7

RELATIONSHIP BETWEEN VERTICAL JUMP, BALANCE CONTROL AND SPRINT WITH CHANGES OF DIRECTION

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Introduction

Often it is necessary for football players to demonstrate strength in situations where their bodies experience disbalance, such as during a sprint, after a change of direction, tackling an opponent or when the pitch is in bad condition.
Previous studies showed that unstable surface training improves performance in the agility T test (1) and in the expression of strength during vertical jumps (2).
The aim of this study is to establish the relationship between the capability arrived at during a one leg vertical jump, a one leg balance control and during the changing of direction.

Methods

Twenty-five young amateur football players were tested. The single leg vertical jump ability was tested with a free arm counter movement jump (CMJ). The measurement in these tests was done by use of an Optojump (Microgate, Bolzano, Italy). The subject was tested after doing 3 jumps on each leg.
The ability of change of direction (CoD) was tested with the 505 agility test (2). During this test the subject does a sprint with CoD of 15+15 meters and the time was estimated in 4 split: 10 meters, 5+5 meters (CoD), 15+5 meters, 15+15 meters (total time test). This was done using a timer connected to two Polifemo photocells (Microgate, Bolzano, Italia), one on the starting line and the other on the 10 m line. The subjects then did 3 CoDs with right leg and 3 CoDs with the left one. The balance ability was assessed by the Libra board (Easytech, Prato, Italy). The subjects tested had to maintain their balance on the tilting balance-board for 30 s for each trial, for a total of 6 valid trials per leg. The correlation was studied using the Pearson correlation coefficient using the SpSS v.15 software. (SPSS INC, Chicago, IL).

Results and discussion

The result are reported in table 1.

	Split 10 m	Split 15+5 m	Split 5+5 m	Split 15+15 m
CMJ right	-0.45 *	-0.52 **	-0.42 *	-0.57 **
CMJ left	-0.65 **	-0.40 *	n.c.	-0.63 **
Balance right	-0.41 *	n.c.	n.c.	n.c.
Balance left	n.c.	n.c.	n.c.	n.c.

Table 1. Pearson correlation coefficient between vertical jump, balance control and e 505 agility test.
* P<0.05; ** P<0.01.

From the analysis of the results there is no correlation between single leg vertical jump and single leg balance tests.
Negative correlation was found between monopodalic vertical jump and various split of the 505 agility test. No correlation was found among CMJ ability with left leg and the 5+5m split during CoD with left leg; probably because a CoD involves both technical and coordinative aspects. A negative correlation was found between balance test with right leg and 10 m split during the 505 test.

Conclusion

The vertical jump ability, therefore the power of lower-limb, is correlated with performance during sprint with CoD in 505 agility test. This would confirm the hypothesis that training for power and strength would cause better performances in both the sprint and CoD.
The absence of a correlation with balance ability could probably be explained by the lack in balance abilities of the studied subjects. Meyer et al., (3) have shown that by improving balance there will be a better postural control and better power and strength performances during sports activities.

References

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