STRENGTH TRAINING AND WHEELCHAIR TENNIS: A LONGITUDINAL STUDY

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Introduction
The human body benefits of the ability to adapt as a result of specific muscle stimulation (Jones et al. 1989, Mujika and Padilla 2001). The strength is maintained for about 4 weeks of detraining in athletes accustomed to a heavy training loads, undergoes a significant decline in shorter times in beginners athletes (Mujika and Padilla 2001). To investigate the variation of isometric maximal voluntary contraction (MVC) without (NR) and with racquets (R, Figure 1) in relation to specific weightlifting training on the trunk and upper limb muscles in a group of wheelchair tennis athletes.

Methods
Twelve wheelchair tennis (WT) athletes, with different levels of disability (Spinal Cord Injury complete and incomplete, Caudal Regression Syndrome, Multiple Sclerosis), were studied. The subjects were divided into two groups of six athletes: 1) the experimental group (EG, 43±4 years, 73±18 kg weight, 176±10 cm height) in addiction of tennis training on field, following eight weeks (WKs) of weightlifting training; 2) the control group (CG, 43±14 years, 69±19 kg weight, 169±17 cm height) do not change their tennis training habits. All groups were evaluated before and after two months of training to verify the effects of weightlifting and tennis training. The isometric MVC was measured using the TESYS system (Total Evaluation System, Globus, Treviso, Italy, Figure 2) which was connected to a load cell (ESYCC300, Globus Italy, Treviso, Italy).

Results
Data analysis (Wilcoxon test) showed a significant increase in MVC in EG in the NR (p<0.05, +16%) and R conditions (p<0.05, +11%). No significant changes were observed in CG (Figure 3).

Conclusion
The weightlifting training increases the isometric MVC of NR and R, while playing only tennis is sufficient to maintain strength performance. The results highlight that training with overloads can significantly contribute to improve physical muscle efficiency in wheelchair tennis athletes.

References
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