10th Annual Congress of the European College of Sport Science, Belgrade, Serbia, 2005

Increase of the specific rapidity in the Tae-Kwon-Do through a contrast method

Villani R.[1,2,3], Ruggieri F.[1], Tomasso A.[1,3], Distaso M.[1,3]

[1] T.M.P.A. Combat Sport, Facoltà di Scienze Motorie, Università di Cassino; [2] Istituto Universitario Scienze Motorie Roma, [3] Study and Research Center Combat Sport – CSEN Italia

Introduction

The execution rapidity of kick techniques is a fundamental skill to excel in Tae-Kwon-Do. In fact these offensive actions are the most important in this sport, and their fast execution is essential to cut down the defence and counter-attack possibilities (chances) of the opponent. Unfortunately the action rapidity of acyclic movements is a hard training skill, especially in evolved athletes in which techniques are well consolidated. Fig. 1
SoK test (modif.)
Many authors studied for a long time systems that would permit to obviate this problem and exceed the rapidity barrier, but it was Prof. J. V. Verchoshanskij that gave a major contribution in this field. Among the methods studied by Prof. J. V. Verchoshanskij, one of the most interesting is the stimulation method in which a "rapidity" exercise comes after an "intensive strength load". To offer our contribution to the researches carried out in this field, we (have) started an experimentation with the aim of estimating the effects of a contrast training method based on the principal of Verchoshanskij stimulation to increase the rapidity of execution of the leg techniques of Tae-Kwon-Do.

Methods

The contrast method we used is based on the connection of two exercises, the first is the fundamental SQUAT exercise (max strength) , and the second is specific of TKD, the circular kick carried out with the leg in a rear position or Pandalchagi (Fexpl).
The experimentation was conducted on a group of 10 athletes practising TKD (age 21±6, weight 68±10, height 170±10, years of practice 9±4) belonging to different agonistic levels (from regional to international). The group, not being previously used to doing exercises with additional weight, undertook, in 3 weeks, 6 sessions to learn the Squat techniques. In the last sessions the maximum weight of this exercise has been indirectly calculated. In the following week the proper experimentation started, and each athlete, after a brief warm-up, was exposed to a modified version of the SoK test (Villani, Angiari, Tomasso, 2004), in which, by means of an integrated system of photo-cells (placed in front of the advanced position support leg) and a piezoelectric cell platform (wrapped up around the punch bag) the execution time of the Pandalchagi kick was calculated (4 right kicks and 4 left kicks, and the calculation of the average value). After about 20 min. from the first exercise, each athlete carried out a Squat exercise with 80% of the individual maximum(2 sets x 4 reps; rec. 3 min.). After a 4 min. rest the athlete repeated the SoK test (Fig. 1).
To verify the reliability of the test the trial was repeated in two following sessions, at a distance of 4 days from each other. To study the validity of the contrast method and to verify the capacity of increasing the rapidity of the Pandalchagi, the average results of the group were compared before and after the stimulation of the SQUAT exercise. The objectivity was guaranteed a precise standardization of the protocol.

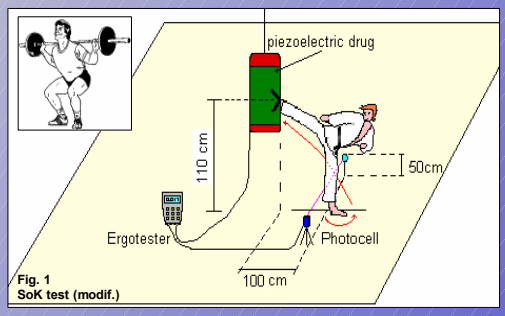

Fig. 1
SoK test (modif.)

Results

The comparison of the results of the SOK test before and after the squat exercise (validity study) shows an higher rapidity of kicks carried out after the stimulation with external weight , with percentages differences between 11% and 17% ($p<0,05$ except in the retest dx). (Tab.1). The results of the reliability study (test-retest correlation) put in evidence r values between 0,82 and 0,89 ($p<0,01$) both for the left and right circular kicks, calculated before and after the squat exercise (Tab. 2).

Tab.1 - Trasversal Comparison (Anova) speed of Kick (sec); pre squat load - post squat load

TECHNIQUE	M pre squat load	M post squat load	Diff%	Anova
Pandalchagi Dx (Test)	0,196	0,162	-17%	p = 0,04515*
Pandalchagi Sx (Test)	0,205	0,180	-13%	p = 0,03919*
Pandalchagi Dx (Retest)	0,184	0,153	-17%	p = 0,05434 (n.s.)
Pandalchagi Sx (Retest)	0,211	0,187	-11%	p = 0,03060*

Tab.2 - Correlation Test-Retest

	speed of Kick (sec); pre squat load			speed of Kick (sec); post squat load		
TECHNIQUE	M Test	M Retest	Correlation	M Test	M Retest	Correlation
Pandalchagi Dx	0,196	0,184	r = 0,84 ; p<0,01	0,162	0,153	r = 0,82 ; p<0,01
Pandalchagi Sx	0,205	0,211	r = 0,82 ; p<0,01	0,180	0,187	r = 0,89 ; p<0,01

Conclusions

Experimentation carried out permit us to affirm that the stimulation method, applied to TKD, can be considered a successful rapidity training system. But we can't disclaim that in some cases, performance increase registered has been lower than Verchoshanskij results (increases even higher than 20%). Probably, to obtain more interesting results, is necessary using this contrast method with athletes with more experience in the use of additional weight exercises. Verification of ours hypothesis will be object of ours next studies.

References:

Verchoshanskij J.V. .(1996). SdS, 36: 23-33
Villani R., Angiari P., Tomasso A. (2004), 9°Annual Congress of the ECSS, 295, Clermont-Ferrand
Villani R., Di Vincenzo V. (2002), 7°Annual Congress of the ECSS, 577, Athens

r.villani@libero.it
www.combatsportresearch.it

Centro Studi e Ricerche Sport di Combattimento