



Elaboration of a specific test to evaluate the execution time of the circular kick in Full contact.

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Introduction

In the Full contact (Kick boxing) the "circular kick" is one of the most important and used technique and its rapid execution is a factor of great importance to excel in this sport.

Many authors, analysed the rapidity of this kind of kick in karate and Tae-Kwon-Do, using different solutions for the survey.

To give our contribution at the researches we started an experimentation of a specific field test that we called Sok Test (Speed of Kick). It permits to evaluate the real duration of the technique and its rapidity.

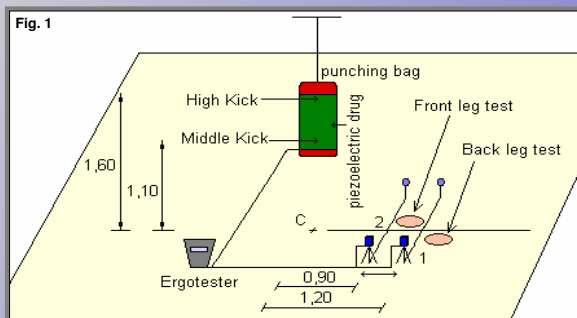
Methods

The instrument we used for this measure is a computer system that gathers and integrates the signal coming from piezoelectric drug and two photocells placed in two different modes (Fig.1). The first one permits to value the technique of the circular kick with the leg behind (dist. 120 cm), the second permits to evaluate the same technique with the front leg (dist. 90 cm). In both trials we could test the kicks to the body and also the ones to the head (Middle Kick = h 110 cm; High Kick = h 160 cm).

The experimentation was carried out on a group of 24 full contact athletes, practising from several years, aged between 17 and 30: 12 amateurs (weight 75±7, height 179±7) and 12 professionals (weight 75±10, height 176±8).

To value the reliability of the tests, each athlete had to perform four times the circular kick in each of the four modes (Front Middle/High, Back Middle/High) and this trial was repeated in the two following days.

To study the validity of the test and verify its capacity to discriminate between athletes of different level we did a cross comparison between the professional group (national/international level) and the amateurs (middle level). The objectivity is granted with a precise standard procedure (Fig. 1).



Results

The results of the study of the reliability (test-retest correlation) pointed out the r values included between 0,81 e 0,97 (p<0,01) for the four modes of circular kick tested in the two groups (Tab.1).

The transversal comparison (study of the validity) pointed out the higher speed of the professionals who had results significantly better than the results of the amateurs (Tab.2) with differences between 36% and 49% (p≤0,0001) in each trial.

TECHNIQUE	Amateur athletes - Best performance (sec)			Professional athletes - Best performance (sec)		
	M Test	M retest	Correlation	M Test	M retest	Correlation
Middle Kick - Back leg	0,298	0,293	r = 0,97 ; p<0,01	0,218	0,211	r = 0,91 ; p<0,01
High Kick - Back leg	0,344	0,348	r = 0,98 ; p<0,01	0,252	0,249	r = 0,94 ; p<0,01
Middle Kick - Front leg	0,264	0,253	r = 0,86 ; p<0,01	0,178	0,171	r = 0,97 ; p<0,01
High Kick - Front leg	0,298	0,292	r = 0,96 ; p<0,01	0,219	0,211	r = 0,81 ; p<0,01

TECHNIQUE	Professionals	Amateurs	Diff%	Anova
Middle Kick - Back leg	0,218	0,298	37%	p = 0,00001
High Kick - Back leg	0,252	0,344	37%	p = 0,00008
Middle Kick - Front leg	0,178	0,264	49%	p = 0,00001
High Kick - Front leg	0,219	0,298	36%	p = 0,0001

Conclusions

The results of the experimentation permit us to point out in the SOK Test, interesting characteristics of reliability (test-retest) and validity (transversal comparison). Therefore we think that this test can be considered a useful way for an exact evaluation of the rapidity of the specific action of the circular kick in Full contact and in other combat sports.

The subject of our next study will be the evaluation of the reaction rapidity of a visual/sound stimulus. We'll do it planning in a different way the computer system so that it can find and integrate the signal coming from the photocells.

References:

Lehmann, G., Norbert Mosch, Willi Lilge (1994). Leistungssport, 24, 21-26.
 Lehmann, G. (1999). Leistungssport, 29, 30-33.
 Villani R., Di Staso M. (2003), 8th Annual Congress of the ECSS, 232-233, Salzburg
 Villani R., Gesuale D. (2003), 8th Annual Congress of the ECSS, 233, Salzburg