

Comparative study regarding physical characteristics at male handball players activating on wing and pivot positions at Romanian team Steaua Bucharest

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Abstract

Aim and purpose. The main purpose of this article was to evaluate the differences between physical characteristics at wings and pivots (nine subjects), male handball experienced players, from Romanian handball team Steaua Bucharest, previous to their participation in the Romanian National League, competitive season 2013-2014. **Material and methods.** In order to achieve this research on the motric evaluation of the players that activate in the 6m. line at team Steaua Bucharest, that activates in Romanian National League, before competitive season 2013-2014, we used the following research methods: literature review, testing method conducted by using five control samples in order to establish the physical qualities of the handball players understudy, the data collected was used to analyze the motric performance of wing and pivot players; the statistical and mathematical method was used to underline the differences between the players that activate in the three positions on the team. **Results.** The interpretation of the results led to establishing the differences in terms of physical qualities between 6m line players from Romanian male handball team Steaua Bucharest. Results revealed that there are no significant differences in terms of physical qualities between wing players and pivot players. **Conclusions.** After processing and interpretation of results we can state that the performance of the 6m. line players of the Romanian team understudy was a good one with no significant differences between the results obtained by wings and pivots at the battery of tests (five tests) but after this analysis, coaches could perfect their training program in order to achieve better physical results because it is known that motivation, tactics and technical skills play a far more important role in team sports than any other characteristics, but without a good physical training these abilities are incomplete.

Keywords: physical qualities, wing and pivot positions, male handball, physical training.

Rezumat

Obiective. Cercetarea a avut ca obiect de studiu aprecierea nivelului pregătirii fizice generale și specifice a handbaliștilor (nivelul seniori) în dependență de postul de joc, pentru jucătorii care ocupă posturile de extremă stângă, extremă dreaptă și pivot (nouă subiecți), sportivi componenți ai echipei de handbal masculin Steaua București, echipă care își desfășoară activitatea în cadrul competiției Liga Națională a României, evaluarea lor fiind realizată în august 2013, înainte de participarea lor în campionatul românesc. **Material și metode.** Pentru a realiza acest studiu privind evaluarea motrică a jucătorilor din linia de 6m., în cadrul echipei Steaua București, care activează în Liga Națională a României, înainte de participarea ei în sezonul competițional 2013-2014, am utilizat următoarele metode de cercetare: analiza literaturii de specialitate, metode de investigare a capacității motrice specifice jucătorilor de handbal realizată prin folosirea a cinci probe de control în scopul de a stabili calitățile fizice ale jucătorilor de handbal, datele colectate au fost utilizate pentru a analiza performanța motrică a sportivilor; metoda statistică și matematică fost folosită pentru a sublinia diferențele dintre jucătorii care își desfășoară activitatea pe cele trei posturi din echipă. **Rezultate.** Interpretarea rezultatelor a condus la stabilirea diferențelor, în materie de calități fizice dintre jucători liniei de 6m componenți ai echipei românești, Steaua București. Rezultatele au arătat că nu există diferențe semnificative în ceea ce privesc calitățile fizice ale jucătorilor care activează pe posturile de extremă stângă, extremă dreaptă și pivot. **Concluzii.** După prelucrarea și interpretarea rezultatelor putem afirma că performanțele obținute de către jucătorii extreme și pivoți ai echipei românești au fost bune, diferențele dintre aceste posturi au fost nesemnificative, dar după această analiză, antrenorii pot îmbunătăți programul de pregătire al jucătorilor de 6m. cu scopul de a obține rezultate fizice mai bune, deoarece se știe că motivația, tactica și abilitățile tehnice joacă un rol mult mai important în sporturile de echipă decât orice alte caracteristici, dar fără o pregătire fizică bună aceste abilități sunt incomplete.

Cuvinte cheie: calități fizice, extreme și pivoți, handbal masculin, pregătire fizică.

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Introduction

In terms of physical performance, handball is a complex, intermittent sport, requiring efforts of maximum intensity in a short period of time, the players jump, run and throw the ball at speed, followed by low intensity moments. (1,2).

Maximal oxygen uptake seems to be an important factor which distinguishes players according to their level. Depending on the level of competition and the position in the team, handball players usually cover a distance between 4.5- 6.5 km and require high levels of aerobic capacity to aid recovery after high-intensity bouts of activity (3, 4, 5).

In the approach of the concept of physical training we should start from its definition. Thus, in an increasing number of papers of specialists (6, 7, 8, 9, 10, 11, 12, 13) the main purpose of physical training is formulated as being the level of development of motor possibilities for the individual, the level reached in the systematic practice of physical exercise.

Properly speaking, physical training constitutes the support for the other components of training, being also the starting point for the whole process of preparation (9, 13-18).

