

Assessment of maximal cardiorespiratory performance and muscle power in the Italian Olympic judoka.

Sbriccoli P, Bazzucchi I, Di Mario A, Marzattinocci G, Felici F.

Applied Physiology Laboratory, Department of Human Movement and Sport Sciences, University Institute for Movement Sciences, Rome, Italy.

The main purposes of this study were to describe the cardiorespiratory fitness and lower limbs maximal muscle power of a selected group of Olympic Italian male (M) and female (F) judokas. Eleven subjects (6 M, 5 F) underwent 3 different tests. The VO_2max and ventilatory threshold (VT; V-slope method) were assessed during a graded maximal treadmill test. Lower limbs muscle peak power (PP) and mean power (MP) were determined during a 30-second Wingate test (WIN). Post-WIN blood lactate peak was also measured. Subjects were tested also during a 5-minute combat test (CT), during which blood lactate and heart rate (HR) were monitored. VO_2max (mean \pm SD) was 47.3 ± 10.9 and 52.9 ± 4.4 ml \times kg⁻¹ \times min⁻¹ for M and F judokas, respectively. The VT corresponded to 80.8% (M) and 86.5% (F) of VO_2max . Both PP and MP, measured during the WIN, were significantly higher ($p < 0.05$) in M than in F judokas (PP: 12.1 ± 2.4 vs. 9.5 ± 1.1 W \times kg⁻¹); MP: 5.4 ± 1.1 W \times kg⁻¹; F: 4.3 ± 0.5 W \times kg⁻¹). Post WIN blood lactate peak was 6.9 ± 2.8 mmol \times l⁻¹ and 6.1 ± 1.8 mmol \times l⁻¹ for M and F judokas, respectively (not significant). During the CT blood lactate peak was 9.9 ± 3.0 mmol \times l⁻¹ (M) and 9.2 ± 2.0 mmol \times l⁻¹ (F); these values being significantly higher than those obtained after the WIN ($p < 0.05$). In conclusion, Italian Olympic judokas showed high levels of muscle power but accompanied by a moderate engagement of the aerobic metabolic pathway, which is well in accordance with the characteristics of judo. Having these results in top-level athletes may represent a useful contribution to the work of coaches and trainers in optimizing training programs for the achievement of the best performance of the judoka.