Analysis of the Interrelation of Speed and High-Speed Endurance in 14-17 Years of Football Players

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Abstract

In the analysis of the optimal interrelation between the general and special high-speed physical qualities of young footballers of 14-17 years old, normative tests were used to measure speedy physical performance. It was determined the optimal age group in the test analysis processes of general and special speedy performance young group footballers.

Keywords: *Shuttle running 5*30m, standard "8" ("eight"), "high-speed equipment", complex coordination movement, sensitive period, "microgate" device, correlation coefficient, intensity.*

Introduction

From the first days of independence of Uzbekistan by the state, special attention, as well as other sports, was given to football. A clear confirmation of the above statements is that, according to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 144 of March 18, 1993 "On Measures for the Further Development of Football in the Republic of Uzbekistan", several measures have been outlined to restore the traditions of the Pakhtakor football club and determine the educational training complex "Kibray" the main training base of the national team. After one year after the adopted resolution, at the 1994 Asian Games held in Hiroshima and Nagasaki, the Uzbekistan national football team was successful in becoming champions. All this testifies to the increased attention of the state to football[1].

The further favorable condition of qualitative growth of football in republic became the Decision of the President of Republic Uzbekistan from March, 16th, 2018 for №ПП3610 "About measures on the further development of football", accepted with the purpose of formation of national team of Uzbekistan, and also perfection of preparation of gifted young shots and their inclusion in structure of a national team. The same decision provides specific instructions for the establishment of children's and youth football academies in the Republic of Karakalpakstan. These academies are created with the aim of training highly qualified football cadres from young talented players[2].

Relevance: In recent years, on the world stage, during international competitions, there has been an annual increase in the intensity of the pace of the game, i.e. the increase in the speed of the implementation of technical and tactical actions during the struggle for the possession of the ball. The growth trend of the game speed leads to the universality of the players' actions. At the same time, defenders of the flanks, who even perform the tasks of playmakers in the attack, take part in the attack (as a creative participant in organizing the attack and as a football player directly organizing the start of this attack). And this, over the course of many years of preparation, requires approaching the intensity of training loads to the pace of the speed requirements of the playing period, and this is especially necessary to consider when developing speed endurance for young players.

Such physical quality as speed must be developed from 13-14 years. The reason for this is that this age is considered a sensitive period in the development of speed[3].

The speed of young football players is developing at different rates depending on their abilities. In the growth of sportsmanship of young football players aged 12-13 years, the growth of physical performance, the integrated

development of speed and coordination qualities, and the implementation of special coordination of complex technical actions are of great importance.

14-15-year-old players are distinguished by their speed abilities, high activity of training and competitive actions, dribbling with complex coordination movements, and high-speed qualities.

And for 16-17-year-old players, physical performance, the integrated development of speed and coordination, the ability to perform complex coordination movements during the game are well developed.

- Due to the intensity of games during competitions, it can be very difficult to maintain a high level of speed qualities. In the process of training during the competition, it is necessary to develop their individual speed qualities taking into account the abilities of each player. In D. Sirenko's researches most suitable development of speed qualities was carried out by separate groups taking into account individual abilities and age of players, as a result of which speed qualities were developed optimally after application of the following exercises:

- Running from a high start on 15 meters: - 15 summer defenders, - 15-16 summer midfielders, 17 summer strikers;
- Running at 60 meters: - 16 summer defenders and midfielders, - 15-17 summer strikers;
- Run for 100 meters by 15 summer players;
- Driving the ball at 30 meters: - 14 and 15-year-old defenders, 13.15 and 17-year-old midfielders, 14.16, 17-year-old attackers [4].

Object and Subject of Research: As the object of the study, the study was chosen to study the development of general and special high-speed quality for 48 students of football players of the Republican boarding school of the Olympic reserve, aged 14 to 17 years, 12 people in each group. The subject of the study is the study of the correlation between general and special physical qualities by adopting standards: 30-meter running, 5 * 30m shuttle running, and the "8" («eight») test.

Aims and Purposes: The research aims to study the most suitable interrelation between general and special speed qualities of 14-17-year-old players, taking into account their age characteristics.

Based on the purpose of the research, the following tasks were selected:

- Application of norms of high-speed running without a ball for 30 meters and shuttle running 5*30m with a ball for studying the correlation between general and special high-speed qualities of 14-17-year-old football players;
- Using correlation analysis of features with general and special speed qualities of 14-17-year-old football players.

