DEVELOPMENT OF AGILITY IN SOCCER

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ABSTRACT

Currently there is an invasion of modern sophisticated innovative technologies into the training practice, which should increase the effectiveness of training process. Agility training is included in them too. Modern concept of agility development includes open skills, where the fast change of direction of movement is carried out in the training conditions, which are not structured so much, and that is why they resemble the match conditions much more. In the work authors deal with the possibilities of development of agility in the conditions of soccer teams. The main research method is natural pedagogical experiment realized in two adult teams. Experimental stimulus, which is formed by specific and non-specific means focusing on agility development, is implemented in the training process of the experimental group (n=18) twice a week, while the reference group (n=9) went through a standard training process. For the measuring of the level of agility the standardized testing device Fitro Agility Check was used. Results were evaluated using Wilcoxon pair test. It was expected that under the impact of the 8-week-long agility training applied in the experimental group statistically significant changes will be recorded, while no statistic changes will be observed in the reference group. We also expected that right-legged players will record shorter reaction time in the item right-forward and left-legged players in the item left-forward. Results of the experiment did not prove the hypothesis because of no statistically significant improvements in agility level were found in the experimental group. Similarly, no significant changes were observed in the reference group. The hypothesis No. 2 that in players with the dominant right leg the shortest reaction times will be recorded in the item right-forward, while in the left-legged players the shortest reaction times will be recorded in the direction left-forward.

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Key words: agility, sport preparation, specific and non-specific training means, soccer

INTRODUCTION

Experts do not have the same opinion on the definition of the complex quality termed „agility“. Šimonek (2013) defines „agility“ as a complex motor ability, which is manifested by the fast movement of the whole body with sudden changes of direction or speed of movement, as a reaction on an unknown stimulus. This characteristics includes in itself also cognitive components such as optic sensing and processes of decision, which participate in the sport performance, as well as motor components, which include acceleration, deceleration and changes of direction as a reaction to the movement of an opponent, sprint with the change of direction in order to contact the ball or player, as well as complex reaction on a certain stimulus.

Agility in soccer

Contemporary soccer is characterized by a high tempo of movement of players, who have to perform a wide choice of movement patterns in full speed and time deficit, on a narrow space caused by the attacking opponent. This tempo is permanently increasing, which is attractive for a spectator. Trainers should seek new training methods, by which they succeeded in preparing players for matches most effectively.

It is not possible to increase the number and time of training sessions any more without threatening the health of players. Further increase in the players´ performance depends on the qualitative component of training not the quantitative one. Trainers are therefore pressed to look for other, more effective forms of training. One of these methods is agility training (Ivanka a kol, 2009).

There exists a marked difference between the ability to run and change directions according to the previously known plan, and the specific ability called „agility“, which includes fast sprinting ability and simultaneous reactions on signals accruing from the game itself (movement of ball, opponent or teammates). In initial phases of agility training we can develop the movements improving agility by various exercises through repeating specific drills. These drills include overcoming obstacles (cones, slalom poles). Such training of running with changing of speed represents the so-called „close skills“, since movements are known in advance and neither require any reaction nor decision (Sheppard &Young, 2006).

In various definitions of „agility“ authors state that the change of speed or direction of movement is a reaction to a certain external stimulus. The planned movements connected with the change of direction and performed in static training conditions should be shifted into the conditions of the so-called „open skills“ (requiring reaction with choice on an unknown stimulus), with the aim to improve the level of agility (Craig, 2004). If a sportsman should react to an external stimulus and change the original direction and speed of movement based on this stimulus, we should adjust the training to this.

This method of training stimulates the changes in postural muscles and improves the technique of performing the change of direction and speed of movement. Moreover, these skills help to reduce the incidence of injuries, since high loading affecting the knee joint at the reaction to an unforeseen stimulus could cause an injury of a sportsman upon sudden change of direction and speed of movement. Suitably built dynamic nervous muscular training, which stresses postural regulation and correct coordination of movements of lower limbs during a sudden change of direction and speed of movement (e.g at „active“ defender), is important for the prevention of non-contact injuries of knee (Besieret al., 2001).

In team sports two concepts of agility development are known (Bloomfieldet al., 2007). The first one represents the training of mechanics of movement, where relatively closed skills are implemented. Specialized commercially available tools are frequently used (coordination ladders, mini-hurdles, etc.). This concept, however, does not include an important component of decision processes and complex reaction ability. The second concept is the development of agility with relatively open skills, upon which the sudden change of speed is trained in training conditions, which are not structured so much and therefore they resemble match conditions more.

Based on the above mentioned it is clear that it is just agility development in soccer, which is the most important factor, which is less frequently used in the preparation of our players. Trainers should find the way how to optimize training load so that players at the beginning of summer conditioning period need not run so many kilometers in aerobic zone, but develop speed and strength potential in anaerobic regime, while adaptation of the organism is reached also under the impact of these means carried out in maximal and submaximal zone of loading intensity. We expect that by means of improving individual factors of agility also the whole complex ability would improve which could positively improve the quality of play of soccer players and reduce the number of injuries.

The aim of our work was to find out the changes of the levels of reaction and speed abilities as the components of agility after an 8-week-long agility training in non-competition conditions of training.

METHODS

The main method of research was pedagogical two-group experiment realized in natural conditions, which were carried out during the summer preparation period in season 2012/2013. The experimental group was formed by the players of FC Studienka (n=9), the reference group was formed by the team of ŠK Gajary (n=9).