The unit between the specific and general orientation of training is a very important methodical aspect. In the majority of sports, physical training constitutes the support for increasing the performance, the efficiency in terms of technical and tactical behaviour, being conditioned by the level of motor qualities, especially of the dominant ones (9, 17,13). General physical training must be doubled by a good specific training (9, 11, 13, 17, 19-25).

Within the process of training, evaluation is a requirement in order to determine the level of achievement of objectives not only at the end of the activity, but also rhythmic with an operational and proper character, constituting a permanent variable of the "field or of the training area" (17).

The motor skills such as sprinting, jumping, flexibility, speed and throwing are considered important aspects of the game that contribute to high performance of the team (26, 27, 28).

Aim

The aim of the present study was to define the physical characteristics of Romanian male handball players and to determine the differences in physical

qualities between wing and pivot players. We assume that the wing players compared to pivot players will surpass them in terms of physical fitness characteristics.

Purpose

The results obtained from the physical performance tests will allow trainers to identify players weaknesses and design training models for improving specific athletes deficiencies, but also follow up the athlete's improvement during a competitive season. Furthermore, the data of the present study would show the differences, in terms of physical features between players that activate on wing and pivot positions.

Material and methods

Subjects

The total sample consisted of 9 male handball players (three left wings, three right wings, three pivots) that operate on left wing, right wing and pivot positions, with ages between 24 and 34. All players are components of Romanian handball team Steaua Bucharest, team that participates in a National League competition, the highest league in Romania. The 6m line players were tested in august 2013, before the competitive season 2013-2014 and the tests used were also required by the Romanian Handball Federation.

Testing procedure

Five variables were recorded for each player. These variables included aerobic and anaerobic capacity, explosive power of the lower and upper limbs, coordination and dribble technique of the ball, flexibility and running speed.

Aerobic capacity was tested using Cooper Test which requires a 12 minute run, the decasalt test was used for assessing the explosive power of the lower limbs by instructing players to stand behind a line and jump as far as possible using 10 skip jumps. Explosive power of the upper limbs was tested by throwing the ball with 3 steps from a marked line. For measuring the running speed of the 6m line players we used a 5X30m speed run with a pause of 30 seconds between repetition, the best result was selected and for the coordination and dribble technique of the ball we used a route in order to perform dribble through five cones. All of five tests that were used are also required by the Romanian Handball Federation.

Statistical Analysis

Descriptive data (mean and standard deviation) were computed for all variables. Independent t-tests were applied for testing significant differences between left wing, right wing and pivot players at all the control tests the players were submitted.

Results

The evaluation of general and specific physical training was performed by using five control

samples, tests imposed by the Romanian Handball Federation (5x30m. speed run, Dribble through five cones, Cooper Test, decasalt and handball throwing with three steps). The testing was made on the players that activate on wing and pivot positions, components of male handball team Steaua Bucharest, the testing period was august 2013 (the results are shown in Table I).

Table I. Performances and scores obtained by the players operating on wings and pivot positions from team Steaua Bucharest at the motility tests

	5x30m speed run		Dribbling between five cones		Cooper Test		Decasalt		Throwing the ball	
	P.	Po.	P.	Po.	P.	Po.	P.	Po.	P.	Po.
LW	3"8	82	5"9	82	3400	100	31	100	50	65
	3"7	90	5"8	90	3340	100	29.3	72	48.5	60
	3"6	98	6"1	66	3285	92	28.6	65	54	79
RW	3"9	74	6"0	74	3300	95	28.6	65	48	59
	3"8	82	5"9	82	3280	91	29.3	72	49,5	63
	3"7	90	5"8	90	3390	100	30	79	55,5	85
P	3"7	90	6"1	66	3310	97	28	59	51	68
	4"0	66	5"9	82	3265	88	27,8	57	53	75
	3"8	82	6"0	74	3210	77	27.2	51	49	62

LW - left wing, RW - right wing, P - Pivot, P. - performances obtained, Po.- Points achieved

In order to highlight the evolution of motric parameters of the players operating on left wing, right wing and pivot position during the research, we chose to centralize the results expressed by them, using the scores imposed by the Romanian Handball Federation.

The results, in points obtained by players operating on left wing, right wing and pivots from male handball team Steaua Bucharest at the five control

tests and the statistical data (Mean and standard deviation) are shown in table II.

Tabel III presents the results of the 6m line players together with the statistical indicators, mean and standard deviation.

Statistically significant differences weren't found between wings and pivot players in none of the tests that were used and the reason for these could be that these players have the same tasks in the field.

