Dipartimento di Scienza dello Sport, Nutrizione e Salute, Facoltà di Scienze Motorie
Università degli Studi di Milano, Italia

ISOKINETIC

Isokinetic, 20th annual congress 12/13 March 2011, Bologna - Italy

BALANCE AND SPRINT ABILITY: COMPARISON AMONG FAST AND SLOW YOUNG SOCCER PLAYER

Moranda M, Boccolini G, Bonaccorso S, Alberti G

Department of Sports, Nutrition and Health Sciences, Faculty of Exercise and Sports Sciences, Università degli Studi di Milano, Italy

Introduction

During the match, a football player performs between 46 and 70 sprints for a total of 600-1100 meters(1). If the sprint is carried out under conditions of disbalance, as it often happens due to contrast with adversaries or to non optimal field conditions, then the performance itself is influenced by the ability of expressing strength under conditions of disbalance (3). The aim of this study is to investigate if there is any difference in the muscular power, assessed by the vertical jump (2), and in the ability of balance among two groups of football players divided by the speed of sprint.

Methods

We studied 46 young football players of a professional team (Atalanta BC) aged of 12±1 yrs. Each subject performed 3 sprints for each of the three distances of 5, 10 and 15 m with a recovery time in between of 3 minutes. The mean time of the performances for each distance was considered. The tool used as starter for the chronometer was the optojump and the photocells Polifemo (Microgate, Bolzano, Italy) has been positioned on the arrival line. The libra board (Easytech, prato, Italy) was used in order to detect the monopodalic and bipodalic balance abilities. The subjects had to keep their balance for 30 s on the board (3 valid tests, with resting time of 1 minute in between) with the eyes fixing a point set at a distance of 3 m, at the height of the eyes. The vertical jumping ability has been estimated through countermovement jump (CMJ) with free arms and in both bipodalic and monopodalic support, using the Optojump. The prevalent (prev) limb is defined as the one that expresses more power during the jump. The dominant limb is the one used for the kick. For every test we considered the average of the 3 results. The 46 subjects have been divided into two groups based on the individual sprint times higher or lower than the mean of the entire group. The difference between groups has been analyzed by the unpaired t-test, with the software SpSSv.17 (SpSS Inc, Chicago, Il). Significance was declared when $p<0.05$.

Results

The fastest subjects showed a better performance in bipodalic vertical jump than the slowest ones in the 5 m ($p<0.05$), 10 and 15 m ($p<0.001$) sprints. On the 5 m distance, we found differences between the groups only regarding the ability of vertical jump with the prevailing limb ($p <0.05$). On the 10 and 15 m distances, we find significant differences between the two groups in the ability of vertical jump with the prevailing limb ($p <0.001$) and also in the ability of vertical jump with the not prevailing one ($p <0.001$). Regarding the balance ability, we could not find any significant difference between the groups based on the time of the sprint. nevertheless, the difference among the two groups appears more evident on the the 10 m. In comparison with the average of the entire sample, the bipodalic balance ability has shown a difference of the 22.0% between the two groups for the distance of the 5 m.

The results are shown in Table 1.

M	TEST	UNDER AVERAGE	ABOVE AVERAGE	DIFF %	P<
5 m	Sprint Time (s)	1.15 ± 0.04	1.24 ± 0.03	7.5%	0.001
	CMJ Bip (cm)	33.3 ± 3,9	29.9 ± 4.7	10.7%	0.05
	CMJ Prev (cm)	18.6 ± 3.1	16.6 ± 3.0	11.3%	0.05
	CMJ no-Prev (cm)	16.8 ± 2.8	15.2 ± 2.6	8.7%	n.s.
	Eq Bip (ua)	6.9 ± 2.6	8.4 ± 2.5	20.0%	n.s.
	Eq Prev (ua)	7.0 ± 3.0	7.4 ± 4.0	5.6%	n.s.
	Eq no-Prev (ua)	6.9 ± 3.8	7.2 ± 2.6	4.3%	n.s.
10 m	Sprint Time (s)	1.99 ± 0.05	2.17 ± 0.06	8.7%	0.001
	CMJ Bip (cm)	34.3 ± 3.5	28.8 ± 3.7	17.3%	0.001
	CMJ Prev (cm)	19.6 ± 2.5	15.6 ± 2.4	22.5%	0.001
	CMJ no-Prev (cm)	17.7 ± 2.2	14.3 ± 2.2	21.1%	0.001
	Eq Bip (ua)	7.5 ± 2.3	7.6 ± 3.1	1.3%	n.s.
	Eq Prev (ua)	6.8 ± 3.1	7.6 ± 3.7	11.2%	n.s.
	Eq no-Prev (ua)	7.3 ± 3.7	6.7 ± 2.9	8.5%	n.s.
15 m	Sprint Time (s)	2.81 ± 0.07	3.02 ± 0.11	7.2%	0.001
	CMJ Bip (cm)	34.1 ± 4.0	29.0 ± 3.5	16.1%	0.001
	CMJ Prev (cm)	19.6 ± 2.6	15.6 ± 2.4	22.5%	0.001
	CMJ no-Prev (cm)	17.6 ± 2.6	14.5 ± 2.0	19.2%	0.001
	Eq Bip (ua)	7.4 ± 2.3	7.6 ± 3.1	2.7%	n.s.
	Eq Prev (ua)	6.7 ± 3.1	7.7 ± 3.7	14.0%	n.s.
	Eq no-Prev (ua)	7.3 ± 3.7	6.8 ± 2.9	7.1%	n.s.

Table 1. Mean±DS of group under the average of total sample of the time of sprint and of the group above the average; Diff %: % difference among two groups in comparison with the average of the total sample. CMJ: countermovement jump; Eq: balance; Bip: bipodalic; Prev: prevalent limb; no-Prev: not prevalent limb

Figure 1. Example of balance training exercise.

Figure 2. Optojump and photocells Polifemo system.

Conclusion

Significant differences between the two groups were found comparing the performances in vertical jumps with the sprint time on the 5, 10 and 15 m distances. These differences are more evident on the 10 and 15 m. On the contrary, we could not find any significant difference between the two groups analyzing the comparison between balance and sprint times. The reason could be found right in the Balance Training exercises performed in the same way by the two groups. Right for this reason the Balance Training exercises could be used for injury prevention of young football players.

References

1.Bangsbø J, Norregaard L, Thorso F. *Activity profile of competition soccer*. Can J of Sport Sci 16: 110-116, 1991.

2.Schmidtbleicher D. *Training for power events*. In: Komi PV, ed. Strengthand power in sport. Oxford: Blackwell Scientific Publications: 381–95. 1992

3.Wisloff U, Castagna C, Helgerud J, Jones R, Hoff J. *Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players.* Br J Sports Med 38: 285-288, 2004.