Research Practice: The research was conducted in July 2018 at the Republican School of Olympic Reserve with 12 football players in 4 age groups. Using a Microgate measuring instrument (Misrogate) during the study, 3 standard tests were applied (table 1):

The first standard test is "30 meters running." when starting a run from a high start, speed measuring instruments are installed at the "Start", "10 meters from the start" distances and on the "Finish" line. In the standard, 30 meters running, the speed of overcoming distances of 10 meters and 30 meters are determined simultaneously.

The second standard test is a shuttle running 5x30m. Microgate speed measuring instruments are installed at the intersection of the "Start" and "Finish" lines, where time is detected only when the football player has completely crossed these lines. This method determines the completeness of the intersection of the start and finish lines by football players.

The third standard test is the "8" ("eight") test. Four cones are placed on four sides in the form of a quadrangle and one cone is placed in the center. The distance between the cones is 10 meters. The soccer player must speed the ball from the cones in the corner to the cone in the center. The micro-gate speed meter shall be installed on the Start and Finish lines.

Methodologies

Tests have been used to check physical properties: Start speed "Running at 10 m", Longdistance speed - Running at 30 m", Shuttle running 5*30m, special coordination - Test "8".

Microgate Method:

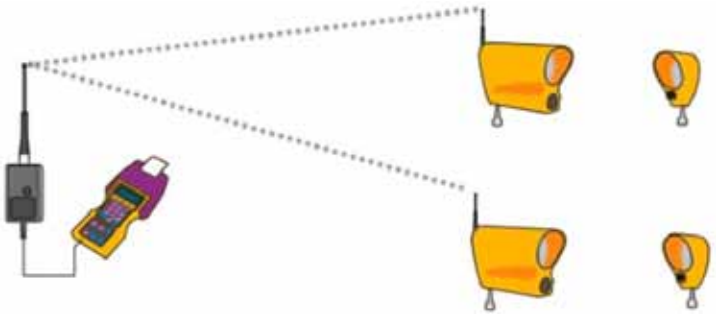


Fig. 1: The Device Microgate Racetimer 2

Source: http://www.microgate.it/Timing/Products/Kit-Racetime2-Light-Radio/Description

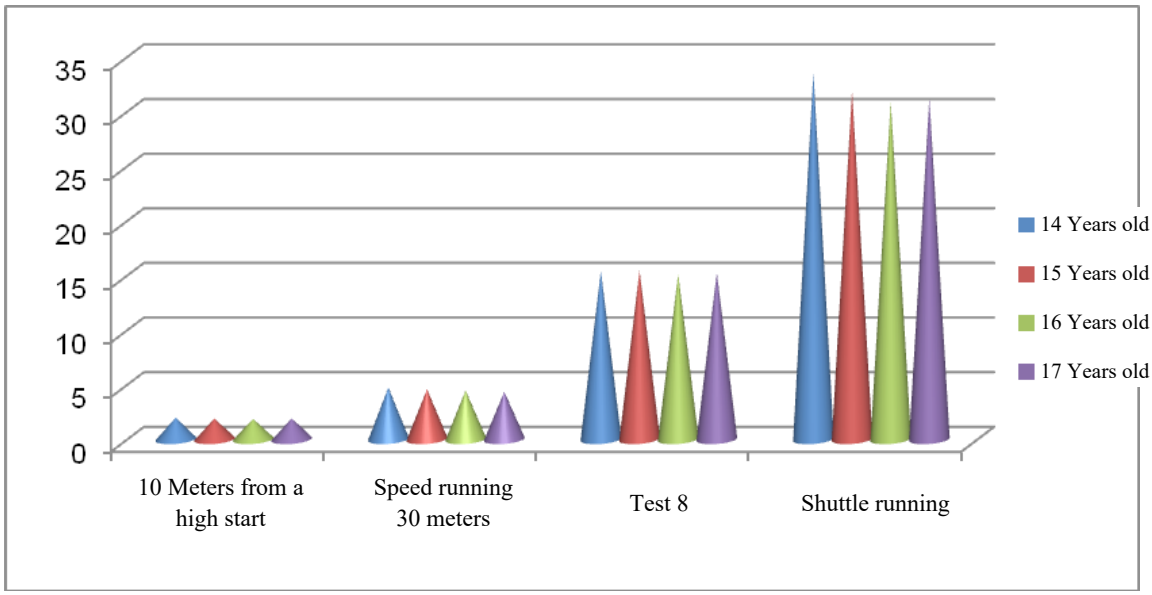
Fig. 1: Evaluation of Microgate Speed Measuring Device ("Microgate")

