β-Hydroxy β-Methylbutyrate (HMB) are often used to promote muscle recovery. HMB is metabolite of Leucine. HMB and Leucine have been reported similar effects such as promoting muscle hypertrophy and suppressing muscle atrophy. However, long-term effects of HMB and L-Leucine on recovery after muscle injury had not been compared. The purpose of this study is to compare the effects of each supplements on muscle regeneration at 3 weeks after injury.

Methods: 8 weeks of age male ICR mice were randomly divided into 3 groups of 6 animals after 1week acclimation period. HMB (500 mg/kg/day) or L-Leucine (500 mg/kg/day) was orally administrated. All mice were anesthetized with isoflurane, then 50 µl of 1.2 % BaCl2 solution was injected into tibialis anterior (TA) muscle. BaCl2 solution induces extensive injury and subsegment skeletal muscle regeneration.

Results: 3 weeks after injury, HMB increased regenerating fiber Cross Sectional Area (CSA) compared to control and L-Leucine. L-Leucine tended to suppress fibrosis area compared to control.

Conclusions: We suggested that HMB is effective for regenerating muscle fibers and L-Leucine is effective for suppressing fibrosis at 3 weeks after injury.

Keywords: β-Hydroxy β-Methylbutyrate (HMB), L-Leucine, Injury, Regeneration, Fibrosis