Experimental factor

Experimental period lasted for 8 weeks, during which we carried out 8 training microcycles. The preparation consisted of training units into which special agility exercises were included and which lasted 20-30 minutes at each unit. Exercises were focused on complex reaction speed, cyclic speed, frequency of movement, acceleration, speed of defensive movement, speed of changing the direction of movement, speed of game activities of players (shooting while running). Exercises performed in maximum intensity were implemented in training units 3 times a week. Training program was focused on specific training means – exercises with cones, coordination ladder and medicine balls.

Methods of data mining

1. Testing of agility using FITRO Agility Check.
2. Measurement of somatic parameters.

Statistic methods

Wilcoxon´s signed-rank test was used to find differences between two medians.

RESULTS

FITRO Agility Check in individual teams brought the following results (tab. 1 - 3).

Tab. 1 Values measured in experimental and reference groups using FITRO Agility Check

Experimental group			**Reference group**		
Name	Input	Output	Name	Input	Output
P. H.	1499.5	1197.8	L. H.	1229.2	1199.7
V. Ď.	1627.3	1348.9	R. C.	1242.8	1269.2
O. K.	1228.7	1183.2	R. P.	1312.5	1448.3
D. L.	1110.8	1132.3	M. R.	1315.8	1362.8
P. M.	1506	1133.3	A. Š.	1291	1644.5
M. N.	1241.2	1101.1	D. Š.	1267.9	1235.7
M. S.	1161.8	1214	M. S.	1353.3	1247.6
M. Ť.	1214.8	1171.3	M. T.	1368.7	1238.8
P. T.	1277.8	1418.6	J. V.	1401.6	1261.6

Tab. 2 Calculation of Z value by Wilcoxon Signed Ranks Test

Wilcoxon´s test		
	EG input - output	RG Input - output
Z	-1.362[a]	-.178[a]
Asymp. Sig. (2-tailed)	.173	.859

Tab. 3 Descriptive statistics and Wilcoxon Signed Ranks Test in EG

Group **Input**		**EG**		**RG**	
		Output	**Input**	**Output**	
N (number of players)		9	9	9	9
Mean value		1318.65	1211.16	1309,2	1323,13
Standard deviation		179.38	105.44	58,01	142,7
Minimum		1110.8	1101.1	1229,2	1199,7
Maximum		1627.3	1418.6	1401,6	1644,5
Percentils	25^{th}	1214.8	1133,3	1267,9	1238,8
	Median 50^{th}	1241.2	1183,2	1312,5	1261,6
	75^{th}	1499.5	1214	1353,3	1362,8
d=Me-Me		58		50.9	
Z		1.362		0.178	
P		0.173		0.859	

Based on the measured values we can state that there were no statistically significant changes recorded in the experimental group (EG). *Z-value* was 1.362 which was lower than the critical value 1.96. In the reference group no significant changes were recorded (*Z-value* 0,178 is less than the critical value 1.96), which signalizes no significant changes in the reference group, too. The results of both groups are depicted in Fig.3.

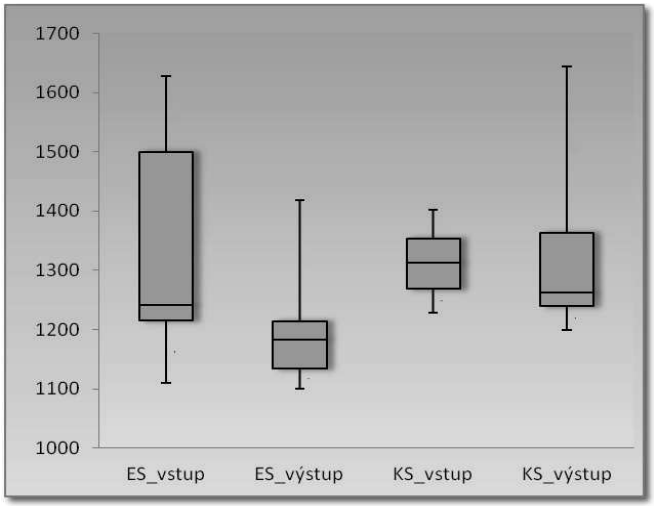

Fig. 3
Test results – Wilcoxon Signed Ranks Test in EG (input-output) and RG (input-output)

From all the measured values the shortest time was recorded in the right forward direction (1207.25) (tab. 4).

Tab 4 Calculation of medians from all measured values

Direction	Left back	Right back	Left forward	Right forward
Median of values of all players	1237.1	1252.1	1271.1	1207.25

Medians of players with the dominant left leg were calculated. The shortest reaction times were recorded in the left back direction. The lowest value was 1219 (tab. 5).

Table 5 Calculation of medians of left-legged players

Direction	Left back	Right back	Left forward	Right forward
Median of values of all players	1219	1252.1	1255.9	1288.6

The lowest value in right-legged players (tab. 6) was 1196.9 in the right forward direction, thus proving our hypothesis. It was also proved that longest times were recorded in the direction left forward in both left and right-legged players, and also in the front direction shorter times were measured.

Table 6 Calculation of medians of right-legged players

Direction	Left back	Right back	Left forward	Right forward
Median of values of all players	1244.4	1251.4	1277.85	1196.9

CONCLUSIONS

Our hypothesis that in players with the dominant right leg shortest times will be recorded in the right forward direction was proved. We expected this based on the fact that right-legged players stand on their stronger and faster foot, which is left one.

Wilcoxon´s test proved that no significant changes were recorded after the application of the special programe of exercises in the training of experimental group.

Our expectation that the shortest times will be recorded in the forward direction was not proved because the shortest times were recorded in the left back direction. The experimental program of specific exercises has brought certain increments in the quality of performing fast coordinated movement of players in the experimental group, however, the changes were not statistically significant. We expect that using the exercises for a longer time would bring statistically significant changes in agility.

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