

Long- and short term training results through mechanical and Electro Muscle Stimulation (EMS) based on strength parameters.

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Objective

The aim of the study was to compare classical methods of strength training to the dynamic full body EMS training in regards to strength and speed.

Methodology

80 sport students were assigned in equal numbers to training groups, some carried out classical training programmes such as hypertrophy, maximum strength, speed and endurance exercises, others used the modern training methods of full body EMS and vibration, a 3rd group used programmes that combined either full body EMS and hypertrophy or vibration and hypertrophy. Training groups using classical methods worked on machines for leg extensions and leg bending muscles and working with different weights (30- 90%). The EMS groups did lunges and squats without additional weights (60% intensity). The training took place twice a week for 4 weeks. Separate output and input tests were undertaken before and after the training as well as after a regeneration phase of two weeks. The dynamic of the performance was measured (strength x speed) using a 40 % and 60 % additional weight loading and varying angles.

Results

There was a significant increase in maximum strength for all types of trainings. The best results were reached by the hypertrophy group with a 16% increase of maximal strength, followed by the EMS group with 9-10% increase. However, only the EMS group achieved a significant increase in speed. The measured speed performance improved by about 30 %, which was considerably better than the results in the classic training groups that only increased by 16-18%. The proposed reason for these results is that EMS training directly targets the fast muscle fibers. The mixed training programmes such as the combined EMS and hypertrophy training showed the typical effects as would be expected from the combined training with both stimuli (7% increase of maximal strength and 12% increase of performance).

Conclusion

Dynamic full body EMS training with XBody devices proved to be a highly effective means of increasing strength and speed as compared to other training methods. Full body

EMS training was the only training method that succeeded in improving the speed factor within the overall performance. In addition, the results achieved by this training methodology open up new possibilities for frequency and duration of training. The regular use of EMS training in combination with dynamic movement is a promising combination for improved strength, endurance and speed work.