ABSTRACT

This bachelor's thesis focuses on the effect of a force compensation plan on the performance of an elite road cyclist. The goal was to diagnose the proband's current strength disposition, apply a 16-week long intervention program and monitor its effect on the cyclist's performance. The proband was a 28-year-old man, 170 cm tall and 64.7 kg in weight, with right-limb dominance. She has been cycling since she was 13 years old and regularly trains approximately 25 hours a week. The proband underwent input, control and output measurements during the intervention. This always included a body composition analysis using the electrical bioimpedance method, followed by a kinesiological analysis using aspect and palpation, and a diagnosis of shortened muscles. Another measurement was muscle strength tests on the Cybex isokinetic trainer, where the strength of the knee extensors and flexors was measured. Furthermore, the explosive strength of the lower limbs was measured on Kistler pressure plates. Finally, specific performance tests of maximum performance for 10 s and 40 min on a bicycle ergometer were included. The intervention led to the disappearance of most muscle imbalances and shortened muscles. Muscle strength increased in both the dominant and non-dominant lower limb, but primarily the ratio of hamstring to quadriceps strength leveled and increased. Maximum power for 10 s increased by an average of 13.6% and maximum power for 40 min increased by an average of 6.3%. A power compensation plan had a positive effect on the performance of a top road cyclist. There was an improvement in muscle strength, equalization of muscle imbalances and an increase in maximum cycling performance both for very short and very long intervals. This work confirms that strength training can be beneficial for improving the performance and training capacities of road cyclists.