Effects of uphill and downhill walking on the degree of muscle pain of the lower extremities after exercise

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Purpose: The purpose of this study was to clarify the effect of uphill and downhill walking on the degree of muscle soreness after exercise. Methods: The subjects were six healthy Japanese males. The subjects walked on treadmills for 30 minutes (Walking speed: 3.0km/h, the weight of the backpack: 15% of body weight). Exercise conditions were the uphill (slope: 10%) and downhill conditions (slope: -10%). Measurement items were Fatigue and muscle soreness (Visual Analog Scale). Fatigue and muscle soreness of the lower extremities were measured before exercise and after exercise. Results and Discussion: Muscle soreness in the uphill and downhill-conditions appeared immediately after the end of the exercises. Muscle soreness in the uphill-condition disappeared after one day of exercise. On the other hand, muscle soreness in the downhill-condition disappeared after two days of exercise. Moreover, the degree of muscle soreness immediately after exercise in the downhill-condition was significantly higher than in the uphill-condition (p<0.05). From these results one can say that it is necessary to ensure for more rest after downhill walking than for the rest after uphill walking. Conclusion: Loss of muscle soreness during downhill walking was delayed as compared to uphill walking. Key words: muscle soreness, eccentric contraction, downhill walking

Differences in delayed and immediate onset muscle soreness and damage induced by eccentric exercise and a full-marathon

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Purpose: We researched the differences in characteristics between delayed onset muscle soreness (DOMS) and immediate onset muscle soreness (IOMS) in specific muscle groups after eccentric exercise and a full-marathon. Methods: In the Experiment 1, we measured DOMS in 9 young males who performed high intensity eccentric exercise specific to the non-dominant upper extremity flexor muscles. In Experiment 2, we measured IOMS in 19 young males and 3 females who participated in a full-marathon. In both experiments, the visual analog scale (VAS), upper arm or femoral circumference (CIR), serum creatine kinase (CK), and lactate dehydrogenase (LDH) levels were measured before exercise, immediately after exercise, and at 1 to 4 days after exercise. Results: In Experiment 1, VAS peaked on day 2, CIR increased immediately and then temporarily decreased on day 1; however, it then increased until day 4. From days 3 to 4, CK and LDH levels increased. In Experiment 2, VAS increased immediately after a full-marathon and peaked on day 1. Circumference immediately decreased after that; however, it recovered by day 2. Serum CK level peaked on day 1 and LDH level increased immediately after that and both levels decreased by day 3. Conclusion: We suggest that muscle soreness and damage after a full-marathon appeared earlier compared with that after eccentric exercise; however, swelling did not occur after a full-marathon. Key words: muscle soreness, full-marathon, eccentric exercise