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Energy Expenditure of Resistance Exercise Using Body Weight with Slow Movement

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Background: Few studies have investigated the energy expenditure (EE) of resistance exercises using body weight with slow movement, the purpose of this study was to evaluate EE of resistance exercise using body weight with slow movement.

Methods: Eight young men aged 22–27 years performed 6 resistance exercises. The exercises consisted of Squat, Push-up, Lunge, Heel-raise, Hip-lift and Crunch. Both the concentric phase and eccentric phase were set to 3 seconds (6 seconds with one iteration), and the subjects adjusted the rhythm with the sound of a metronome. A total of 10 repetitions was set as 1 set (1 minute in total), rest between sets was 30 seconds, and a total of 3 sets were performed. After the end of the third set, the subject rested for 30 seconds, and carried out the next event, total time was 26 mins 30 seconds. For measurement of energy expenditure (EE), heart rate (HR), RPE and lactate (La) during resistance exercise, we used a face mask and expiratory gas analyzer, EE was calculated from Weir equation.

Result: Figure-1 shows mean EE while the subjects performed resistance exercise. With regard to the type of resistance exercise, EE of Squat, Push-up and Lunge, which is the multi-joint nature of the exercises and therefore the stimulation of large and multiple muscles, were higher than the other three exercises. Physiological responses were as follows, EE; 92.6 ± 16.0 kcal, RER; 0.98 ± 0.03, HR; 98.8 ± 14.0 bpm, RPE; 13.5 ± 2.3, La; 3.3 ± 1.0 mM.

Conclusion: The EE observed in this study for resistance exercise using body weight with slow movement was 92.6 ± 16.0 kcal/min in average.

Key words: body weight maintenance, muscle-strengthening activity, muscle fitness

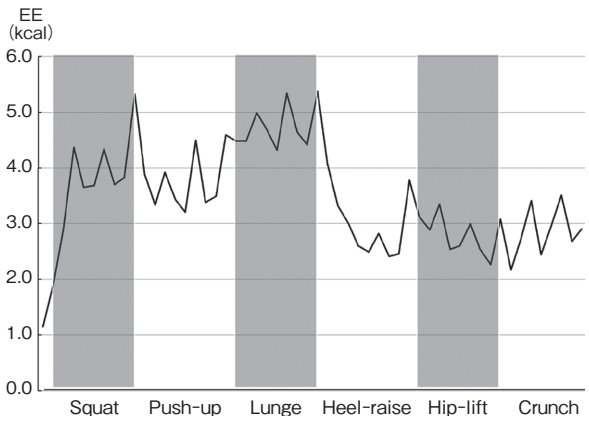

Figure-1

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