Table 1: The results of the time standards for running 10 meters from a high start, high-speed running 30 meters, shuttle 5x30m and test "8" for players aged 14-17 years old (2018)

№	Initials of a surname and a name				30metres per second running				10 metres per second running				5x30 metres per second shuttle running				Standard"8" («eight») (seconds)			
	14 years old	15 years old	16 years old	17 years old	14 years old/ sec	15 years old/ sec	16 years old/ sec	17 years old/ sec	14 years old/ sec	15 years old/ sec	16 years old/ sec	17 years old/ sec	14 years old/ sec	15 years old/ sec	16 years old/ sec	17 years old/ sec	14 years old/ sec	15 years old/ sec	16 years old/ sec	17 years old/ sec
1	T-K.	A-J.	T-M.	A-F.	4,62	4,42	4,39	4,42	2,06	1,84	1,92	1,81	30,61	31,94	31,76	35,81	14,08	15,56	15,1	14,92
2	G-F.	K-J.	J-M.	T-O.	4,87	4,88	4,52	4,37	1,95	2,02	1,09	1,9	34,48	32,7	32,04	29,62	16,25	15,31	16,4	15
3	B- A.	J-Sh.	T-Z.	X-M.	4,68	4,43	4,26	4,08	2,03	1,76	2,11	1,91	31,61	30,2	28,97	32,16	15,27	15,02	15,03	16,01
4	B-J.	A-N.	E- D.	Ch-A.	4,65	4,48	4,61	4,79	2,1	1,9	1,92	2,23	32,08	30	30,86	30,54	15,39	14,65	15,43	16,05
5	P-M.	F-O.	T-J.	A-B.	4,7	4,93	4,51	4,54	2,08	2,1	1,92	2,01	32,29	33,21	30,64	30,84	15,33	16,38	15,01	15,1
6	Ch- S.	E-A.	C- C.	B-O.	4,53	4,25	4,41	4,36	1,9	1,48	1,88	1,9	30,41	30,71	30,28	31,8	14,41	14,9	14,36	14,8
7	D-S.	R-M.	X-A.	M-Sh.	5,2	4,62	4,49	4,18	2,04	1,95	1,96	1,84	39	30,61	30,04	29,58	16,57	14,9	14,88	14,54
8	F-L.	O-D.	F-X.	I-Sh.	4,59	4,65	4,5	4,35	1,98	1,93	1,98	1,96	32,48	32,05	31,76	32,11	14,25	14,85	15,38	16,4
9	U-A.	P-I.	B- A.	S-B.	4,65	4,55	4,53	4,36	1,95	1,95	1,94	1,87	33,64	33,16	30,58	30,17	15,84	15,2	14,24	14,26
10	T- R.	F-A.	N-T.	R-M.	5,01	4,32	4,55	4,56	2,04	1,79	2	1,9	36,2	32	31,3	31,68	16,96	15,2	15,09	15,42
11	P-S.	J-J.	R-A.	M-M.	4,49	5,28	4,2	4,21	1,97	2,05	1,87	1,8	34,65	34,36	30,43	28,94	15,33	16,51	14,75	14,63
12	M-A.	S-N.	Ch-Sh.	R-M.	5	4,41	4,69	4,2	1,99	2	1,9	1,84	35,6	32,11	32,09	31,33	15,4	16,77	15,95	16
∑ Av.					**4,74**	**4,6**	**4,47**	**4,37**	**2,00**	**1,89**	**1,87**	**1,97**	**33,58**	**31,92**	**30,89**	**31,2**	**15,42**	**15,43**	**15,13**	**15,26**

The average result according to the standards is given in Table 1 which expressed in histogram 1 for each age group. Where marked: high scores of 17-year-old footballers in "30-meter speed"; it is noted that the highest results according to the standards are "10-meter speed", in "shuttle running 5x30m", "8" 16-year-old players.

Histogram 1: The average standard, running 10 meters from a high start, speed running 30 meters, shuttle running 5x30 m and test "8" for 14-17-year-old players (n = 12 in each age group)



- However, these indicators do not meet the standard level. In the book by Professor I. Koshbakhtiev "Department of Footballers' Training" the following standards are given in the race for 30 meters by age groups:
- Normative indexes in running for 30 meters for players of 15 years old: 4.4-4.45 seconds;
- Normative indicators in running for 30 meters of players of 16 years of age: 4.3-4.2 seconds;
- The standard rate of running for 30 meters for players of 17 years of age: 4.1-4.15 seconds.