Table II. The statistical results of the points obtained by players operating on left wing, right wing and pivots from male handball team Steaua Bucharest at the five control tests (Mean±sd)

Game position/ Control tests	Left wings	Right wings	Pivots
5x30m. speed run	90±8	82±8	79.33±12.22
Dribble between cones	79.33±12.22	82±8	74±8
Cooper Test	97.33±4.61	95.33±4.5	87.33±10.01
Decasalt	79±18.52	72±7	55.66±4.16
Throwing the ball	68±9.84	69±14	68.33±6.5
Total points	413.6±14.57	400.3±39.52	364.6±17.24

Table III. The statistical results obtained by players operating on left wing, right wing and pivots from male handball team Steaua Bucharest at the five control tests (Mean±sd)

Game position/ Control tests	Left wings	Right wings	Pivots
5x30m. speed run (s)	3.7±0.1	3.8±0.1	3.83±0.15
Dribble between cones (s)	5.93±0.15	5.9±0.1	6±0.1
Cooper Test (s)	3341.6±57.51	3323.3±58.5	3261.6±50.08
Decasalt (m)	29.63±1.23	29.3±0.7	27.66±0.41
Throwing the ball (m)	52±2.82	51±3.96	51±2

Discussions

Sprinting velocity for short distances is an important element of performance in team handball. Wings and pivot players are required to cover distances between 30-35 m with maximal speed especially when they run on counterattack. 6m. line players of the present study shown similar values at the 5X30m speed run, differences in sprinting ability between wings and pivots were not significant.

At these control test, left wing players had an average of 3.7 and a standard deviation of ± 0.1 , right wing players obtained an average of 3.8 and a standard deviation of ± 0.1 and line players presented a mean and standard deviation of 3.83 ± 0.15 .

Technique, speed, and coordination of the ball is an important aspect of the attack and we evaluated them using the test dribble between five cones on a 30m distance. Regarding the average and standard deviation, the results of the athletes are the following: the best data was registered by right wings 5.9 ± 0.1 , left wings 5.93 ± 0.15 and pivots 6 ± 0.1 . All three positions require from the players good technique, speed, and coordination because they have a small area of action, wings because of their placement on the sides of the field and pivots because of the continuous fight in the central area of the field in order to create a situation to score or create lanes of penetration for his teammates.

Endurance was tested using the Cooper Test that requires 12 minutes running and after the regular time the distance is measured. The best results were obtained by players from the left wing position, players that ran an average of 3341.6 in 12 minutes. They are closely followed by right wing players with a mean of 3323.3 and pivot players with a value of 3261.6. Regarding the fact that in

the handball game the effort is mixt, it is important that trainees keep in mind this issue and improve this physical quality.

The decasalt control test made by players using ten jump steps was chosen because it shows the degree of strength in the lower limbs, important for jumping before a throw and for defense movements and evaluates the ability to achieve high muscular force very fast. 6m. line players from Romanian male handball team Steaua Bucharest exhibit similar values in decasalt. An interesting finding was that no significant differences were found between them because of their anthropometric characteristics, pivots being robust players with a bigger body mass compared to wings that are lower in weight and height. The results obtained are the following: left wings 29.63 ± 1.23 , right wings 29.3 ± 0.7 and pivots 27.66 ± 0.41 .

Throwing power of a handball player is a very important component contributing to the success of an attack phase or a tactical action in a game. In the present study, the athletes that operate on wings and pivot positions obtained the following results by throwing the ball from a distance: left wing players 52 ± 2.82 , right wing players 51 ± 3.96 and line players 51 ± 2 . Between these three positions we didn't find significant differences after using the independent t-test. It seems that the players of the male handball team Steaua Bucharest that activate on these positions have almost the same strength in the upper limbs. The importance of throwing power of a handball player in a game, both in defense and offense, is evidenced by the fact that many coaches are trying to improve the throwing parameters, the throwing velocity increased compared to previous years and it seems that in the last years several studies have been written on this subject.

Conclusion

The research examined the differences in regards of physical qualities between players that activate on wings and pivot positions from male handball team Steaua Bucharest, playing in Romanian National League using a battery of motor tests and concluded that there are no significant differences between these three positions. Well developed physical qualities determined by a good training process alongside a good ball maneuvering technique and rich tactical knowledge can be the difference between a good player and a better one, a good team and a fabulous one, winning and losing.

Given the fact that wings and pivots are leading positions in attack and the first players that run in offense after recovering the ball, in order to score after a fast break, the sprinting speed of these players is very important and contributes to throws success percentage after a fast break, a good training program is essential to enhance the quality of these players.

The evolution of standard tests that contain demands closer to game along with the continuous evaluation of physical qualities are important for the future of team handball.

No significant differences were found between left wings, right wings and pivots in none of the five tests, because of their similar tasks in both defense and offense compartments and their position in the field, these players depend heavily on the actions of players from the second line of the attack.

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