From the above results (histogram 1) it can be seen that I. Koshbakhtiev's implementations do not meet regulatory requirements [5].

Research Results and their Comparative Analysis: For 14-year-old players in the "30-meter speed run" without the ball and the "5x30 meter shuttle race" with the ball, the correlation coefficient is r = 0.7. Compared with data of other ages, this is the best indicator r = 0.7, which indicates the presence of a high statistical relationship.

And for 15-year-old players, the result of the indicator is r = 0.6. It can be seen that the average correlation between the general and special speed qualities of 15-year-old football players is lower than that of athletes of 14 years of age.

The 16-year-old football players have r = 0.5. r = 0.5 indicates the existence of a weakly-average statistical relationship. It can be seen that the average correlation between the general and special speed qualities of 16-year-old football players is at a slightly-average level lower than that of athletes of 15 years of age.

The 17-year-old football players have r = 0.08. r = 0.08 indicates the absence of a correlation. However, although the results of a group of 17 summer athletes running 30 meters were higher than other age groups (table 1), we can observe a disproportionate relationship between overall speed and special endurance. And therefore, the correlation between general and special endurance shows a weak statistical result (table 2).

Table 2: In calculating the correlation between the general special and speed qualities of the players, the participants in the standard "high-speed running at 30 meters" -X and "shuttle running 5x30" - Y

	$\overline{X}$ (30m/s running)	$\overline{Y}$ (5x30 m/s shuttle running)	$X_i - \overline{X}$	$Y_i - \overline{Y}$	Xσ	Йσ	r
14 years old	4,74	33,58	0,11	0,09	0,220	2,525	0,7
15 years old	4,60	31,92	0,02	0,01	0,296	1,336	0,6
16 years old	4,47	30,89	0,02	0,07	0,138	0,934	0,5
17 years old	4,37	31,20	-0,02	0,18	0, 195	1,795	0,08

X_i – following the group of each age (n = 12) means one football player.

$\overline{X}$ – on the run for 30 meters on average n = 12.

Y_i – following the group of each age (n = 12) means one football player.

$\overline{Y}$ – in the shuttle run 5x30 meters on average n = 12.

average difference from n = 12 contingent results.

XσваYσ – sigma rate $\overline{X}$и$\overline{Y}$.

r - an indicator of the correlation coefficient.

Conclusions

At the current stage of intensive football - speed, one of the main conditions for organizing the effectiveness of the game quality. In professional football speed quality must be developed from childhood. At present, the world practice is developing more and more new tools and method used in the education of speed quality young football players. Performing technical movements (techniques) at a fast pace (in a high-speed mode) during training shows that the pace of training sessions adapted to the pace of the game. At the same time, modern football emphasizes the fact that a football player, in case of difficult situations during the game, can demonstrate high skill in performing technical moves at high speed.

From the accepted standards (high-speed running for 30 meters further running for 10 meters from a high start, shuttle running 5x30m, as well as the test "8") it is clear that 16-17-year-old players, with high performance, can be traced a weak proportional relationship between the overall high-speed (10 meters and 30 meters) and special endurance (shuttle running 5x30m).

Although, according to the adopted 4 standards, 14-year-old young football players had the lowest results in the group of players aged 14-17, their level of suitable interrelation between general and special endurance turned out to be the highest to other older age groups. From the literature studied during the study, it became known that with age, the process of neurohumoral regulation occurs in the athlete's body, in which, due to an increase in muscle mass, an increase in speed abilities occurs. However, their overall speed quality should be developed in proportion to (commensurate) special endurance. We can observe a similar development at a high growth rate for 14-year-old players (table 2). In measuring the standard of general speed quality "speed running 30 meters", to the standard for measuring special endurance "shuttle running 5x30 meters", they have an optimal correlation equal to r = 0.7.

If we take a group of football players of 16 years of age who, according to the four accepted standards, had the highest results in three, we can observe an average degree of the proportional statistical relationship between the general speed and special endurance (r = 0.5), although they had good results general speed qualities.

Athletes 16-17 years of age do not have enough time to develop special qualities.

Annotation: The article uses speed test physical criteria to analyze the degree of optimal correlation between the general and specific speed physical qualities of players between the ages of 14 and 17. As a result of the analysis of the tests, the age groups with the optimal correlation of general and specific speed quality were identified.

Ethical Clearance: No ethical approval is needed.

Source of Funding: Self

Conflict of Interest: Nil

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